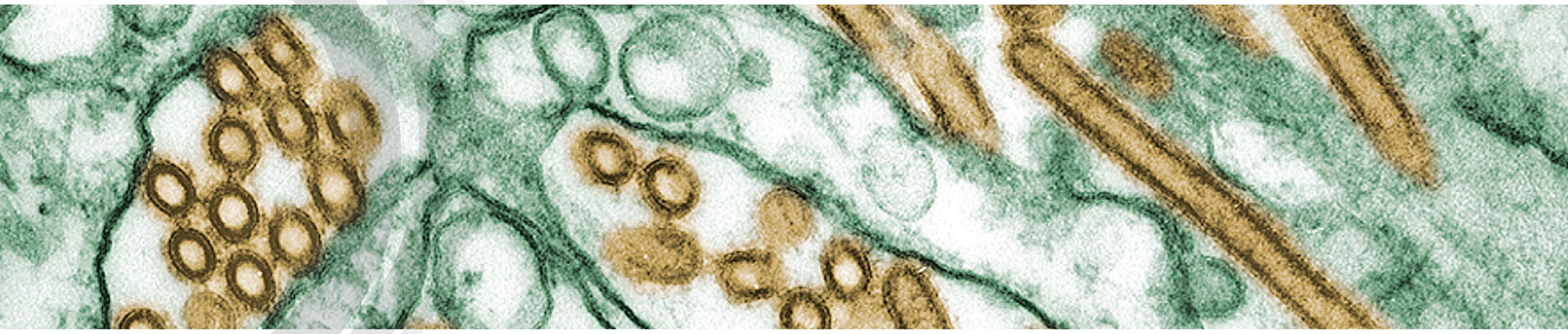
European Centre for Disease Prevention and Control

SURVEILLANCE REPORT



Annual epidemiological report
Reporting on 2011 surveillance data and 2012 epidemic intelligence data

2013

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This report was sent for consultation to National Surveillance Contact Points in the Member States.

Acknowledgements
We would like to acknowledge the contribution of experts in the Member States in supplying the data used for the production of this report, and in reviewing the report draft.

Suggested citation:
European Centre for Disease Prevention and Control.
Annual Epidemiological Report 2013.
Reporting on 2011 surveillance data and 2012 epidemic intelligence data.
Stockholm: ECDC; 2013.

ISBN 978-92-9193-543-7
ISSN 1830-6160
doi 10.2900/13174
Catalogue number TQ-AC-14-001-EN-C

Foreword

As I look through this year's report, two themes occur to me: important progress and continuing challenges.

Let me start by highlighting some important new data in the report. In the section on *Antimicrobial resistance and healthcare-associated infections* you will find results from ECDC's first ever point prevalence survey on healthcare-associated infections and antimicrobial use in European acute care hospitals. This was carried out in 2011 and 2012 in more than a thousand hospitals across 30 European countries. It is the most authoritative and comparable study on this topic ever done in Europe, and I would like to pay tribute to the health professionals in ECDC, the national public health institutes and hospitals across Europe whose work and dedication made it possible. We can now say with some certainty that within the EU's healthcare systems, 3.2 million patients each year catch healthcare-associated infections. Or to put in another way, on any given day in the EU, one in 18 patients in European hospitals is affected by at least one healthcare-associated infection. Many of these infections could have been prevented with better infection control.

The second initiative I would like to highlight is the enhanced European surveillance for the hepatitis B and C viruses, which you will find in the section on *Sexually transmitted infections, including HIV and blood-borne viruses*. This enhanced European level surveillance was introduced in 2010, and it will take some time to deliver good quality information. Nonetheless, we are making important progress towards understanding the burden and guiding prevention and control efforts against these viruses.

Looking at our surveillance data, several of them show progress in the fight against infectious diseases. The reported rate of tuberculosis in the countries covered by this report has continued to decline, albeit more slowly than some would like. Thanks to continuous efforts by Member States to maintain high vaccination coverage, including among population groups who are hard to reach, vaccine-preventable diseases generally showed stable or declining trends. Looking at food- and waterborne diseases, the reported rate of *Salmonella* infections has continued to decline, while the trend in reported rates of *Campylobacter* infections is stable. There are even signs of progress in the fight against one of the most feared multidrug-resistant microbes, meticillin-resistant *Staphylococcus aureus*: the reported percentage of *S. aureus* isolates that are meticillin-resistant is decreasing in several countries and stable in several more.

In among these signs of progress, though, there are a number of less welcome developments. Not all countries are making progress against MRSA and, in any case, ECDC's assessment is that the overall situation of antimicrobial resistance in Europe is getting worse. Of particular concern is the increased prevalence of bacteria (in particular *Klebsiella pneumoniae*) that are resistant to carbapenems, a current last line class of antibiotics against these organisms. Europe also continues to see measles outbreaks, albeit on a lesser scale than the peak levels in 2010. Major public health efforts will be needed if the target of eliminating measles in the European Region by 2015 is to be met. After nearly a decade of declining rates, gonorrhoea and syphilis incidence appears to be again increasing in several countries, while the data on HIV show we still have considerable progress to make in control objectives such as improving access to HIV testing. Despite the efforts of EU level and national public health authorities to promote access to early HIV testing among key risk groups, almost one third of HIV cases reported in 2011 were diagnosed at an advanced stage of infection (CD4 cell counts of less than 200/mm^3). HIV patients diagnosed late are more likely to respond poorly to treatment and to have transmitted infection while being unaware of their HIV status.

Respiratory infections, and particularly influenza, continue to cause a significant burden, especially to older individuals, very young children and subjects with chronic diseases. Vaccination coverage for influenza among those at risk is still suboptimal in many countries. Research for the development of more effective and easier to administer influenza vaccines also remains a high priority.

In autumn 2012 we saw the first few cases in Europe of an emerging respiratory virus that later became known as the Middle East respiratory syndrome coronavirus (MERS CoV). ECDC worked rapidly and intensively to develop a case definition and ensure all Member States had access to testing capacity for this new virus. Just a few months later, in April 2013, we had to undertake the same rapid development work when a new H7N9 avian influenza virus caused over a hundred human cases in eastern China, including more than forty deaths. The emergence of these two novel viruses in the space of just a few months reminds us of the necessity for vigilance and strong international cooperation in the face of new health threats. The fact that the European Parliament adopted the Commission proposal for a Decision on serious cross-border threats to health is therefore very welcome.

As I noted in my foreword to ECDC's previous Annual Epidemiological Report, the EU and EEA countries have made considerable progress in improving the quality and comparability of European data. In 2012, the

European Commission adopted an implementing decision containing agreed EU-level case definitions for all the diseases under European-level surveillance. This was the culmination of several years of hard work by ECDC and its partners in the national public health institutes and is an achievement we should all feel proud of. But I know that reporting according to the previous set of EU case definitions, let alone the new ones, remains a significant challenge for several Member States, where the laboratory diagnostic capacity to test for some of the diseases either does not exist, or is extremely limited. We know that public health budgets continue to be under pressure across Europe, and that in many countries surveillance is not necessarily the top priority. The result is that there are gaps in the European-level data, with some countries simply not reporting data on some diseases. Any such 'blind spots' jeopardise European communicable disease prevention and control and are cause for concern. As the harsh financial climate seems likely to linger on, ECDC and the EU Member States must join forces even more closely in agreeing on the right priorities, complementing each other's activities, and speaking with one voice when communicating public health risks to decision-makers and the general public.

Marc Sprenger
Director

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List of abbreviations and acronyms

AFP	Acute flaccid paralysis
AIDS	Acquired immune deficiency syndrome
AMR	Antimicrobial resistance
ARI	Acute respiratory infection
ATC	Anatomical therapeutic chemical classification
CABG	Coronary artery bypass graft
CCHF	Crimean–Congo haemorrhagic fever
CHOL	Cholecystectomy
CJD	Creutzfeldt–Jakob disease
COLO	Colon surgery
CRI	Congenital rubella infection
CSEC	Caesarean section
CT	Contact tracing
DDD	Defined daily dose
DSN	Dedicated surveillance network
EARS-Net	European Antimicrobial Resistance Surveillance Network
ECDC	European Centre for Disease Prevention and Control
EEA	European Economic Area
EFSA	European Food Safety Authority
EFTA	European Free Trade Association
ELDSNet	European Legionnaires' Disease Surveillance Network
EMA	European Medicines Agency
EMCDDA	European Monitoring Centre for Drugs and Drug Addiction
EPIET	European Programme on Intervention Epidemiology Training
EPIS	Epidemic Intelligence Information System
ESAC	European Surveillance of Antimicrobial Consumption
EU	European Union
Euro-GASP	European Gonococcal Antimicrobial Susceptibility Surveillance Programme
EUROPOL	European Police Office
EuroTB	Surveillance of Tuberculosis in Europe
EUVAC.NET	Surveillance Community Network for Vaccine-Preventable Infectious Diseases
EVD	Emerging and vector-borne diseases
EWGLINET	European Working Group on *Legionella* Infections
EWRS	Early Warning and Response System
FWD	Food- and waterborne diseases
HAI	Healthcare-associated infections
HELICS	Hospitals in Europe Link for Infection Control through Surveillance
Hib	*Haemophilus influenzae* type b
HIV	Human immunodeficiency virus
HPAI	Highly pathogenic avian influenza
HPRO	Hip prosthesis
HUS	Haemolytic uremic syndrome
ICU	Intensive care unit
IDU	Injecting drug user
IHR	International Health Regulations
ILI	Influenza-like illness
IPD	Invasive pneumococcal disease
KPRO	Knee prosthesis
LAM	Laminectomy
LB	Lyme borreliosis
LGV	Lymphogranuloma venereum
LPAI	Low-pathogenic avian influenza
MDR	Multidrug resistance
MMR	Measles-mumps-rubella vaccine
MRSA	Meticillin-resistant *Staphylococcus aureus*
MSM	Men who have sex with men

RASFF	Rapid Alert System for Food and Feed
RRA	Rapid Risk Assessment
RVF	Rift Valley fever
SARI	Severe acute respiratory infection
SARS	Severe acute respiratory syndrome
SARS-CoV	SARS-associated coronavirus
SSI	Surgical site infection
STEC	Shigatoxin-producing *Escherichia coli*
STI	Sexually transmitted infection
TALD	Travel-associated Legionnaires' disease
TB	Tuberculosis
TBE	Tick-borne encephalitis
TESSy	The European Surveillance System
TOM	Treatment outcome monitoring
TTT	Threat Tracking Tool
UI	Urgent inquiries
vCJD	Variant Creutzfeldt–Jakob disease
VHF	Viral haemorrhagic fevers
VPD	Vaccine-preventable disease
VTEC	Verocytotoxin-producing *Escherichia coli*
WHO	World Health Organization
WNV	West Nile virus
XDR	Extensively drug resistant

Country codes

AT Austria
BE Belgium
BG Bulgaria
CY Cyprus
CZ Czech Republic
DE Germany
DK Denmark
EE Estonia
EL Greece
ES Spain
FI Finland
FR France
HU Hungary
IE Ireland
IS Iceland
IT Italy
LT Lithuania
LU Luxembourg
LV Latvia
MT Malta
NL The Netherlands
NO Norway
PL Poland
PT Portugal
RO Romania
SE Sweden
SI Slovenia
SK Slovakia
UK United Kingdom

Summary

Respiratory diseases

The influenza season for the winter of 2011–2012 was late in onset, and the reported intensity of influenza-like illness (ILI) and acute respiratory infection (ARI) mild, or even unusually low, in most countries. This was the first A(H3N2)-dominated winter flu season since 2006–2007, with a usual seasonal flu epidemiology. In contrast to the first pandemic year of 2009, there was no west-to-east geographical progression of infection. A(H3N2)viruses were most prevalent during the winter surveillance period, and B group viruses appeared late in the season. Pandemic viruses (A(H1N1)pdm09) continued to circulate, but in very low numbers. In contrast to the pandemic years, most severe cases occurred among older age groups.

The A(H3N2) viruses showed considerable antigenic diversity, resulting in an imperfect match with the vaccine strain, and relatively low vaccine effectiveness was observed. WHO recommended changing the composition of the next influenza vaccine. Only the Netherlands reported meeting the 75% target for influenza vaccination in people over 65 years, and several countries reported decreased uptake. No resistance to the neuraminidase inhibitor drugs used in prophylaxis and treatment (e.g. oseltamivir, zanamivir) was observed.

No human cases related to avian or swine influenza were detected in Europe in 2012. In the United States over 300 cases, mainly children, were reported. Infections with a new A(H3N2) variant virus were generally mild, contracted through contact with pigs exhibited at agricultural fairs.

A new coronavirus was identified in 2012, closely related to bat coronaviruses, but distinct from the coronavirus responsible for the SARS epidemic in 2003–2003. Nine cases were confirmed during 2012: all were apparently locally acquired in the Saudi Arabian peninsula, had a high fatality rate, but no or very limited transmission to humans. Intermittent zoonotic transmission, or a common environmental source, is thought the likely source of the infection, but this remains conjectural as available epidemiological information is limited. No animal reservoir or mode of zoonotic transmission has been identified.

Tuberculosis (TB) remains an important public health problem in the EU/EEA, with more than 70 000 cases reported annually. TB rates continue to decline at approximately four percent per annum, with most countries reporting decreases over the 2007–2011 period. Seven countries accounted for half of all reported cases in 2011. The epidemiology continues to be characterised by high-incidence countries, reporting a steady decline in rates, and low-incidence countries, reporting increasing numbers of cases in individuals born outside the country.

The proportions of bacteriologically confirmed cases (61%) and successfully treated cases (74%, down from the previous year) remain below the targets specified in the monitoring framework for the EU/EEA. The prevalence of multidrug-resistant tuberculosis (MDR TB) cases, i.e. resistant to both isoniazid and rifampicin, was 4.5%, with 13% of these characterised as extensively drug-resistant, similar to 2010. Only 32% of the MDR-TB cases diagnosed in 2009 completed their treatment successfully by 2011. The prevalence of TB cases with HIV co-infection (4.7%) continues to decline.

Timeliness and completeness of case detection remain priorities, with a particular need to increase the early detection and treatment of multidrug-resistant cases. For some Member States, the sensitivity and quality of surveillance systems remains a challenge. Lack of consistent and adequate information hampers in-depth understanding of TB epidemiology, monitoring of TB programmes at EU/EEA and national levels, appropriate allocation of resources, and ultimately TB prevention and control itself.

Confirmed case rates for Legionnaires' disease decreased compared with 2010, and the five-year trend to 2011 is stable. More than 700 travel-associated cases were reported, and 82 clusters of travel-related cases were identified, nearly half of which were unlikely to have been recognised without coordinated European-level surveillance. Legionnaires' disease is likely to be under-recognised in several Member States, particularly in south-east Europe.

Sexually transmitted infections, including HIV and blood-borne viruses

Chlamydia remains the most frequently reported communicable disease in EU/EEA countries: nearly 350 000 cases were reported in 2011 (rate 175/100 000). The true incidence is likely to be considerably higher due to under-reporting and the asymptomatic nature of the infection. Reporting varies widely across the EU, reflecting not only existing screening and testing practices across countries, but also the diversity in healthcare and reporting systems, including availability of laboratory diagnostic services.

The reported incidence of gonorrhoea and syphilis cases has again started to increase in many countries after nearly a decade of declining rates. Most countries reported increases in rates, primarily among men and among men who have sex with men (where information on risk factors is reported).

HIV infection remains a major public health problem in the EU/EEA countries. The overall reported incidence has stabilised at around 28 000 cases annually (rate 6.3/100 000), but reported rates continue to increase in many countries and vary widely between countries. Almost half of these cases presented late to health services, with initial CD4 cell counts of less than 350/mm^3, including 29% with advanced stage of HIV infection (CD4 cell count <200/mm^3). Further coordinated efforts to improve awareness and early diagnosis are needed in many countries. While the number of AIDS diagnoses reported annually decreased by 33% between 2004 and 2011, the number of persons living with HIV continues to increase, reflecting continuing improvements in access to, and effectiveness of, treatment.

Men who have sex with men comprised the largest group of HIV cases (39%), followed by those who acquired HIV infection through heterosexual contact (23%) and through injecting drug use (5%). Mother-to-child transmission, nosocomial infection, transfusion or other blood products accounted for the remainder of cases. Cases among men who have sex with men increased by 39% between 2004 and 2011, while during the same period a 40% decrease was observed in cases acquired by heterosexual transmission and injecting drug use. However, both Greece and Romania reported large increases in cases among injecting drug users in 2011.

Enhanced surveillance for hepatitis B and C was introduced in EU/EEA countries in 2010, and trends in the reported epidemiology are therefore tentative. In 2011, over 17 000 cases of hepatitis B virus infection were reported by 28 EU/EEA Member States (rate 3.5/100 000), of which acute infections accounted for 16% of cases. Among acute cases, heterosexual transmission (23%), hospital acquired infection (23%), injecting drug use (13%) and transmission among men who have sex with men (10%) were the most frequently reported modes of transmission. Mother-to-child transmission was most commonly reported (67%) for chronic cases. More than 30 000 cases of hepatitis C were reported in 2011 (rate 7.9/100 000). However, the great majority of these are thought to be chronic infections. Injecting drug use accounted for 78% of all cases in 2011 where transmission route was reported.

Food- and waterborne diseases

Campylobacter and *Salmonella* infections remain the most commonly identified gastrointestinal diseases in EU/EEA countries. The trend in *Campylobacter* reported rates is stable; most cases are sporadic, although many small outbreaks are reported. Poultry meat was again the most frequently identified outbreak vehicle in reported outbreaks in 2011. Waterborne outbreaks were also reported from Belgium and Finland. The reported incidence of *Salmonella* infection has been declining steadily since 2004, related to improved infection control programmes in the poultry industry. A significant minority of cases (about 12%) are acquired through overseas travel. *Salmonella* also continues to be the source of many outbreaks, both within and between countries. Four multinational outbreaks were identified in 2012; an outbreak of *Salmonella* Stanley infection involved 682 known cases across ten countries.

The parasitic diseases, giardiasis and cryptosporidiosis, remain the third and fifth most commonly reported gastrointestinal infections in Europe, even though they are particularly subject to under-diagnosis and underreporting in many Member States. An unexplained increase in *Cryptosporidium* infections occurred concurrently in four countries during the late summer of 2012.

Rates of confirmed Shiga toxin/verocytotoxin-producing *Escherichia coli* (STEC/VTEC) increased two and half fold due to the large outbreak centred in Germany in 2011. This was due to a rare strain of STEC O104:H4 related to consumption of contaminated sprouts. European food hygiene legislation has been amended as a result of this outbreak. Epidemiology of the more usual STEC/VTEC strains was broadly similar to that of 2010.

A number of gastrointestinal infections are a particular burden for certain countries and regions within the EU. Brucellosis was reported mainly from Portugal, Spain and Greece, associated primarily with goat farming; most trichinellosis cases were reported from Bulgaria, Romania and Lithuania, which may be associated with consumption of domestically reared pork and wild boar; most confirmed echinococcosis cases were reported from Bulgaria. Yersiniosis is often associated with consumption of infected pork, and case rates remain high in Finland, Lithuania, Estonia, Luxembourg, Germany, the Czech Republic and Slovakia. Hepatitis A remains the fourth most commonly reported gastrointestinal infection in the EU/EEA area, and rates remain particularly high in Estonia, Slovakia, Romania and Bulgaria.

Typhoid and paratyphoid fever, and cholera, are uncommon diseases in EU/EEA countries; their occurrence reflects patterns of travel to countries where these diseases are endemic. The majority of shigellosis cases in the EU/EEA area were also acquired through foreign travel.

Anthrax remains a rare disease in EU/EEA countries. However, outbreaks of cases among people who inject drugs again occurred in late 2012, in four countries. Anthrax outbreaks in this group were first identified in Europe in 2010.

Emerging and vector-borne diseases

Vector-borne diseases remain a significant burden for Member States. Most are imported infections, with the epidemiology reflecting the pattern of travel to countries where these diseases are endemic. Malaria rates remain stable, while reported rates for dengue fever and chikungunya have decreased from the increased levels seen in 2010.

These imported infections are not normally transmissible from person to person in the European context. However, there is an apparent increasing risk of indigenous disease transmission becoming established in some countries where vectors are present. For the fourth consecutive year, Greece reported local transmission of malaria; sixteen cases with no travel history were identified in Greece up to November 2012. Local transmission of dengue was reported from France and Croatia in 2010, but not in 2011. In 2012, a major outbreak with over 2 000 cases was reported from Madeira, Portugal, attributed to the *Aedes aegypti* mosquito, the main vector of dengue worldwide. Local transmission of chikungunya has been previously reported from Italy (2007) and France (2010), but not subsequently.

West Nile fever is becoming established in some south-eastern Member States, with over 200 cases reported in 2012 from Greece, Italy, Romania and Hungary, and more than 600 from countries bordering the EU. Case numbers had decreased in 2011 but increased again in 2012. Four EU countries have now been affected for several consecutive years, and the geographic distribution in affected countries has widened. Some of the increase in reported cases may be due to the implementation of improved surveillance in affected countries. Human cases were detected for the first time in 2011 in the former Yugoslav Republic of Macedonia, and in 2012 in Croatia, Kosovo[i], Serbia and in Montenegro.

Q fever case rates have returned to the expected low levels, thanks to the resolution of the major outbreak in the Netherlands. Hantavirus infections remain the most commonly reported of the viral haemorrhagic fevers, with the highest rates reported from Finland in 2011. Other forms of viral haemorrhagic fever were reported rarely, as sporadic imported cases, or not at all, in 2011. No cases of plague, smallpox, SARS or yellow fever were reported by Member States in 2011 or 2012.

Vector-borne diseases in the European context pose a continuing and increasing public health risk. Locally acquired cases are continuing to occur of diseases previously considered to be only imported, in particular malaria, dengue fever and chikungunya. The outbreak in Madeira is the first major outbreak of dengue fever in recent history in an EU country, and illustrates the potential for local transmission where competent insect vectors are present. Dengue and chikungunya in particular have similar outbreak potential in EU countries where the relevant vectors are established. West Nile virus must now be considered endemic in south-east Europe. Coordinated and enhanced human, environmental and/or veterinary surveillance is needed in all Member States at risk of these diseases, together with development of effective response measures.

Vaccine-preventable diseases

Reported measles rates declined in 2011 and 2012 from the peak levels in 2010, but this is thought to reflect the periodicity of measles outbreaks rather than a stable decline in the burden of disease. Further peaks in infection are expected unless effective interventions to increase vaccine coverage are achieved by several Member States. Elimination of indigenous transmission of measles by 2015 remains a major challenge for the European Region.

Most other vaccine-preventable diseases under EU-level surveillance continued to show either a declining or stable trend in reported cases. Among the primary vaccine schedule diseases, diphtheria cases remain rare, confined to a very few cases across six countries. Tetanus remains rare, with a few cases reported by several countries; Italy was an exception with 57 cases. No cases of polio were reported in 2010.

Invasive bacterial diseases infections caused by *Neisseria meningiditis* and *Haemophilus influenzae* remained uncommon in most countries, and stable in trend, reflecting gains from previous Group C vaccine introduction. There has also been some concomitant reduction in B group cases of meningococcal disease. However, rates remain high in some countries without vaccination programmes. Group B vaccines are becoming available, and effective surveillance is important to support decisions relating to their introduction. Invasive pneumococcal disease is more frequently reported, and rates are increasing, but this may be due to improvements in surveillance systems in some countries. Pneumococcal conjugate vaccines have generally proved effective, but reported increases in non-vaccine serotypes are a concern, and consistent surveillance across Europe is needed.

Mumps case rates in 2011 were similar to 2010, and the decline since the peak in 2009 has been maintained. Many cases are in young adults who have acquired the infection despite having received at least one dose of mumps-containing vaccine in childhood: waning vaccine immunity appears to be an issue for mumps control. Rubella case rates remain low, compared with the peaks of 2007 and 2008, although Poland and Romania reported large outbreaks in 2011 and 2012. The epidemiology of rubella is difficult to assess due to differences in surveillance systems and reporting, and particularly low rates of laboratory confirmation of cases.

Pertussis remains a relatively common and under-diagnosed infection; reported rates appear to be increasing after a decline in 2009–2010, due to significant reported increases in a few countries, particularly the Netherlands, Spain, United Kingdom, Poland and Finland. Pertussis is increasingly reported, and often unrecognised, among older children, adolescents, and adults, representing a risk of infection for vulnerable younger children.

Antimicrobial resistance and healthcare-associated infections

The antimicrobial resistance situation continues to vary considerably across EU/EEA countries, depending on the antimicrobial agent, microorganism concerned and geographical region. With some exceptions, surveillance continues to show a deteriorating situation. The percentage of resistant isolates is higher in south and south-eastern Member States for most microorganism and antimicrobial agents.

i This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

The increase in antimicrobial resistance observed in *Escherichia coli* and *Klebsiella pneumoniae* isolates over recent years continued in 2011. Of particular concern is the increased percentage of *K. pneumoniae* resistant to carbapenems, current last-line antibiotics against these bacteria. In contrast, the percentage of meticillin-resistant *Staphylococcus aureus* (MRSA) isolates appears stable, and seems to be decreasing in some countries. However, MRSA remains a public health priority, as the percentage of MRSA continues to be high in several countries, especially in southern Europe.

ECDC coordinated the first European point prevalence survey of healthcare-associated infections (HAIs) and antimicrobial use in acute care hospitals in 2011 and 2012. More than 1 000 hospitals in 30 countries (27 Member States, Croatia, Iceland and Norway) participated in the survey. The overall prevalence of patients with at least one HAI on any given day was estimated at 5.7%. The most frequent HAIs were pneumonia and lower respiratory tract infections, surgical site infections, urinary tract infections and bloodstream infections. HAI prevalence was the highest in patients admitted to intensive care units, where 19.5% patients had at least one HAI. The prevalence of patients receiving at least one antimicrobial agent on any given day in European hospitals was estimated at 32.7% and was also the highest in patients in intensive care units (56.5%) and the lowest in psychiatric patients (3.5%).

Surveillance of surgical site infections and HAIs in intensive care units continued in 2011. The incidence of surgical site infections has decreased over the period 2008–2011 for some procedures while remaining unchanged or increased for others. A substantial proportion of surgical site infections were only detected through surveillance after hospital discharge. Rates for infections acquired in intensive care units (pneumonia, bloodstream infections and urinary tract infections) remained stable in 2011 compared with 2010, although infections due to Gram-negative bacteria were more frequent in 2011.

The median consumption of antibacterials ('antibiotics') for systemic use in the community (i.e. outside hospitals) was 19.0 defined daily doses (DDD) per 1 000 inhabitants per day, ranging from 11.4 (the Netherlands) to 34.9 (Greece).

The overall median consumption from reporting countries has increased slightly, from 18.4 (2007) to 19.0 (2011) DDD per 1 000 inhabitants and per day. Consumption of antibacterials for systemic use in the hospital sector ranged from 1.0 to 3.4 DDD per 1 000 inhabitants per day.

Antimicrobial resistance is a major and overall deteriorating public health problem that requires international cooperation, as well as increased efforts at national level. Continued progress is needed on prudent use of antibiotics in community and hospital settings, and in the implementation of improved integrated programmes for the prevention and control of antibiotic-resistant bacteria and HAIs. Participation in the European surveillance network can add awareness and impetus to hospital-based programmes to prevent and control HAIs. Surveillance of antimicrobial consumption is an important indicator to support professionals and decision-makers to monitor progress toward a more prudent use of antibiotics.

Surveillance challenges

A number of diseases remain particularly subject to under-diagnosis and underreporting, complicating efforts to understand their occurrence and burden, and develop appropriate public health interventions. These include parasitic diarrhoeal diseases, such as giardiasis and cryptosporidiosis, for which laboratory diagnostic services are not routinely available in a number of countries. In addition, some diseases remain not under surveillance or routinely reported to EU level by some Member States. These include several responsible for a considerable burden of infection, ranging from campylobacteriosis and pertussis to gonorrhoea and malaria. For other diseases, reporting according to the agreed EU case definitions remains a significant challenge for some Member States.

Event surveillance at national and European level continues to be a critical means for rapid detection and control of communicable diseases in the EU. ECDC continues to develop its epidemic intelligence and threat assessment tools and procedures. The rapid and appropriate use of EWRS and dedicated information networks by Member States remains a cornerstone of early warning and response to communicable disease threats.

Table A. Overview of the number of reporting countries, reported cases, EU notification rates and Member States notification rates range, by disease, 2011

Disease	Cases[1]	Number of reporting countries[2]	Number of reported cases[2]	EU notification rate[3] (per 100 000)	Member States notification rates (range)[3]	
					Minimum	Maximum
AIDS	CONF	26	4424	0,90	2,80	4,80
Anthrax	CONF	27	6	0,00	0,00	0,02
Botulism	CONF	27	112	0,02	0,00	0,09
Brucellosis	CONF	26	330	0,07	0,00	0,81
Campylobacteriosis	CONF	25	215 252	69,73	0,31	177,95
Chikungunya fever	TOTAL	22	55	0,01	0,00	0,07
Chlamydia trachomatis infection	CONF	23	322 290	166,47	0,20	478,67
Cholera	CONF	26	35	0,01	0,00	0,04
Congenital syphilis	CONF	20	87	0,02	0,00	0,52
Crimean–Congo hemorrhagic fever	TOTAL	21	4	0,00	0,00	0,05
Cryptosporidiosis	CONF	21	5697	1,96	0,00	9,04
Dengue fever	TOTAL	22	610	0,13	0,00	1,09
Diphtheria	CONF	26	18	0,00	0,00	0,24
Ebola and Marburg virus	TOTAL	24	0	0,00	0,00	0,00
Echinococcosis	CONF	25	781	0,18	0,00	4,09
Giardiasis	CONF	21	16 207	5,50	0,00	26,10
Gonorrhoea	CONF	26	38 779	12,69	0,39	37,09
Hantavirus	TOTAL	23	2884	0,65	0,00	34,12
Hepatitis A	CONF	27	12 636	2,54	0,00	74,45
Hepatitis B virus infection	CONF	26	16 488	3,40	0,20	14,20
Hepatitis C virus infection	CONF	24	28 625	7,50	0,20	54,60
HIV	CONF	27	28 038	5,70	0,90	27,30
Invasive *haemophilus influenzae* disease	CONF	27	2046	0,37	0,00	2,04
Invasive meningococcal disease	CONF	27	3776	0,75	0,10	1,95
Invasive pneumococcal disease	CONF	25	19 498	3,63	0,30	16,62
Lassa fever	TOTAL	23	0	0,00	0,00	0,00
Legionnaires' disease	CONF	27	4881	0,97	0,00	2,21
Leptospirosis	CONF	27	526	0,11	0,00	0,46
Listeriosis	CONF	26	1493	0,31	0,04	0,88
Lymphogranuloma venereum	CONF	15	697	0,31	0,00	0,66
Malaria	CONF	25	5452	0,94	0,02	2,70
Measles	TOTAL	27	32 084	6,40	0,00	23,04
Mumps	TOTAL	25	12 346	3,59	0,00	27,51
Pertussis	TOTAL	26	15 338	4,37	0,03	35,67
Plague	CONF	26	0	0,00	0,00	0,00
Poliomyelitis	CONF	27	0	0,00	0,00	0,00
Q-fever	CONF	24	759	0,19	0,00	0,60
Rabies	CONF	27	1	0,00	0,00	0,00
Rift Valley fever	TOTAL	17	0	0,00	0,00	0,00
Rubella	TOTAL	23	8409	2,49	0,00	18,26
Salmonellosis	CONF	27	95 548	20,36	1,64	80,69
Severe acute respiratory syndrome	CONF	27	0	0,00	0,00	0,00
Shigellosis	CONF	26	7158	1,59	0,03	10,63
Smallpox	CONF	26	0	0,00	0,00	0,00
Syphilis	CONF	27	19 666	4,98	1,49	11,04
Tetanus	TOTAL	25	148	0,04	0,00	0,15
Toxoplasmosis	CONF	19	29	1,01	0,00	2,06
Trichinellosis	CONF	26	268	0,06	0,00	2,24
Tuberculosis	TOTAL	27	71 964	14,30	4,30	89,70
Tularaemia	CONF	24	544	0,12	0,00	3,72
Typhoid/paratyphoid fever	CONF	25	1129	0,26	0,00	0,84
Variant Creutzfeldt–Jakob disease	CONF	10	2	0,00	0,00	0,00
Vero/shiga toxin-producing *Escherichia coli* infection	CONF	26	9485	2,57	0,00	6,80
West Nile fever	TOTAL	23	131	0,04	0,00	0,88
Yellow fever	CONF	27	0	0,00	0,00	0,00
Yersiniosis	CONF	24	6981	2,20	0,00	11,40

[1] CONF – confirmed cases; TOTAL – total cases reported
[2] Based on cases from comprehensive and sentinel systems
[3] Based on cases from comprehensive systems

1 Introduction

1.1 A note to the reader

The Annual Epidemiological Report 2013 gives an overview of the epidemiology of communicable diseases of public health significance in Europe, drawn from surveillance information from countries on the communicable diseases and health issues for which surveillance is required in the European Union (EU) and European Economic Area (EEA) countries[i,ii].

The report gives an outline descriptive of the epidemiology for each disease, in a standard format, covering the years 2007–2011, based on surveillance data submitted to The European Surveillance System (TESSy) by 27 EU Member States[iii] and three EEA countries (Iceland, Liechtenstein, Norway). In addition, updates from epidemic intelligence in relation to emerging public health threats for 2012 are given, both by disease as relevant, and in a dedicated section (Chapter 3). Information on these is either directly reported to ECDC by means of Member State notifications through the Early Warning and Response System (EWRS), according to defined criteria[iv], or discovered through active screening of various sources, including national epidemiological bulletins and international networks, and additional formal and informal sources.

This surveillance report is produced annually and is intended for policymakers and health sector leaders, epidemiologists, scientists and the wider public. It is hoped that readers will find this compilation a useful one-volume overview and reference to better understand the present situation in relation to communicable diseases in Europe. Together with other disease-specific reports, it should also usefully assist policymakers and health leaders in making evidence-based decisions to plan and improve programmes, services and interventions for preventing, managing and treating these diseases.

In-depth reviews of the epidemiology of particular diseases (e.g. tuberculosis, HIV) or disease groups (e.g. food- and waterborne diseases) are published separately, sometimes in collaboration with other European agencies or the World Health Organisation Regional Office for Europe. These are referenced with the description of each disease. In addition, further information relating to most of the diseases reported here is available on the ECDC website health topics pages.

i Commission Decisions 2000/96/EC, 2003/534/EC and 2007/875/EC of the Parliament and of the Council.

ii Commission Decision 2119/98/EC of the Parliament and of the Council of 24 September 1998 setting up a network for the epidemiological surveillance and control of communicable diseases in the Community. 1998, Official Journal of the European Union. p. L 268.

iii Croatia joined the EU in 2013, and data will be included in surveillance reports from 2014.

iv Commission Decision of 10 July 2009 amending Decision No 2000/57/EC on the early warning and response system for the prevention and control of communicable diseases under the Decision No 2119/98/EC of the European Parliament and of the Council, in Official Journal of the European Union. 2009. p. L 181: 57-9.

The reader will appreciate that surveillance systems capture only a proportion of the cases actually occurring: some cases of disease remain undiagnosed (under-ascertainment), and some are diagnosed but not reported to public health authorities (underreporting). The pattern of this under-ascertainment and underreporting varies by disease and country, being a complex mix of healthcare-seeking behaviour, access to health services, availability and use of diagnostic services, reporting practices by doctors and others, and the operation of the surveillance system itself.

For these reasons the direct comparison of disease rates between countries should be undertaken with caution. The reader should be aware that in most cases, differences in case rates reflect not only differences in the occurrence of the disease, but also systematic differences in health and surveillance systems outlined above.

Each annual report, however, continues to evidence the improvements in the harmonisation of systems and reporting at Member State and EU levels. Nevertheless, data provided by the Member States continue to show a number of inconsistencies. In several situations, the quality and comparability of the data are not ideal, and work continues to improve this situation.

This report aims to be consistent with earlier ECDC surveillance reports which relate to specific diseases and disease groups. However, Member States update their surveillance reports to ECDC continually, and a number have made specific additions and amendments for this report, including corrections to data reported for earlier years. Accordingly, some minor differences may be seen when comparing the data in this report to previous annual epidemiological reports and disease programme reports.

1.2 Structure of the report

The *Summary* gives an overview of the main findings from the disease-specific chapters.

Chapter 1 outlines the methods used for receiving, validating and analysing surveillance data from the 27 EU Member States and three EEA countries, including discussion of the value and limitations of the present surveillance information.

Chapter 2 gives an overview of the epidemiological situation in 2011 for each of the communicable diseases and health issues under surveillance in the EU/EEA countries, with updates from epidemic intelligence for 2012 as relevant.

Chapter 3 gives an overview of the threats monitored through epidemic intelligence during 2012, with emphasis on some threats of particular interest, either because of their public health importance or of unusual or new epidemiological patterns.

1.3 Description of methods

Data sources: indicator surveillance (disease cases)

All EU Member States and three EEA countries (Iceland, Liechtenstein and Norway) send information at least once a year from their surveillance systems to ECDC. These data relate to the occurrence of communicable diseases and health issues under mandatory EU-wide surveillance[2]. Reports are sent according to case definitions established by the EU[V].

Member States upload data to ECDC's TESSy database throughout the year. In conjunction with annual ECDC reports for particular diseases or disease groups and this overall annual report, ECDC issues 'data calls', with specified end dates, to ensure the accurate and timely submission of data for the previous calendar year. In addition, Member States can update and correct their own data at any time; alterations are made only by designated country experts.

The information submitted by Member States to ECDC is defined through a 'meta-dataset' for each disease under surveillance. The meta-dataset includes the case classification for the disease (particularly whether the case is confirmed or probable) according to case definitions for the diseases as determined by the Commission. It also defines the information items to be included with each case report. Most data is submitted as anonymised individual case data, but some Member States report aggregated data for some diseases. Active zero case reports are required for some diseases.

Data are uploaded and validated by Member States using ECDC's online (TESSy) system for the collection of surveillance data. Designated country information specialists transform the data in their surveillance systems into an appropriate format before uploading to TESSy. Automatic validation for defined errors is part of the TESSy system, and system reports allow Member States to review uploaded data and make corrections. Additional data validation is conducted by ECDC epidemiologists, in liaison with designated disease experts and epidemiologists in Member States. Corrections to country data are done only by the designated country information specialists. Once the draft report is produced, it is sent to the national surveillance coordinators for final validation. Any final corrections are uploaded to TESSy.

For each disease under surveillance, TESSy holds a description of the key attributes of the surveillance systems for that disease in each Member State. This information is included in the report to aid the interpretation of surveillance data for each reported disease. Member States are asked to verify and update this information each year.

For the present report, data were drawn from two sources:

- Data calls by ECDC Disease Programmes for annual reports on the enhanced surveillance of specific diseases or disease groups.
- For all other diseases, data were submitted in response to a data call issued specifically for this report.

Data sources: event surveillance

Chapter 3 presents information relating to health threats identified by ECDC through epidemic intelligence activities, from both formal and validated informal sources. These threats are documented and monitored using a dedicated database, the Threat Tracking Tool (TTT). Data presented in this report are extracted from the TTT and the EWRS database. The analysis of monitored threats covers the period from the activation of TTT in June 2005 until the end of 2012; EWRS entries are covered from January 2005 up to year-end 2012.

The expression 'opening a threat' refers to the way ECDC assesses threats during its daily threat review process. ECDC experts evaluate potential communicable disease threats and validate events that require further attention or potential action from ECDC, based on their relevance to public health or the safety of EU citizens. The following criteria are used to 'open a threat' and further monitor an event:

- More than one Member State is affected.
- A disease is new or unknown, even if there are no cases in the EU.
- There is a request from a Member State or from a third party for ECDC to deploy a response team.
- There is a request for ECDC to prepare a rapid risk assessment of the situation.
- There is a documented failure in an effective control measure (vaccination, treatment or diagnosis).
- There is a documented change in the clinical/epidemiological pattern of the disease, including changes in disease severity, the way of transmission, etc.
- The event meets any of the criteria under the International Health Regulations (IHR) or EWRS.

Events are considered appropriate to be reported to the EWRS if one or more of the criteria below are met. After the revised International Health Regulations (IHR) entered into force in 2007, the Commission Decision relating to the early warning and response system was amended, and criteria now include both IHR notifications and the need to exchange details following contact tracing[VI].

v Commission Decision 2002/253/EC of 19 March 2002 laying down case definitions for reporting communicable diseases to the Community network under Decision No 2119/98/EC of the European Parliament and of the Council (notified under document number C(2002) 1043)

vi Commission Decision of 10 July 2009 amending Decision No 2000/57/EC on the early warning and response system for the prevention and control of communicable diseases under the Decision No 2119/98/EC of the European Parliament and of the Council, in Official Journal of the European Union. 2009. p. L 181: 57-9.

The following criteria are applied for reporting to the EWRS:

- Outbreaks of communicable diseases extending to more than one EU Member State.
- Spatial or temporal clustering of cases of a disease of a similar type if pathogenic agents are a possible cause and there is a risk of propagation between Member States within the Union.
- Spatial or temporal clustering of cases of disease of a similar type outside the EU if pathogenic agents are a possible cause and there is a risk of propagation to the Union.
- The appearance or resurgence of a communicable disease or an infectious agent which may require timely coordinated EU action to contain it.
- Any IHR notification (also reported through EWRS).
- Any event related to communicable diseases with a potential EU dimension necessitating contact tracing to identify infected persons or persons potentially in danger, which may involve the exchange of sensitive personal data of confirmed or suspected cases between concerned Member States.

Data analysis

General principles

Analyses are based on confirmed cases where possible. For some diseases (e.g. tuberculosis, Legionnaires' disease), cases are defined on a specific basis, as described in the relevant sections. Cases are date-stamped based on the date that the country chooses as its preferred date for reporting. This could be either date of onset of disease, date of diagnosis, date of notification, or some other date at the country's discretion.

Population data

Population data are obtained from Eurostat[VII]. Data for rates calculations are extracted from the Eurostat database 'Demographic balance and crude rates' (DEMO_GIND). Annual population data are as of 1 January of each year. Totals per year and per country were available for all countries for 2011. For calculation of age- and gender-specific rates, data are aggregated into the following age groups for analysis: 0–4, 5–14, 15–24, 25–44, 45–64 and ≥65 years.

Presentation of analyses

The descriptive epidemiology for each disease is set out as a summary table by country and supplementary figures. These include the trend for reported confirmed cases from 2007–2011, age- and gender-specific rates, and occurrence by month ('seasonality'), if relevant. Additional graphs, figures and maps are used as appropriate to illustrate other important aspects of the disease epidemiology in the EU/EEA.

Summary table

The summary table for each disease indicates whether the country data were reported from a surveillance system with national or a sub-national geographical area of coverage. The table also indicates whether the data submitted are case based (C) or aggregated (A) and presents an overview of the number and rates (crude and age-standardised) of confirmed cases reported by the Member States surveillance systems for the period 2007–2011. The 'total' number of reported cases (independent of case classification) for 2011 is also shown. For certain diseases (in the emerging and vector-borne, and vaccine-preventable disease sections), numbers and rates are given only for 'total' cases.

Confirmed case rates ('crude rates') are given per 100 000 persons (the number of reported confirmed cases divided by the official estimate of the population for that year multiplied by 100 000). Countries that made no report for a disease are excluded from the calculation for overall European rates for that disease. Country reports from systems with less than national coverage (e.g. where only some regions of the country report nationally) are also excluded from calculation of overall EU case rates.

Age-standardised rates (ASRs) are presented to facilitate comparisons between countries. Crude rates can be misleading if comparisons are made across countries which differ with respect to certain underlying population characteristics, including age structures. The ASR shows what the country rates would be if all countries had the same underlying age structure (see Table 1.1 below). ASRs were calculated using the direct method and are presented when the overall crude EU/EEA rate exceeds 1/100 000 population. ASRs are also given per 100 000 persons.

ASRs are calculated according to the following formula:

$$ASR = \frac{\sum_{i=1}^{6} (r_i p_i)}{\sum_{i=1}^{6} p_i}$$

where r_i is the age-group specific rate for age group i in the population being studied, and p_i is the population of age group i in the standard population.

The standard population used in this report was based on the average population of the 27 Members States structure for the period 2000–2010 (Table 1.1). This standard population was defined to reflect the current age structure of EU/EEA countries.

vii Eurostat is the statistical office of the European Union.

Table 1.1. Standard European mean population 2000–2010 used for calculation of age standardised rates

Age group	Standard population
<5	25 511 619
05–14	54 360 128
15–24	62 554 451
25–44	143 870 299
45–64	123 751 489
≥65	81 297 013
Total	**491 344 999**

Aspects of descriptive epidemiology at EU/EEA level

The descriptive epidemiology reported for each disease for the EU and EEA region overall is described as follows:

- **Trends in reported number of confirmed cases.** The number of confirmed cases by month, 2007–2011, for the EU/EEA is presented as a figure. The figure also shows a centred 12-month moving average to present the overall trend (seasonal and random variation have been largely smoothed out).
- **Age- and gender-specific rates for confirmed cases.** Age- and gender-specific rates for the EU/EEA Member States are presented per 100 000 persons. It should be noted that these analyses are based only on cases for which both age and gender were reported. For some diseases this can result in exclusion of a significant proportion of cases, and the overall EU and EEA rate will be underestimated. The denominator includes the sum of the populations within the respective age-gender groups, including countries which actively reported zero cases.
- **Seasonal distribution of cases.** For diseases which show seasonal variation in reported occurrence, a figure is presented showing the total number of confirmed cases reported for each month in 2011, compared with the maximum, minimum and average number of cases observed for each month for the period 2007–2010. These analyses include only cases for which the month of reporting is given; again, for some diseases this can result in exclusion of significant numbers of cases.

It should be noted that for some diseases reported numbers are too small for some or all of the above analyses to be presented.

Data protection

The data submitted by Member States to TESSy are subject to Regulation (EC) No 45/2001 of the European Parliament and of the Council of 18 December 2000, providing for 'the protection of individuals with regard to the processing of personal data by the Community institutions and bodies, and on the free movement of such data.' High standards of data protection consistent with these requirements are applied, supervised by the ECDC Data Protection Officer (DPO). ECDC data protection arrangements are also subject to review by the European Data Protection Supervisor.

Restricted specified data is made available, on request, to other European Agencies, institutions and approved research organisations, under policies and procedures in accordance with the above requirements, and approved by the ECDC Management Board.

2 Epidemiology of communicable diseases in Europe, 2011

This chapter is sub-divided into the following main disease groups:

2.1 Respiratory tract infections
Seasonal/pandemic influenza and human infection with animal influenza viruses, Legionnaires' disease, SARS, tuberculosis.

2.2 Sexually transmitted infections
Chlamydia trachomatis infection, gonorrhoea, hepatitis B, hepatitis C, HIV and syphilis.

2.3 Food- and waterborne diseases and zoonoses
Anthrax, botulism, brucellosis, campylobacteriosis, cholera, cryptosporidiosis, echinococcosis, infection with VTEC/STEC, giardiasis, hepatitis A, leptospirosis, listeriosis, salmonellosis, shigellosis, toxoplasmosis, trichinellosis, tularaemia, typhoid/paratyphoid, variant Creutzfeldt–Jakob disease and yersiniosis.

2.4 Emerging and vector-borne diseases
Malaria, plague, Q fever, smallpox, viral haemorrhagic fevers (including hantavirus, Crimean–Congo haemorrhagic fever, dengue fever, Rift Valley fever, Marburg and Ebola virus, Lassa fever and chikungunya), West Nile fever and yellow fever.

2.5 Vaccine-preventable diseases
Diphtheria, invasive *haemophilus influenzae* disease, invasive meningococcal disease, invasive pneumococcal disease, measles, mumps, pertussis, poliomyelitis, rabies, rubella and tetanus.

2.6 Antimicrobial resistant pathogens and healthcare-associated infections
Antimicrobial resistance, antimicrobial use and healthcare-associated infections.

For more general information about each communicable disease please refer to *Health Topics A–Z* on the ECDC website at www.ecdc.europa.eu.

An alphabetical list of diseases and special health issues is given overleaf, for ease of reference.

Alphabetical list of diseases and special health issues

2.1 Respiratory tract infections

Influenza

- Compared with the two previous seasons, the 2011–2012 influenza season in Europe started late, showed no clear geographic progression, and its intensity was lower in most EU/EEA countries.
- A(H3) virus was dominant, with B viruses taking over late in the season. Compared with previous seasons, the proportion of A(H1N1)pdm09 was very low (2%).
- An imperfect match between the A(H3) vaccine strain and the circulating strains caused a reduced vaccine effectiveness and required changing the composition of the subsequent influenza vaccine (2012–13).
- No reduced susceptibility to neuraminidase inhibitors was observed.
- Most of the hospitalised severe influenza cases reported by six countries were observed in the youngest and the oldest age groups.
- The excess mortality from all causes observed in the elderly in 12 countries may have been related to influenza, although a concomitant cold spell in Europe may also have contributed.
- In the United States, a new variant of A(H3N2) was detected, mainly among children attending fairs where pigs were exhibited. This virus of swine origin did not cause severe disease in healthy children.
- A novel coronavirus emerged in 2012 and was associated with some severe lower respiratory tract infections in Europe.

Influenza is an acute respiratory disease caused by human influenza viruses. While most cases recover quickly, seasonal epidemics of influenza cause substantial levels of severe illness and deaths, particularly among older persons and those with underlying medical conditions. In addition, the large extent of milder and more moderate disease results in a considerable social and economic burden and pressure on health services. Type A viruses cause the most severe disease and are associated with epidemics and pandemics, but B viruses also contribute to the annual epidemics. Continuing changes in the genetic makeup of influenza viruses lead to the development of virus strains that escape prior human immunity and so are more effective in causing epidemics. Occasionally, novel strains develop to which many humans have little or no immunity, and worldwide pandemics occur, as happened last in 2009. The most important countermeasure is seasonal influenza immunisation applied annually to those at highest risk of experiencing severe disease[1]. The match between vaccine and circulating strains, field effectiveness and coverage are monitored on a regular basis. An early risk assessment is undertaken annually in-season[2] while the overall season is reviewed retrospectively in the *Annual Epidemiological Report*.

Epidemiological situation (week 40/2011 to week 20/2012)

In comparison with the two previous influenza seasons, the 2011–2012 season started late with only five countries reporting medium or higher intensity in week 3/2012 (Figure 2.1.1).

Unlike in many other years, there was no clear geographical progression of influenza activity[3]. However, some countries were affected ahead of others allowing the annual risk assessment to be based on the experience of the countries affected earliest[2]. Influenza-like illness (ILI) and acute respiratory infection (ARI) rates peaked in most of the countries during weeks 8 and 9 (range 5–11) when 19 countries reported regional or widespread activity. Compared with the previous season, the peak was lower in 19 countries and the United Kingdom (England, Northern Ireland and Wales), slightly higher in eight countries and the United Kingdom (Scotland) and similar in Spain. In some countries, for instance in Denmark, the

Figure 2.1.1. Number of EU/EEA countries reporting medium or high intensity of influenza transmission, by week, during the influenza seasons 2009–2010, 2010–2011 and 2011–2012

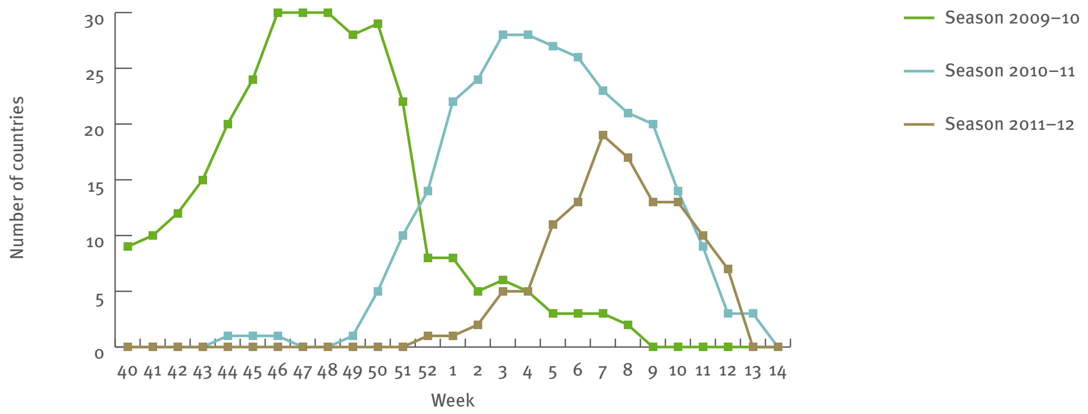


Figure 2.1.2. Distribution of sentinel samples positive for influenza, by week and type, weeks 40/2010–20/2011, EU/EEA (29 countries)

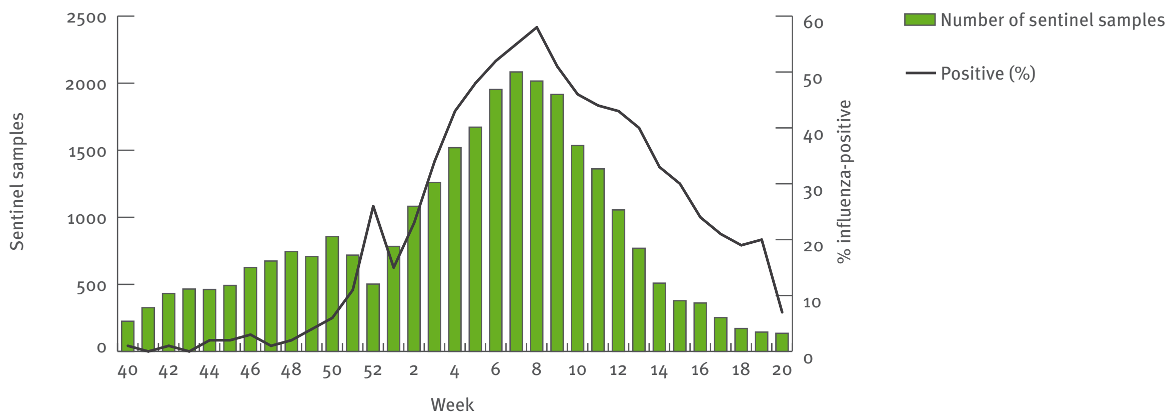
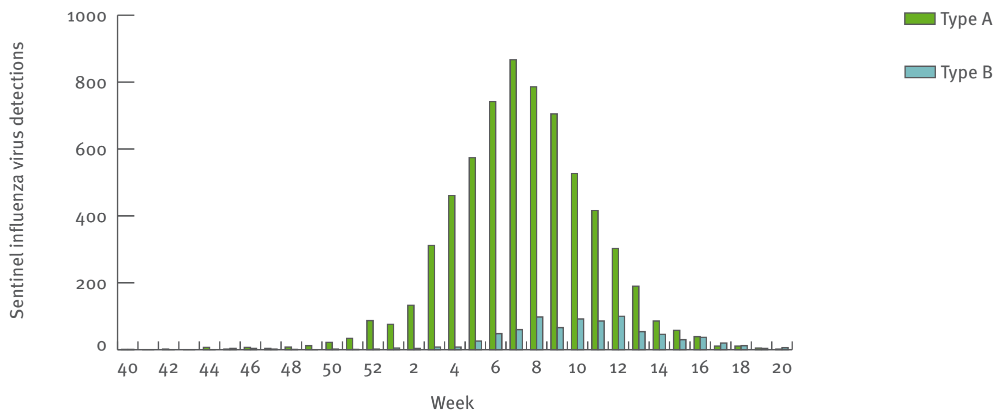


Figure 2.1.3. Weekly number of sentinel influenza virus detections by type, weeks 40/2011 to 20/2012



intensity was so low that ILI rates remained at the baseline level[4]. In almost all reporting countries, the most affected age group for mild disease according to reports was small children up to four years old.

Virological surveillance

Like the ILI and ARI rates, the proportion of sentinel specimens positive for influenza virus, a good indicator of influenza activity[5], peaked overall in Europe in week 8, with 58% of samples testing positive (Figure 2.1.2). This peak was dissociated from the number of respiratory syncytial virus (RSV) detections which peaked in week 52/2011.

Of 9473 influenza viruses detected in sentinel specimens, 8462 (89%) were type A and 1 011 (11%) were type B. The vast majority (98%) of subtyped influenza A viruses was A(H3) and only 2% were A(H1)pdm09 (Table 2.1.1). Type A viruses were dominant throughout almost the entire epidemic. Only at the end of the influenza season (from week 15/2012 onwards), the circulation of B virus was dominant, although the absolute number of detected viruses was decreasing (Figure 2.1.3). As suggested by the antigenic characterisation of influenza viruses and confirmed by reference laboratories, there was an imperfect match between the circulating and the vaccine A(H3) strains[6]. This was associated with an unusually low vaccine effectiveness which declined during the season[7]. At the same time, vaccination coverage among people above 65 years of age showed a continuing declining trend in 2011–2012 in many, but not all countries (Fig 2.1.4)[8].

Table 2.1.1. Number of sentinel detections of influenza virus by type, subtype and lineage from week 40/2011 to week 20/2012 in 29 EU/EEA countries

Virus type/subtype	Number of sentinel specimens
Influenza A	8462
A(H1)pdm09	117
A(H3)	7682
A(subtype unknown)	663
Influenza B	1011
B(Victoria) lineage	113
B(Yamagata) lineage	74
Unknown lineage	824
Total influenza	**9473**

Antiviral resistance

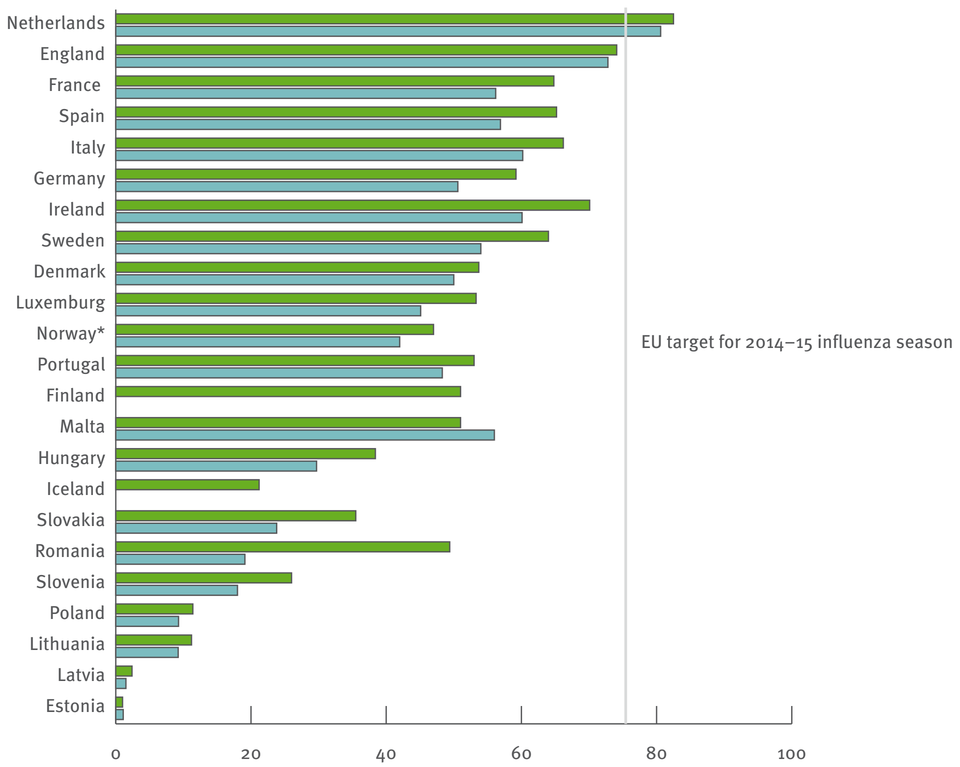
None of the A(H1N1)pdm09, A(H3N2) and B viruses tested for susceptibility to neuraminidase inhibitors showed resistance or reduced susceptibility. All A(H1N1)pdm09 and A(H3N2) viruses tested for M2-blocker susceptibility were resistant (Table 2.1.2).

Impact: severe disease and mortality

Surveillance of hospitalised laboratory-confirmed influenza cases

Countries reporting severe influenza surveillance data have applied two case definitions: (i) laboratory-confirmed influenza requiring hospitalisation or (ii) severe acute respiratory infection (SARI), sometimes

Figure 2.1.4. Reported seasonal influenza vaccination coverage (%) in the older population in 23 EU/EEA Member States for 2008–2009 and 2010–2011 influenza seasons



* Coverage results calculated for those >65 years old and clinical risk groups together.

Table 2.1.2. Antiviral resistance by influenza virus type and subtype, weeks 40/2011 to 20/2012

Virus type and subtype	Resistance to neuraminidase inhibitors				Resistance to M2 inhibitors	
	Oseltamivir		Zanamivir			
	Isolates tested	Resistant n (%)	Isolates tested	Resistant n (%)	Isolates tested	Resistant n (%)
A(H3N2)	705	0	697	0	174	174 (100%)
A(H1N1)	53	0	53	0	7	7 (100%)
B	48	0	47	0	Not applicable	Not applicable

without laboratory confirmation. Both France and Ireland reported only cases admitted to intensive care. For the purpose of this report, only hospitalised laboratory-confirmed influenza cases were included in the analysis.

Overall, an influenza virus infection was laboratory-confirmed in 1 316 hospitalised cases in six EU countries. Of the viruses causing these infections, 1 269 (96%) were type A and 47 (4%) were type B. Of the 1 269 influenza A viruses, 774 (61%) were A(H3), 47 (4%) were A(H1)pdm09 and 448 (35%) were not subtyped. The male-to-female ratio was 1.2. Most cases were observed in the youngest and oldest age groups and A(H3) accounted for most cases in each age group. Of the 1052 cases with age group recorded, 456 (43%) were 65 years or older. Of the 845 hospitalised laboratory-confirmed influenza cases with known outcome, 98 (12%) died.

Of 560 hospitalised influenza cases with information on underlying conditions, 452 (81%) had at least one recognised risk factor for severe disease, most commonly chronic respiratory disease (131), cardiac disease (90) and diabetes (82). Pregnancy was reported in five women, all of them falling in the 15–44-year-old age group. Of 723 cases with known vaccination status, 489 (68%) were not vaccinated.

Weekly monitoring of mortality from all causes by EUROMOMO (European monitoring of excess mortality for public health action) showed excess deaths among the elderly in 12 EU countries (Belgium, Finland, France, Greece, Hungary, Ireland, the Netherlands, Portugal, Spain, Sweden, Switzerland and the United Kingdom)[9]. This increase coincided with increased influenza activity in most countries. However, a cold spell during weeks 4 to 6 in Europe may have also contributed to this excess mortality.

Outbreaks and deaths associated with influenza in care homes for the elderly were reported in at least three countries (France, Spain and the United Kingdom). In Spain and the United Kingdom, this occurred despite high levels of vaccination in those age groups[10,11,12]. It was noted in Spain that despite antivirals being available, they were not used for prophylaxis.

Ireland also had a significant number of outbreaks in care homes for the elderly, 17 in total for that season. Home residents had high levels of vaccination but there was poor vaccine coverage among healthcare staff. Twelve influenza-associated deaths were linked to these outbreaks, all of whom were aged 80 years or older.

Updates from epidemic intelligence in 2012

Aside from the annual seasonal influenza risk assessment[2] performed early in the season, ECDC carried out six risk assessments associated with influenza and other respiratory viruses 2012.

Avian influenza A(H5N1) in humans

In 2012, 32 confirmed human cases of avian influenza A(H5N1) were reported to WHO[13] by Bangladesh, Cambodia, China, Egypt, Indonesia and Vietnam. This is the lowest number of human cases since 2004. However, the case–fatality rate remains high with 20 deaths (62.5%).

Genetically modified A(H5N1) viruses – gain of function research

Two studies on genetically modified A(H5N1) viruses were simultaneously submitted to scientific journals, one was carried out in the USA and the other in Europe. The results of the first American study showed that these viruses could be made to be transmissible via air-borne droplets between ferrets. These animals are considered by many to be the best animal model for mimicking the behaviour of influenza in humans. The second study had similar results. However, it later became apparent that the modified viruses were only mildly pathogenic in ferrets when spreading naturally. These papers were accepted for publication, but raised considerable concerns among oversight bodies over the potential for engineering, by accident or design, of an A(H5N1) virus transmissible among humans. Following a prolonged global debate and a self-imposed moratorium on further research, both papers were eventually published since the benefits were considered to outweigh the risks[12,14,15]. The self-imposed moratorium was lifted in early 2013[16,17].

Swine influenza A(H3N2)v in humans

In 2011, an A(H3N2) variant swine influenza virus, containing one surface protein (M2) from the A(H1N1)pdm09 virus was detected in humans in the United States. In 2012, 309 human cases in 12 US states were infected by this triple-reassortant influenza A(H3N2)v[18]. The virus was detected in children attending fairs where pigs were exhibited. Most patients experienced mild disease and recovered spontaneously. However, 16 patients with underlying conditions were hospitalised and one died. In Europe, no case of influenza transmitted from swine to human was detected in 2012. It is not thought that the A(H3N2)v viruses are present in pigs in Europe[19].

Conclusion

The influenza season 2011–2012 was late without any particular geographical progression pattern. The intensity of ILI/ARI activity was mild or unusually low in the majority of countries. Infants aged 0–4 years were the most affected outpatients and were the second largest age group after the elderly in hospitalised influenza cases reported by six EU countries. Even though A(H1N1) pdm09 viruses continued to circulate, they were largely exceeded by A(H3N2), with older age groups affected, and by B viruses which became dominant late in the season. The dominance of A(H3N2) viruses was hardly surprising, given the fact that there had not been an A(H3N2)-dominated season since 2006–07. Antigenic characterisations of A(H3N2) viruses showed considerable antigenic diversity resulting in an imperfect match with the vaccine strain. This was also reflected in the relatively low vaccine effectiveness observed and led to the WHO decision to recommend changing the composition of the next influenza vaccine. Excess mortality in the elderly possibly related to influenza and/or cold weather was observed in 12 EU countries. There was no human case related to avian or swine influenza in Europe in 2012. In the US, 309 people, mainly children, were mildly infected with a new A(H3N2) variant virus through pigs exhibited in fairs.

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Avian influenza and other animal influenzas

Wild birds are the main reservoir of animal influenza viruses. These viruses are constantly changing through mutation and genetic re-assortment. Wild aquatic birds are considered to be the original natural reservoir for most influenza viruses although the virus is also endemic in other species, for instance pigs. Occasionally the viruses infect humans and very occasionally they are the source of pandemic viruses[1].

In 2012, no outbreak of highly pathogenic avian influenza (HPAI) in poultry or wild birds was reported in Europe while epidemics were reported in Africa, Australia, North America, the Middle East and especially in Asia where the majority of outbreaks emerged[2]. The subtype H5N1 was mainly responsible for these (HPAI outbreaks, but other subtypes were also reported: H5N2, H7N1, H7N3, H7N7.

Since 1996, strains of highly pathogenic influenza viruses type A(H5N1), and to a lesser extent A(H7), have continued to cause outbreaks in bird populations in Asia and Africa and have led to some sporadic human cases on other continents. Although the absolute number of cases is decreasing each year, the case–fatality rate remains very high. HPAI A(H5N1) viruses remain a concern for human health in Europe because of the following characteristics:

- They are still highly pathogenic for humans despite a decrease in the global number of cases.
- It is a persistent zoonotic infection among birds with which humans are in close contact.
- They are continuing to evolve.
- There is a risk of genetic re-assortment with influenza viruses that are better adapted to, and transmissible among humans.
- Laboratory-modified A(H5N1) viruses have been shown to have the potential to become transmissible between humans[3,4].

A list of candidate vaccines for clinical trials and pandemic preparedness has been published by the World Health Organization[5]. A significant advance in 2012 was the application of more structured risk assessments to determine which are the avian and other animal influenza viruses that warrant the preparation of diagnostics and vaccines[6].

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Legionnaires' disease

- Legionnaires' disease remains an uncommon, mainly sporadic infection with low notification rates in EU and EEA countries (overall 1.0 per 100 000 inhabitants).
- Four countries (France, Italy, Spain and Germany) reported 72% of all notified cases.
- Two large outbreaks, which were monitored by ECDC, occurred in Scotland (United Kingdom) and Spain in 2012 with 48 and 42 cases, respectively.
- Regular checks for *Legionella* and appropriate control measures in man-made water systems may prevent a significant proportion of Legionnaires' disease cases.

Legionnaires' disease is a pneumonia often associated with systemic symptoms and caused by the Gram-negative bacteria, *Legionella* spp., which are found in freshwater environments worldwide[1]. Humans are infected by inhalation of aerosols containing *Legionella* bacteria, which may result in severe pneumonia with a fatal outcome. Outbreaks can originate from a common environmental water source, such as a cooling tower. Cases of Legionnaires' disease are mainly reported among persons in older age groups, especially in males.

Epidemiological situation in 2011

In 2011, 4 917 cases were reported by 29 countries with six countries (France, Italy, Spain, Germany, the Netherlands and the United Kingdom) accounting for 83% of all notified cases. The overall notification rate

Figure 2.1.5. Trend and number of cases of Legionnaires' disease reported in the EU/EEA, 2007–2011

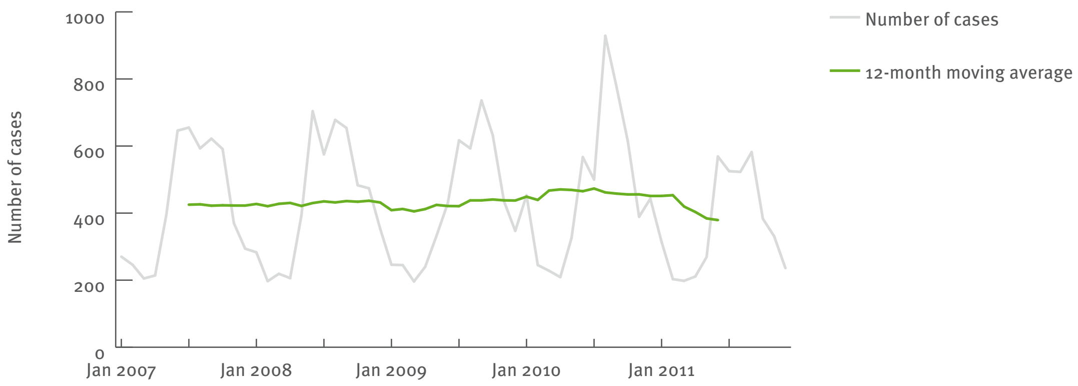
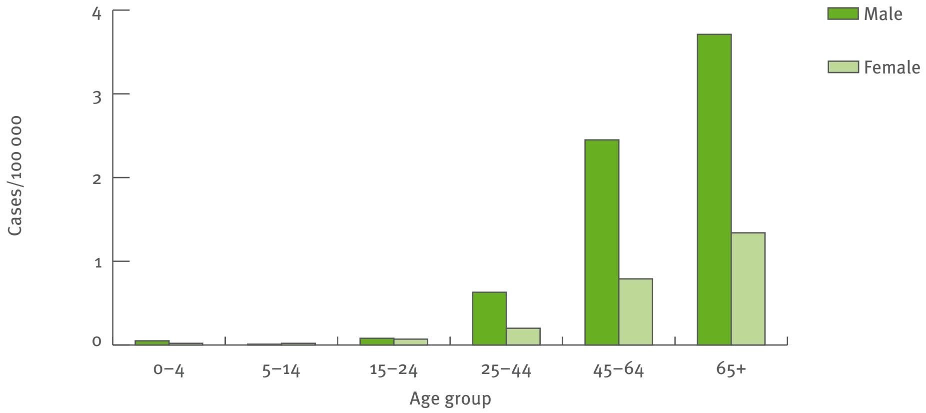


Figure 2.1.6. Rates of cases of Legionnaires' disease reported in the EU/EEA, by age and gender, 2011



Source: Country reports from Austria, Belgium, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

was 1.0 per 100 000 inhabitants in 2011, 22% lower than in the previous year. Very few cases were reported by eastern European countries such as Bulgaria, Poland or Romania. With the notable exception of an August peak in 2010, the average monthly number of reported cases has remained stable over the past five years (Figure 2.1.5). As in previous years[2], most cases were community-acquired (67%) while 24% were travel-associated, 7% were related to healthcare facilities and 3% to other settings. The decrease compared to 2010 was less pronounced in travel-associated cases (-9%) than in cases with other probable settings of infection. Among the six largest reporting countries, only Germany reported more community-acquired cases in 2011 (+8%). Of 3 436 cases with known outcome, 306 were reported to have died, giving a case–fatality rate of 9%.

Distribution by age and gender

In 2011, people aged 65 years and older accounted for 2 072 (42%) of 4 909 cases with known age. The male-to-female ratio was 2.5:1. Notification rates increased with age, from < 0.1 per 100 000 in those under 25 years to 2.3 in persons aged 65 years and over (3.7 per 100 000 in males and 1.3 in females) (Figure 2.1.6).

Seasonality

The distribution of cases by month of onset showed a peak in summer, with 58% of all cases having a date of onset between June and October (Figure 2.1.7). In 2011, the August-September peak was not as prominent as in previous years.

Enhanced surveillance

In addition to the retrospective surveillance of Legionnaires' disease, the European Legionnaires' Disease Surveillance Network (ELDSNet) conducts daily surveillance of travel-associated cases. In 2011, 763 travel-associated cases were reported, which was 12% less than the number of cases reported in 2010[2].

A total of 82 new travel-associated clusters[i] were notified in 2011. In 37 (45%) of these clusters, the first two reported cases were from different countries, and they were therefore unlikely to have been detected without ELDSNet. Legionella was found in 60 environmental cluster investigations. Seven of the 82 accommodation sites associated with clusters had their names published on ECDC's website due to unsatisfactory or uncertain control measures.

Update from epidemic intelligence 2012

In 2012, ECDC monitored 14 threats related to Legionnaires' disease, 13 of which were travel-associated, rapidly evolving clusters[ii].

The largest outbreak in 2012 was associated with a hotel in Calpe, Spain[3]. It included 42 cases with dates of onset between December 2011 and June 2012. Strong evidence suggested the spa pool to be the source of the outbreak.

In June 2012, a community outbreak occurred in the city of Edinburgh, United Kingdom[4]. It consisted of 48 confirmed and 49 suspected cases. The investigation concluded that industrial cooling towers were the likely source of infection.

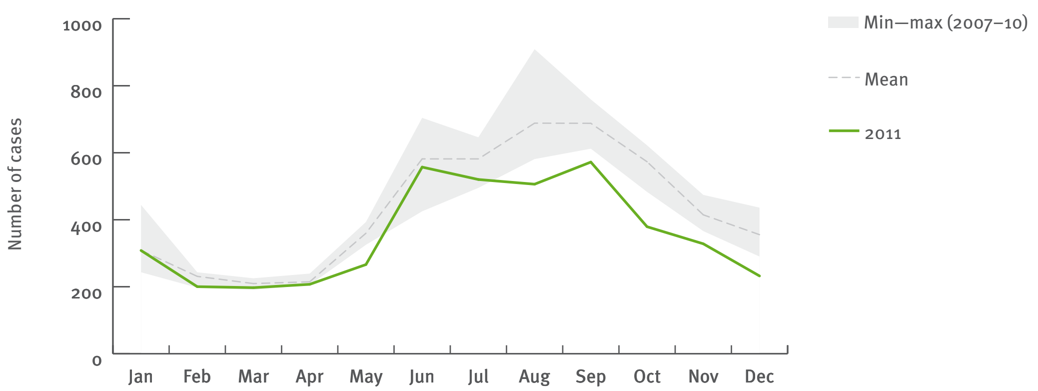
Discussion

The decrease in notifications of Legionnaires' disease observed in 2011 was mainly driven by a reduced number of community-acquired cases notified by the largest reporting countries. This may be linked to specific environmental conditions unfavourable to the growth of Legionella spp., especially during the second half of the year[5–7]. The fact, that travel-associated cases and

i A cluster is defined as two or more cases that stayed at the same public accommodation site in the two to 10 days before onset of illness where the onsets were within the same two year period.

ii A rapidly evolving cluster is defined as three or more cases with dates of onset within a three-month period during the last six months.

Figure 2.1.7. Seasonal distribution: Number of confirmed cases of Legionnaires' disease by month, EU/EEA, 2007–2011



especially those with a travel history abroad decreased less, supports this hypothesis. Germany and some other countries may have seen less reduction in notifications because they are still catching up, their notification rates remaining far below what would be expected. In eastern European countries where under-ascertainment remains considerable, targeted studies on diagnostics and surveillance systems should be carried out. For example, cross-sectional prevalence studies at major university hospitals could raise awareness of the disease among local clinicians.

Despite the observed decrease in 2011, factors such as global warming, increasing use of man-made water systems, increasing travel and an ageing European population could drive an overall rise in Legionnaires' disease incidence in the future. Regular checks for presence of Legionella and appropriate control measures in man-made water systems may prevent a significant proportion of Legionnaires' disease cases[8].

In 2011, the number of travel-associated Legionnaires' disease cases notified was lower than in previous years. However, similar to previous years the near real-time surveillance at European level has once again proved useful, since 45% of the clusters were unlikely to have been detected without ELDSNet. In 2012, the network played a crucial role in monitoring two major outbreaks.

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Table 2.1.3. Numbers and rates of Legionnaires' disease cases reported in the EU/EEA, 2007–2011

Country	2011					2010		2009		2008		2007	
	National coverage	Report type	Reported cases and rate per 100 000 population			Reported cases and rate per 100 000 population		Reported cases and rate per 100 000 population		Reported cases and rate per 100 000 population		Reported cases and rate per 100 000 population	
			Cases	Rate	Age standardised rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	Y	C	101	1.20	1.14	80	0.96	92	1.10	101	1.21	107	1.29
Belgium	Y	C	79	0.72	0.70	89	0.82	80	0.74	0	0.00	77	-
Bulgaria	Y	C	0	0.00	0.00	1	0.01	3	0.04	1	0.01	0	0.00
Cyprus	Y	C	1	0.12	0.12	2	0.24	3	0.38	9	1.14	1	0.13
Czech Republic	Y	C	57	0.54	0.53	38	0.36	18	0.17	13	0.13	18	0.18
Denmark	Y	C	123	2.21	2.15	133	2.40	123	2.23	130	2.37	134	2.46
Estonia	Y	C	7	0.52	0.51	0	0.00	6	0.45	7	0.52	3	0.22
Finland	Y	C	9	0.17	0.15	24	0.45	22	0.41	16	0.30	39	0.74
France	Y	C	1170	1.80	1.79	1540	2.38	1206	1.87	1244	1.94	1428	2.24
Germany	Y	C	634	0.78	0.69	688	0.84	503	0.61	522	0.64	529	0.64
Greece	Y	C	18	0.16	0.15	9	0.08	15	0.13	29	0.26	25	0.22
Hungary	Y	C	37	0.37	0.37	60	0.60	65	0.65	25	0.25	18	0.18
Ireland	Y	C	7	0.16	0.20	11	0.25	7	0.16	11	0.25	15	0.35
Italy	Y	C	1018	1.68	1.48	1238	2.05	1207	2.01	1196	2.01	954	1.61
Latvia	Y	C	49	2.20	2.15	6	0.27	3	0.13	5	0.22	2	0.09
Lithuania	Y	C	2	0.06	0.06	1	0.03	0	0.00	0	0.00	0	0.00
Luxembourg	Y	C	6	1.17	1.18	10	1.99	5	1.01	5	1.03	5	1.05
Malta	Y	C	9	2.16	2.11	6	1.45	5	1.21	2	0.49	14	3.43
Netherlands	Y	C	311	1.87	1.82	466	2.81	251	1.52	337	2.05	325	1.99
Poland	Y	C	18	0.05	0.05	36	0.09	10	0.03	12	0.03	0	0.00
Portugal	Y	C	89	0.84	0.80	128	1.20	96	0.90	102	0.96	82	0.77
Romania	Y	C	1	0.01	0.01	1	0.01	3	0.01	4	0.02	1	0.01
Slovakia	Y	C	7	0.13	0.13	4	0.07	2	0.04	7	0.13	2	0.04
Slovenia	Y	C	44	2.15	2.05	58	2.83	66	3.25	47	2.34	32	1.59
Spain	Y	C	706	1.53	1.48	1150	2.50	1231	2.69	1234	2.73	1136	2.55
Sweden	Y	C	127	1.35	1.30	100	1.07	114	1.23	153	1.67	127	1.39
United Kingdom	Y	C	251	0.40	0.40	376	0.61	374	0.61	398	0.65	496	0.82
EU total	-	-	**4881**	**0.97**	**0.93**	**6255**	**1.25**	**5510**	**1.10**	**5610**	**1.13**	**5570**	**1.13**
Iceland	Y	C	3	0.94	1.18	2	0.63	7	2.19	2	0.63	12	3.90
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	33	0.67	0.69	48	0.99	34	0.71	38	0.80	35	0.75
Total	-	-	**4917**	**0.97**	**0.93**	**6305**	**1.25**	**5551**	**1.10**	**5650**	**1.12**	**5617**	**1.13**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by: Laboratories	Physicians	Hospitals	Others	National coverage	National reference laboratory data	Comparable data available	Case definition used
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Belgium	BE-FLA_FRA_LABNET_REFLAB	Cp	O	A	C	Y	Y	Y	-	Y	-	-	Not specified/unknown
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	Y	-	-	EU-2008
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y	-	-	EU-2008
Denmark	DK-MIS	Cp	Co	P	C	N	Y	N	N	Y	-	-	Other
Estonia	EE-LEGIONELLOSIS	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Finland	FI-NIDR	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
France	FR-MANDATORY_INFECTIOUS_DISEASES	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	Not specified/unknown
Germany	DE-SURVNET@RKI-7.1	Cp	Co	P	C	Y	N	N	Y	Y	-	-	Other
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Hungary	HU-EFRIR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Ireland	IE-CIDR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Italy	IT-LEGIONELLOSIS	Cp	Co	P	C	N	Y	Y	N	Y	-	-	Other
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU case definition (legacy/deprecated)
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Netherlands	NL-OSIRIS	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	Not specified/unknown
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	Other
Portugal	PT-LEGIONELLOSIS	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
Romania	RO-RNSSy	Cp	Co	P	C	N	N	Y	N	Y	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y	-	-	EU-2008
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Spain	ES-STATUTORY_DISEASES	Cp	Co	P	C	N	Y	Y	N	Y	-	-	EU-2008
Sweden	SE-SMINET	Cp	Co	P	C	Y	N	N	N	Y	-	-	EU-2008
United Kingdom	UK-LEGIONELLOSIS	O	Co	A	C	Y	N	Y	Y	Y	-	-	Other

Severe acute respiratory syndrome (SARS)

- Knowledge about the epidemiology and ecology of SARS coronavirus infection remains presently incomplete and risks of re-emergence are unpredictable.
- The rapid spread of SARS worldwide showed the need to maintain surveillance despite the disease's absence since 2003.
- The emergence in 2012 of a novel coronavirus in humans in the Middle East associated with early detection of imported cases to Europe showed that SARS and related viruses need to be closely monitored worldwide and capacity needs to be maintained to respond accordingly.

Severe acute respiratory syndrome (SARS) is a respiratory disease in humans caused by the SARS coronavirus (SARS-CoV). In 2002–03 an epidemic originating in Foshan, Guangdong Province, China, spread globally, with over 8 000 known cases reported in eight months from 33 countries on five continents, of which 21% were healthcare workers. The case–fatality rate was about 10%. The last known community case occurred in the USA in July 2003, but another localised SARS-related crossover from animals occurred in 2004[1].

Epidemiological situation in 2011

Although surveillance has been ongoing, there were no reports of SARS virus infection in humans from 29 EU/EEA countries (no reports from Liechtenstein) in 2011; nor have there been any reports of SARS virus infection in humans worldwide since 2003.

Discussion

SARS is believed to have been an animal virus that recently crossed the species barrier to infect humans. Bats have been identified as potential reservoir hosts of coronaviruses associated with SARS[2]. The SARS outbreak illustrated the importance of sensitive detection tools in the preparedness for, and response to, emerging health threats. Other key preparedness activities include advance planning, communication, education and training, and stockpiling supplies of personal protective equipment[3–5].

The emergence in 2012 of human cases of an acute respiratory illness of unknown origin in several countries in the Middle East (Jordan, Qatar and Saudi Arabia, with importation of several cases to Europe) revealed the importance of close monitoring, collaboration between laboratories to promptly set up laboratory capacity for detection and characterisation of emerging pathogens, and appropriate protective biosafety measures using lessons learnt from the past SARS outbreak[6–9].

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Tuberculosis

- In 2011, 29 EEA countries, 27 of them EU countries, reported 72 334 tuberculosis (TB) cases with an overall rate of 14.2 cases per 100 000 population; 44 361 (61.3%) of these cases were laboratory-confirmed.
- Of 72 334 cases reported, 55 939 (77.3%) suffered from pulmonary TB, 16 116 (22.3%) from extrapulmonary TB, and for 279 (0.4%) of all cases, no site was reported.
- Between 2006 and 2011, the reported TB rate decreased by an annual average of 4.0%, with a net decrease in 22 countries.
- The highest rates in 2011 were reported by Romania (89.7 per 100 000 population), Lithuania (58.7), Latvia (39.7), Bulgaria (32.1), Estonia (25.4), Portugal (23.9) and Poland (22.2).
- In 2011, 18 646 (25.8% of all notified TB cases) were reported as being of foreign origin.
- Multidrug-resistance (MDR) remained most prevalent in the Baltic States (14.8%–29.8%) and Romania (8.8%). Generally, MDR was more common in cases of native origin.
- In 21 countries reporting drug susceptibility testing results for second-line anti-TB drugs, 13.4% of MDR TB cases were also extensively drug-resistant (XDR).
- Among previously untreated, culture-confirmed pulmonary TB cases, 76.8% had a successful treatment outcome at 12 months, as opposed to 53.7% of previously treated pulmonary TB cases and 31.6% of all culture-confirmed MDR TB cases at 24 months.

Tuberculosis (TB) is an infectious disease caused by the bacterium *Mycobacterium tuberculosis*. It typically affects the lungs (pulmonary TB), but can affect other sites as well (extrapulmonary TB). The disease is spread through droplet transmission when people suffering from pulmonary TB expel bacteria, for example by coughing. In general, a relatively small proportion of people infected with *Mycobacterium tuberculosis* will go on to develop TB disease, but the likelihood is much higher with impaired immunity. Antibiotic treatment is the standard, but takes at least six months and is increasingly hampered by multidrug-resistance.

Epidemiological situation in 2011

In 2011, 72 334 TB cases (possible, probable and confirmed[i]) were reported by 27 EU countries, Iceland and Norway (Table 2.1.4). The reported TB rate was 14.2 per 100 000 population in 2011. Rates higher than 20 per 100 000 were reported by Romania (89.7), Lithuania (58.7), Latvia (39.7), Bulgaria (32.1), Estonia (25.4), Portugal (23.9) and Poland (22.2). Cases reported in these seven high-incidence countries accounted for 49.4% of all reported cases. TB case rates in 19 countries were below 10 per 100 000.

The overall rate in 2011 was 4.7% lower than in 2010, reflecting a decrease in 21 countries. The overall average annual decrease between 2007 and 2011 was 4.0% with a net decrease in 22 countries.

Previous treatment and laboratory confirmation

Very similar to the distribution in 2010, 57 659 (79.7%) of 72 334 TB cases reported in 2011 were newly diagnosed, 8 916 (12.3%) had been previously treated for TB and 5 759 (8.0%) had an unknown previous treatment status. Country-specific proportions of new cases ranged from 42.3% in Luxembourg to 96.0% in Finland. The Member States with the lowest proportions of new cases had the highest proportions of cases with unknown previous treatment status.

Laboratory confirmation was reported for 44 361 (61.3%) of 72 334 cases overall (Figure 2.1.8). All of those laboratory-confirmed cases but 51 (0.1%) were confirmed by culture, the rest by microscopy and nucleic acid amplification test. Country-specific proportions of laboratory-confirmed cases ranged from 27.9% in Italy (provisional data) to 94.8% in Slovenia. Overall, the trend in case confirmation by culture, nucleic acid detection and sputum smear has steadily increased since 1995.

Age and gender distribution

Of the TB cases notified in 2011, males were more affected than females in the age groups of 15 years and older (Figure 2.1.9) with an overall male-to-female ratio of 1.8. Males were overrepresented in all EU/EEA Member States except Iceland.

The biggest caseload of new TB was observed in adults from 25 to 44 years of age. However, although this age group and the 45–64 year age group together accounted for 64.2% of all new cases, rates in the age groups 15

i A TB case is reported to ECDC according to the case definition from the European Commission; cases are divided into 'possible' (based on clinical criteria only), 'probable' (additional detection of acid-fast bacilli (AFB) in sputum, *M. tuberculosis* in nucleic acid, or granulomata in histology) and 'confirmed' (by culture or by detection of both positive AFB in sputum and *M. tuberculosis* in nucleic acid).

Table 2.1.4. Numbers and rates of reported tuberculosis cases (confirmed, probable and possible) per 100 000 population in the EU/EEA, 2007–2011

Country	National coverage	Report type	2011					2010		2009		2008		2007	
			Total cases and rate		Confirmed cases and rates			Total cases and rate		Total cases and rate		Total cases and rate		Total cases and rate	
			Cases	Rate	Cases	Rate	Age-standardised rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	Y	C	687	8.2	466	5.5	5.5	691	8.3	696	8.3	817	9.8	874	10.6
Belgium	Y	C	1044	9.5	797	7.4	7.3	1086	10.0	994	9.2	990	9.3	1020	9.6
Bulgaria	Y	C	2407	32.1	1071	14.3	13.9	2649	35.0	2910	38.3	3150	41.2	3038	39.6
Cyprus	Y	C	54	6.7	44	5.2	5.2	61	7.6	55	6.9	50	6.3	42	5.4
Czech Republic	Y	C	600	5.7	426	4.0	4.0	669	6.4	694	6.6	864	8.3	846	8.2
Denmark	Y	C	381	6.9	272	4.9	5.0	366	6.6	334	6.1	380	6.9	391	7.2
Estonia	Y	C	341	25.4	264	19.7	19.7	333	24.8	411	30.7	444	33.1	491	36.6
Finland	Y	C	325	6.0	252	4.7	4.6	325	6.1	417	7.8	344	6.5	348	6.6
France	Y	C	4942	7.6	2309	3.6	3.7	5116	7.9	5276	8.2	5758	9.0	5574	8.8
Germany	Y	C	4316	5.3	3071	3.8	3.6	4388	5.4	4427	5.4	4523	5.5	5000	6.1
Greece	Y	C	489	4.3	278	2.5	2.4	487	4.3	589	5.2	664	5.9	639	5.7
Hungary	Y	C	1445	14.5	597	6.0	5.8	1741	17.4	1407	14.0	1619	16.1	1685	16.7
Ireland	Y	C	425	9.5	288	6.4	6.8	420	9.4	479	10.8	468	10.6	480	11.1
Italy*	N	C	3521	5.8	982	1.6	1.6	4692	7.8	4244	7.1	4418	7.4	4525	7.7
Latvia	Y	C	885	39.7	671	30.1	29.7	935	41.6	977	43.2	1070	47.1	1255	55.0
Lithuania	Y	C	1904	58.7	1403	43.8	43.2	1938	58.2	2081	62.1	2250	66.8	2408	71.1
Luxembourg	Y	C	26	5.1	19	3.7	3.7	29	5.8	27	5.5	28	5.8	39	8.2
Malta	Y	C	33	7.9	24	5.7	5.8	32	7.7	44	10.6	53	12.9	38	9.3
Netherlands	Y	C	1007	6.0	732	4.4	4.5	1065	6.4	1158	7.0	1015	6.2	998	6.1
Poland	Y	C	8478	22.2	5581	14.6	14.7	7509	19.7	8236	21.6	8080	21.2	8614	22.6
Portugal	Y	C	2540	23.9	1588	14.9	14.7	2626	24.7	2871	27.0	3002	28.3	3139	29.6
Romania	Y	C	19212	89.7	12446	58.1	57.3	21059	98.1	23164	107.7	24680	114.6	24837	115.2
Slovakia	Y	C	399	7.3	188	3.5	3.6	439	8.1	506	9.3	633	11.7	682	12.6
Slovenia	Y	C	192	9.4	182	8.9	8.6	172	8.4	188	9.3	213	10.6	218	10.8
Spain	Y	C	6762	14.7	4383	9.5	9.3	7239	15.7	7592	16.6	8216	18.1	7768	17.5
Sweden	Y	C	586	6.2	476	5.1	5.3	668	7.2	617	6.7	546	5.9	482	5.3
United Kingdom	Y	C	8963	14.3	5285	8.5	8.7	8483	13.7	8917	14.5	8606	14.1	8329	13.7
EU total	**-**	**-**	**71964**	**14.3**	**44095**	**8.8**	**8.5**	**75218**	**15.0**	**79311**	**15.9**	**82881**	**16.7**	**83760**	**16.9**
Iceland	Y	C	9	0.2	4	1.3	1.3	22	6.9	9	2.8	6	1.9	14	4.6
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-	5	14.2
Norway	Y	C	361	6.9	262	5.3	5.4	336	6.9	358	7.5	313	6.6	302	6.5
Total	**-**	**-**	**72334**	**14.2**	**44361**	**8.7**	**8.5**	**75576**	**14.9**	**79678**	**15.8**	**83200**	**16.5**	**84081**	**16.8**

Source: Country reports. Y: Yes; N: No; A: Aggregated data report; C: Case-based report; —: No report; U: Unspecified.

years and older did not differ substantially from each other. Of all 72 274 TB cases notified in 2011 with known age, 3 190 (4.4%) were younger than 15 years, resulting in a reported TB rate of 4.0 per 100 000 children, the same as in 2010.

Site of tuberculosis

Of 72 334 cases reported in 2011, 55 939 (77.3%) suffered from pulmonary TB, including 4 586 (6.3%) with additional extrapulmonary manifestations. Purely extrapulmonary TB affected 16 116 (22.3%), and for 279 (0.4%) of all reported cases, site was not reported. Country-specific proportions of extrapulmonary TB in 2011 ranged from 3.9% in Hungary to 66.7% in Iceland. The overall reported rate had been stable at 3.2 to 3.5 per 100 000 since 2002.

Of 16 116 purely extrapulmonary TB cases notified in 2011, 3 521 (21.8%) had lymphatic TB, 3 084 (19.1%) had pleural TB, and 3 320 (20.6%) suffered from TB at other extrapulmonary sites. No site was specified for 6 191 (38.4%) extrapulmonary TB cases.

In children under 15 years of age, extrapulmonary TB accounted for 1 347 (42.8%) of 3 145 cases with site information, and in adults 15 years of age and older for 14 761 (21.4%) of 68 851 cases.

Origin of TB cases

In 2011, 51 191 (72.2%) of 72 334 reported TB cases were born in an EU/EEA Member State or had citizenship in an EU/EEA Member State, 18 646 (25.8%) were of foreign origin[ii], and 1 497 (1.8%) of unknown origin. Of all foreign TB cases, 6 226 (33.4%) were from Asia (outside the WHO European Region), 5 767 (30.9%) from Africa, 1 880 (10.1%) from other EU/EEA countries, 1 596 (8.4%)

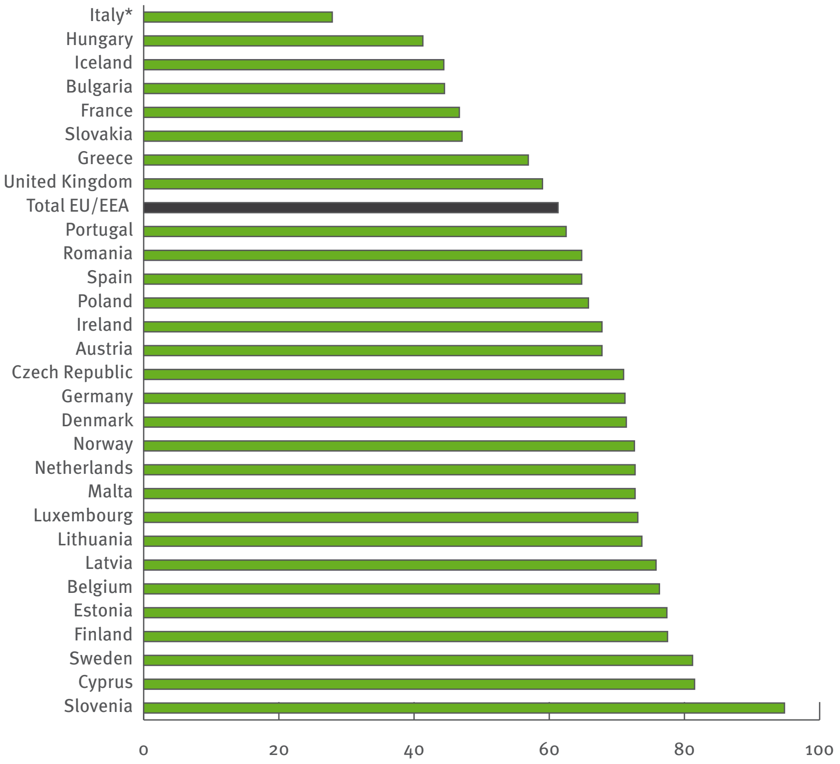
ii The geographic origin of a TB case is classified according to place of birth (born in the country/foreign-born, reported by 24 countries) or, if unavailable, citizenship (citizen/non-citizen, five countries).

from non-EU/EEA European countries, 1021 (5.5%) from the Americas and 2183 (11.7%) from other or unknown countries. In 10 Member States, cases of foreign origin accounted for the majority of cases, reaching 89.4% and 87.8% in Sweden and Norway, respectively. Overall, the proportion of foreign cases has been on the rise since 2001 which in some countries was due to a real increase, whereas in others, it was attributable to the sizeable drop in native cases.

Tuberculosis and HIV infection

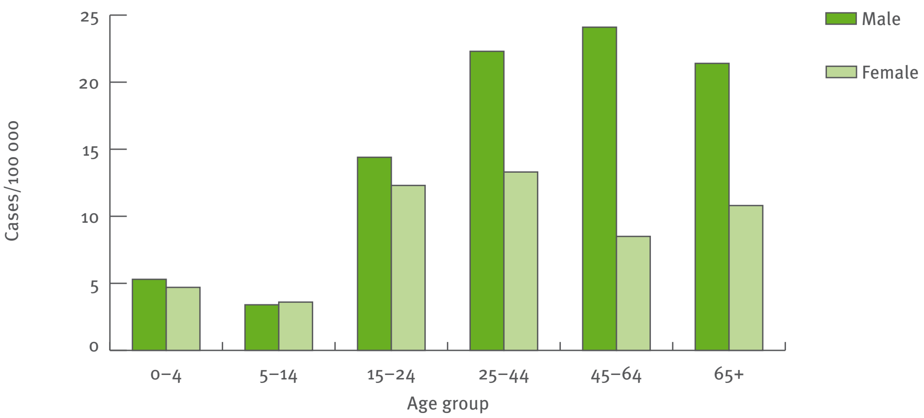
HIV status was reported for 21530 (53.6%) of 40188 TB cases from 16 countries. Five countries only reported HIV-positive cases and so were excluded from the analysis. Of the 21530 cases with known HIV status, 1003 (4.7%) were reported as HIV positive. Among Member States with at least five HIV-co-infected TB cases, the proportion of co-infected cases among TB cases with known HIV status was highest in Ireland, Malta and Estonia at 20.2%, 16.7% and 15.0%, respectively.

Figure 2.1.8. Proportion of confirmed cases among all notified TB cases in the EU/EEA, 2011



* Provisional data

Figure 2.1.9. Rates of tuberculosis cases reported in the EU/EEA, by age and gender, 2011 (n=72175)



Source: Country reports from Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Among 3 097 extrapulmonary TB cases with known HIV status, 190 (6.1%) were reported as HIV positive whereas among pulmonary TB cases, 614 (3.9%) were reported as HIV positive.

Drug-resistant tuberculosis

MDR TB was reported for 1 522 (4.5%) of 33 559 cases with drug susceptibility testing (DST) results (Table 2.1.5). Among cases with known previous TB treatment status, MDR was found in 629 (2.4%) of 25 810 new TB cases and 809 (16.8%) of 4 816 cases who had previously received TB treatment. Like in previous years, MDR TB was most frequently observed in the three Baltic countries with 11 to 23% of all new cases affected. Among previously treated cases, MDR TB was more widespread, reaching 29% to 59% in the Baltic States, but also affecting some low-incidence countries. In cases of extrapulmonary TB, MDR TB was less prevalent than in cases of pulmonary TB (1.1% versus 5.4%). Since 2007, the overall proportion of MDR TB had shown a slight decrease.

Extensively drug-resistant TB was reported for 136 (13.4%) of 1 017 MDR TB cases that had undergone second-line drug susceptibility testing in 2011.

Treatment outcome

Of 62 655 TB cases notified in 2010 with known treatment outcome, 46 545 (74.3%) had been treated successfully, 4 560 (7.3%) had died, 1 122 (1.8%) had failed their treatment, 3 877 (6.2%) had defaulted, 1 835 (2.9%) were still on treatment and 4 716 (7.5%) had been transferred or had an unknown outcome. France, Greece, Italy and Portugal did not report treatment outcome.

Treatment success had been achieved in 76.8% of new laboratory-confirmed pulmonary TB cases, 53.7% of previously treated cases, and 31.6% of MDR TB cases.

Of extrapulmonary TB cases with treatment outcome information, 82.2% were treated successfully as compared to 72.4% of pulmonary TB cases. Among cases with extrapulmonary TB, the lowest treatment success ratios were found in those with disseminated TB (52.3%),

Table 2.1.5. Numbers and percentage of multidrug-resistant and extensively drug-resistant tuberculosis cases, EU/EEA, 2011

Country	Laboratory-confirmed TB cases with DST for first-line drugs	Total multidrug-resistant TB		Total MDR with DST for second-line drugs (N)	Extensively drug-resistant TB*	
		N	%		N	%
Austria	450	19	(4.2)	19	6	(31.6)
Belgium	754	15	(2.0)	15	3	(20.0)
Bulgaria	733	55	(7.5)	46	0	(0.0)
Cyprus	40	1	(2.5)	1	0	(0.0)
Czech Republic	408	7	(1.7)	5	2	(40.0)
Denmark	271	3	(1.1)	2	0	(0.0)
Estonia	262	78	(29.8)	75	14	(18.7)
Finland	245	5	(2.0)	-	-	-
France	1 568	40	(2.6)	-	-	-
Germany	2 821	56	(2.0)	2	0	(0.0)
Greece	159	5	(3.1)	5	2	(40.0)
Hungary	479	7	(1.5)	5	0	(0.0)
Ireland	239	3	(1.3)	1	0	(0.0)
Italy	2 542	81	(3.2)	50	6	(12.0)
Latvia	644	95	(14.8)	95	12	(12.6)
Lithuania	1 403	296	(21.1)	295	53	(18.0)
Luxembourg	19	2	(10.5)	-	-	-
Malta	22	0	(0.0)	0	-	-
Netherlands	726	15	(2.1)	-	-	-
Poland	4 993	41	(0.8)	9	1	(11.1)
Portugal	1 252	22	(1.8)	-	-	-
Romania	6 026	530	(8.8)	248	30	(12.1)
Slovakia	185	3	(1.6)	3	0	(0.0)
Slovenia	182	0	(0.0)	0	-	-
Spain	1 273	41	(3.2)	41	1	(2.4)
Sweden	475	17	(3.6)	17	0	(0.0)
United Kingdom	5 127	81	(1.6)	79	6	(7.6)
Total EU	**33 298**	**1 518**	**(4.6)**	**1 013**	**136**	**(13.4)**
Iceland	4	0	(0.0)	0	-	-
Liechtenstein	-	-	-	-	-	-
Norway	257	4	(1.6)	4	0	(0.0)
Total	**33 559**	**1 522**	**(4.5)**	**1 017**	**136**	**(13.4)**

* Percentages calculated from cases with second-line drug susceptibility testing

TB meningitis (62.9%) and other central nervous system manifestations (68.0%).

Discussion

At EU/EEA level and in the vast majority of Member States, the TB notification rate continues to decrease, confirming the sustained effectiveness of national TB prevention and control programmes despite the economic crisis.

At the same time, the 2011 TB surveillance data remind us of the persistent challenges in surveillance, prevention and control. For some Member States, collecting and reporting surveillance data to ECDC remains a challenge. Lack of surveillance data hampers in-depth understanding of TB epidemiology, monitoring of TB programmes at national and EU/EEA levels, appropriate allocation of resources, and ultimately TB prevention and control itself.

Neither MDR nor XDR TB trends seem to be increasing overall, but European XDR TB surveillance especially is still so patchy that no solid conclusions can be drawn. In the Baltic countries, but also among previously treated cases elsewhere, MDR TB is highly prevalent, justifying the continued utmost vigilance and antimicrobial stewardship.

For many low-incidence countries, TB in persons of foreign origin poses a growing problem. Migrants may import the disease after visiting their endemic home countries; refugees are more likely to contract TB in overcrowded detention camps. They may not necessarily fuel widespread community transmission of TB, but they tend to be harder for the healthcare system to reach and could eventually prove one of the major obstacles on the way to TB elimination in low-incidence countries.

For high-incidence countries, reducing the TB burden remains the major battle. In 2011, they were still faced with notification rates up to 30 times the rates in low-incidence countries. Gradual progress in effective prevention and control of TB in these hardest-hit countries shows in various consistently declining trends over time, but there is still a considerable gap to close before all of Europe can truly envisage TB elimination.

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Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by				National coverage	National reference laboratory data	Comparable data available	Case definition used
						Laboratories	Physicians	Hospitals	Others				
Austria	AT-TUBERKULOSEGESETZ	Cp	Co	A	C	Y	Y	Y	Y	Y	Y	1995	EU case definition (legacy/deprecated)
Belgium	BE-TUBERCULOSIS	Cp	Se	A	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Bulgaria	BG-MOH	Cp	Co	A	C	Y	N	Y	N	-	-	-	Not specified/unknown
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Czech Republic	CZ-TUBERCULOSIS	Cp	Co	A	C	Y	Y	Y	N	Y	-	-	EU-2008
Denmark	DK-MIS	Cp	Co	P	C	N	Y	N	N	Y	-	-	Other
Estonia	EE-TBC	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Finland	FI-NIDR	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
France	FR-MANDATORY_INFECTIOUS_DISEASES	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	Not specified/unknown
Germany	DE-SURVNET@RKI-7.1/6	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	Other
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Hungary	HU-TUBERCULOSIS	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
Iceland	IS-TUBERCULOSIS	Cp	Co	A	C	Y	Y	Y	N	Y	Y	1997	EU case definition (legacy/deprecated)
Ireland	IE-TB	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Italy	IT-NRS	Cp	Co	P	C	N	Y	Y	N	Y	-	-	Other
Latvia	LV-TB	Cp	Co	P	C	Y	Y	Y	N	Y	Y	2000	EU case definition (legacy/deprecated)
Lithuania	LT-TB_REGISTER	-	-	-	-	-	-	-	-	-	N	-	Not specified/unknown
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Netherlands	NL-NTR	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	Not specified/unknown
Poland	PL_CR	Cp	Co	P	C	Y	Y	Y	N	Y	Y	2002	EU case definition (legacy/deprecated)
Portugal	PT-TUBERCULOSIS	Cp	Co	P	C	N	Y	N	Y	Y	-	-	Other
Romania	RO-NTBSy	Cp	Co	P	C	N	Y	N	Y	Y	Y	2003	EU case definition (legacy/deprecated)
Slovakia	SK-NRT	Cp	Co	-	C	Y	Y	Y	N	Y	-	-	Other
Slovenia	SI-TUBERCULOSIS	Cp	Co	A	C	Y	Y	N	N	Y	Y	1954	EU case definition (legacy/deprecated)
Spain	ES-STATUTORY_DISEASES	Cp	Co	P	C	N	Y	Y	N	Y	-	-	EU-2008
Sweden	SE-SweTBReg	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	Not specified/unknown
United Kingdom	UK-TUBERCULOSIS	Cp	Co	A	C	Y	N	Y	Y	Y	Y	-	EU case definition (legacy/deprecated)

2.2 Sexually transmitted infections, including HIV and blood-borne viruses

Chlamydia trachomatis infection

- Of the diseases notifiable in the EU/EEA, chlamydia ranks as the most frequently reported sexually transmitted infection. In 2011, 346 911 cases of chlamydia were reported in 25 EU/EEA Member States; a rate of 175 per 100 000 population. The true incidence of chlamydia is likely to be higher due to underreporting and the asymptomatic nature of the infection.
- Three quarters (73%) of all chlamydia cases were reported in young people between 15 and 24 years of age; the highest rates were reported among women aged 15 to 19 years (1748 cases per 100 000 persons).
- Compared with previous years, the overall EU/EEA trend appears to have stabilised since 2009. However, this has to be interpreted with caution as notification rates are increasing in many countries, most likely reflecting improved case detection and ongoing screening practices.

Infection with the bacterium *Chlamydia trachomatis* ranks as the most frequently reported sexually transmitted infection in Europe, where it also the highest-ranking reportable disease. Most infections are asymptomatic and complications mostly affect women; complications include pelvic inflammatory disease, chronic pelvic pain and reduced fertility.

Epidemiological situation in 2011

In 2011, 25 EU/EEA Member States reported 346 911 cases (175 per 100 000 population). The distribution of chlamydia across EU/EEA appears to be very heterogeneous, with rates of reported cases ranging from below one to more than 500 cases per 100 000 population. Rates above the EU/EEA average were reported by Denmark (479 per 100 000), Finland (254 per 100 000), Iceland (657 per 100 000), Norway (458 per 100 000), Sweden (396 per 100 000) and the United Kingdom (341 per 100 000). Rates below 10 per 100 000 were reported by seven countries (Bulgaria, Cyprus, Greece, Luxembourg, Poland, Romania and Slovakia) (Table 2.2.1).

The United Kingdom continues to contribute a large proportion of reported cases, with 62% of all cases reported in 2011. This is due to the inclusion of cases detected in a screening programme targeting 15–24-year-olds in England. This programme offers community-based testing services outside of STI clinics. Inclusion of data from this programme in ECDC reports has resulted in a large increase of chlamydia diagnoses from 2008 onwards.

Comparisons between countries are difficult because of differences in the surveillance systems, the diagnostic methods used, the amount of testing and screening for chlamydia, and the proportion of underreporting. The availability of a screening programme in dedicated STI services or targeted at (sub)groups of the population, e.g. pregnant women, may significantly affect the reported number of chlamydia cases. This means that the true incidence and prevalence is likely to be higher than the rates reported here.

Age and gender distribution

Data on age were available for 326 860 (94%) of the reported cases. In 2011, almost three quarters (73%) of the cases with information on age were young people 15–24 years (253 669 cases). The age category 20–24 years was the largest affected (42%), followed by the category 15–19 years (31%). The importance of these two age groups has continuously increased since 2000 when 37% of the reports were in the age group 20–24 years and 24% in the 15–19-year olds. This could be due to increased testing activities and screening programmes specifically targeted at young people, and women in particular.

Information on gender was available for 99.7% (345 954) cases. In 2011, 142 473 cases were reported in males and 203 481 in females, with rates of 145 and 203 per 100 000 population, respectively, and a male-to-female rate ratio of 0.7. It should be noted that there is a known ascertainment bias due to the higher proportion of symptomatic infections and more screening opportunities for young women.

Transmission category

Information on transmission was available for 54 985 (16%) cases in 2011 (11 countries) and was indicated as heterosexual in 86%, men who have sex with men (MSM) in 5%, and 'unknown' in 9% of the cases. These proportions have not changed between 2010 and 2011.

The high proportion of missing data for transmission category is mainly due to countries that have a high number of reported cases (Denmark, Norway and Finland) but do not report transmission category. The United Kingdom reported transmission category for 53% of its cases and was not included in this analysis due to potential bias.

Lymphogranuloma venereum (LGV)

In 2011, 697 cases of LGV were reported from six countries: Belgium (21), the Czech Republic (6), Finland (3), France (189), the Netherlands (70) and the United Kingdom (408). Between 2000 and 2011, 2 824 cases of LGV were reported from eight countries, with the majority of cases being reported by France (373), the Netherlands (549) and the United Kingdom (1 775 cases).

Of the 163 cases with information on transmission category, 99% were in MSM. The most affected age group was the group of 35–44-year-olds; information on age was reported for 692 cases. Among cases with known HIV status (194), 88% were HIV positive.

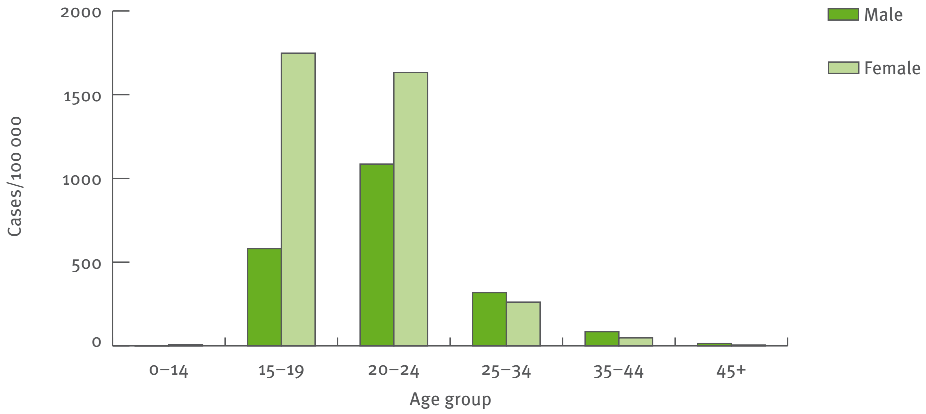
Half (15/30) of the EU/EEA Member States did not report LGV cases for 2011 or before, as LGV diagnosis requires confirmation by genotyping and/or LGV is not included in national surveillance systems. The heterogeneity in case detection and reporting significantly jeopardised the accuracy in understanding the LGV burden in the EU/EEA. In recent years, outbreaks have been communicated from several European countries, predominantly among HIV-positive MSM[1-3]. Recently, an increase in LGV cases in the United Kingdom lead to a doubling of the total number of reported cases in the EU/EEA[4].

Table 2.2.1. Numbers and rates of confirmed chlamydia cases reported in the EU/EEA, 2007–2011

Country	2011				2010		2009		2008		2007	
	National coverage	Report type	Reported cases and rate per 100 000 population		Reported cases and rate per 100 000 population		Reported cases and rate per 100 000 population		Reported cases and rate per 100 000 population		Reported cases and rate per 100 000 population	
			Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria*	N	C	1 004	-	1 085	-	597	-	742	-	822	-
Belgium*	Y	C	3 566	-	3 310	-	2 942	-	2 601	-	2 480	-
Bulgaria	Y	A	55	0.73	49	0.65	-	-	-	-	-	-
Cyprus	Y	C	6	0.71	3	0.37	4	0.5	1	0.13	0	0
Czech Republic	-	-	-	-	-	-	-	-	-	-	-	-
Denmark	Y	C	26 617	478.67	27 950	504.99	29 825	541.15	29 116	531.72	25 795	473.56
Estonia	Y	C	1 720	128.34	1 729	129.02	2 003	149.43	2 206	164.51	2 536	188.91
Finland	Y	C	13 667	254.26	12 825	239.66	13 317	250.02	13 873	261.73	13 968	264.7
France	-	-	-	-	-	-	-	-	-	-	-	-
Germany	-	-	-	-	-	-	-	-	-	-	-	-
Greece	N	A	502	4.44	657	5.81	327	2.9	71	0.63	-	-
Hungary*	Y	A	858	-	710	-	711	-	754	-	699	-
Ireland	Y	A	6 407	142.99	5 399	120.84	5 781	129.91	6 290	142.91	5 023	116.47
Italy*	-	-	339	-	459	-	610	-	210	-	261	-
Latvia	Y	C	1 552	69.61	1 000	44.48	1 142	50.5	750	33.03	716	31.39
Lithuania	Y	C	343	10.57	367	11.02	326	9.73	403	11.97	403	11.91
Luxembourg	Y	C	1	0.20	2	0.4	0	0	4	0.83	0	0
Malta	Y	C	146	34.96	138	33.3	67	16.2	108	26.32	70	17.16
Netherlands*	Y	C	12 926	-	11 374	-	9 788	-	9 355	-	7 821	-
Poland	Y	A	319	0.84	539	1.41	908	2.38	695	1.82	627	1.64
Portugal	-	-	-	-	-	-	-	-	-	-	-	-
Romania	Y	C	133	0.62	97	0.45	91	0.42	127	0.59	115	0.53
Slovakia	Y	C	304	5.59	188	3.47	228	4.21	105	1.94	78	1.45
Slovenia	Y	C	232	11.32	176	8.6	135	6.64	120	5.97	198	9.85
Spain*	N	C	905	-	947	-	846	-	402	-	223	-
Sweden	Y	C	37 290	396.05	36 814	394.13	37 775	408.1	41 974	457.09	47 081	516.62
United Kingdom	Y	A	213 398	341.44	215 501	347.43	214 228	347.8	203 475	332.52	123 629	203.40
EU total	-	-	**322 290**	**166.47**	**321 319**	**167.32**	**321 651**	**177.34**	**313 382**	**173.53**	**232 545**	**138.13**
Iceland	Y	C	2 091	656.61	2 197	691.69	2 271	711.09	1 834	581.38	1 813	589.26
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	22 530	457.90	22 527	463.69	22 754	474.12	23 488	495.82	22 847	488.07
Total	-	-	**346 911**	**174.97**	**346 043**	**175.94**	**346 676**	**186.31**	**338 704**	**182.86**	**257 205**	**148.94**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report. * Sentinel systems, national rates not calculated.
Year according to 'date of diagnosis' variable. Case numbers might differ from those reported in national bulletins due to different date variables.

Figure 2.2.1. Rates of confirmed chlamydia cases reported in the EU/EEA, by age and gender, 2011



Source: Country reports from Bulgaria, Cyprus, Denmark, Finland, Greece, Ireland, Iceland, Lithuania, Luxembourg, Latvia, Malta, Norway, Romania, Sweden, Slovenia, Slovakia and the United Kingdom.

Discussion

Surveillance of chlamydia presents a number of challenges which make the interpretation of its epidemiology across the EU/EEA difficult. The asymptomatic nature of infection with *Chlamydia trachomatis*, especially in women, makes the diagnosis difficult and the number of cases reported is highly affected by national screening and testing practices. Many diagnoses across Europe are therefore not made if asymptomatic young adults are not specifically targeted for testing.

The introduction of sensitive nucleic acid amplification tests (NAATs) in the 1990s has improved chlamydia case detection considerably and has resulted in an increased number of diagnoses in western and northern EU/EEA countries. On the other hand, the low rates reported by a number of central and eastern EU/EEA countries most probably reflect a lack of accurate diagnostic tools, changes in healthcare systems or a shortage of reporting capacity rather than a genuinely low prevalence of chlamydia.

LGV remains a disease primarily found in HIV-positive MSM in the EU/EEA. An accurate description of the epidemic is hampered by heterogeneous case detection and underreporting in EU/EEA countries.

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Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by				National coverage	National reference laboratory data	Comparable data available	Case definition used
						Laboratories	Physicians	Hospitals	Others				
Austria	AT-STISentinella	V	Se	A	C	Y	N	N	N	N	-	-	EU-2008
Belgium	BE-LABNET	V	Se	A	C	Y	N	-	-	Y	-	-	Not specified/unknown
Bulgaria	BG-STI	Cp	Co	P	A	-	-	-	-	-	-	-	Not specified/unknown
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Denmark	DK-LAB	Cp	Co	P	C	Y	N	N	N	Y	-	-	Other
Estonia	EE-HCV/CHLAMYDIA	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Finland	FI-NIDR	Cp	Co	P	C	Y	N	N	N	Y	-	-	Not specified/unknown
Greece	GR-NOTIFIABLE_DISEASES	-	O	P	A	Y	N	Y	N	N	-	-	EU-2008
Hungary	HU-STD SURVEILLANCE	Cp	Se	P	A	N	Y	N	N	Y	-	-	EU-2008
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Ireland	IE-AGGR_STI	Cp	Co	P	A	Y	Y	Y	N	Y	-	-	EU-2002
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Netherlands	NL-STI	V	Se	P	C	N	Y	N	N	Y	-	-	Other
Norway	NO-MSIS_CHLAMYDIA)	Cp	Co	A	A	Y	N	N	N	Y	-	-	Other
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	Not specified/unknown
Romania	RO-RNSSy	Cp	Co	P	A	N	N	Y	N	Y	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y	-	-	EU-2008
Slovenia	SI-SPOSUR	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Spain	ES-MICROBIOLOGICAL	V	Se	P	C	Y	N	N	N	N	-	-	EU-2008
Sweden	SE-SMINET	Cp	Co	P	C	Y	N	N	N	Y	-	-	EU-2008
United Kingdom	UK-GUM-COM	O	Co	P	A	N	N	N	Y	Y	-	-	Other

Gonorrhoea

- In 2011, 39 179 cases of gonorrhoea were reported by 28 EU/EEA countries, a rate of 12.6 per 100 000 population.
- One third (33%) of gonorrhoea cases were reported among men who have sex with men (MSM). More than 40% of all gonorrhoea cases were reported in people below 25 years of age.
- The overall rate has increased by 19% between 2007 and 2011, with most Member States reporting increasing trends.
- Decreased susceptibility of *N. gonorrhoeae* to third-generation cephalosporins remains an important public health issue. In 2011, the European Gonococcal Antimicrobial Surveillance Programme (Euro-GASP) found that 7.6% of isolates were resistant to cefixime; also, Euro-GASP, for the first time, detected isolates with decreased susceptibility to ceftriaxone.

Gonorrhoea is a sexually transmitted infection caused by the bacterium *Neisseria gonorrhoeae*. It is the second most commonly reported bacterial STI in Europe. Control of gonorrhoea relies entirely on antibiotics and is currently being challenged by emerging resistance to third-generation cephalosporins.

Epidemiological situation in 2011

In 2011, 39 179 cases of gonorrhoea were reported in 28 EU/EEA countries resulting in a notification rate of 12.6 per 100 000 population (Table 2.2.2). No data were available from Germany or Liechtenstein. Almost 60% of all notified gonorrhoea cases were reported from the United Kingdom. The overall trend in notifications has increased by 19% between 2007 and 2011; if compared to 2008, the increase rises to 31% (Figure 2.2.2); however, some eastern European countries continue to report decreasing trends.

There is a wide variation in rates of reported cases, ranging from less than 1.5 per 100 000 in Portugal, Poland, Luxembourg and Slovenia to more than 15 per 100 000 in Ireland, Latvia and the United Kingdom.

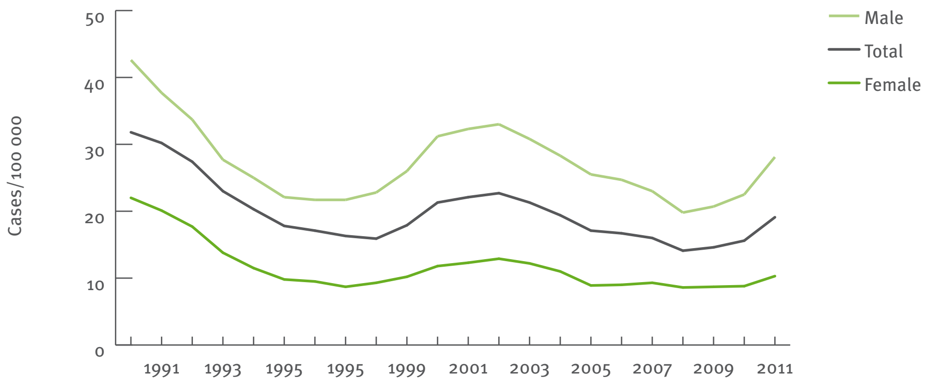
National surveillance systems for all STIs are heterogeneous, with a mixture of voluntary or mandatory reporting, sentinel or national coverage, clinical or laboratory reporting. Major variations in surveillance systems across countries in terms of coverage, completeness and representativeness hamper meaningful comparisons.

Age and gender distribution

Data on age was available for 91% of all cases. The majority (62%) of cases were between 25 and 34 years of age, with 25–34-year-olds contributing 34% of cases. Young adults between 15 and 24 years accounted for 42% of all cases. Age-specific rates of reported cases are highest among 20–24-year-olds (36 per 100 000 population). Age distribution did not change substantially since 2000; there has been a slight increase in the proportion of cases in the age groups 35 to 44 years and above 45 years. Age-specific rates are still low in these groups.

Information on gender was available for 36 797 cases. Men account for 73% of all gonorrhoea cases (26 851 cases), with an overall rate of 21.2 per 100 000, compared with 7.6 per 100 000 among women (9 946 cases). The male-to-female rate ratio was 2.7:1 and ranged from 0.2:1 in Austria to 22:1 in Malta. Only two countries reported a ratio below 1.0:1 (Austria and Estonia).

Figure 2.2.2. Rates of confirmed gonorrhoea cases reported in the EU/EEA, 1990–2011



Source: Country reports from Bulgaria, the Czech Republic, Denmark, Estonia, Greece, Iceland, Ireland, Italy, Latvia, Portugal, Romania, Spain (total rate only), Sweden and the United Kingdom.

Transmission category

In 2011, information on transmission category was available from 19 countries, amounting to 84% of all reported gonorrhoea cases (32 825 cases). Transmission category was either unknown (15%), indicated as heterosexual (53%) or as MSM (33%). Cases diagnosed in MSM represent 53% (n=10 845) of all male cases diagnosed in 2011.

Gonococcal antimicrobial resistance in 2011

In 2011, 21 EU/EEA Member States participated in the European Gonococcal Antimicrobial Surveillance Programme (Euro-GASP). Participating countries submitted 110 consecutive gonococcal isolates. Susceptibility testing was performed by E-test or agar dilution for the following therapeutically relevant antimicrobials: cefixime, ceftriaxone, ciprofloxacin, azithromycin, spectinomycin, and gentamicin. A total of 1 902 isolates were collected and tested. The majority of gonococci (82%) were collected from men. The age range of the patients was less than 1 year to 80 years, with a median of 29 years; 32% of patients were younger than 25 years.

The proportion of tested isolates that have decreased susceptibility to cefixime remained stable in 2011, with 7.6% of isolates showing decreased susceptibility, compared with 8.7% in 2010 (cut-off >0.125 mg/L). Isolates with this phenotype were detected in 17 countries, the same number of countries as in 2010); this number, however, included four countries which had not previously detected isolates with decreased susceptibility. Figure 2.2.4 displays the geographical distribution of these isolates. For the first time in Euro-GASP, ten isolates showed decreased susceptibility to ceftriaxone (>0.125 mg/L).

Results from the external quality assurance scheme for gonococcal antimicrobial resistance showed high comparability between centres. This suggests that surveillance results, with respect to gonococcal antimicrobial susceptibility, can be used with confidence and are comparable.

Table 2.2.2. Numbers and rates of gonorrhoea cases reported in the EU/EEA, 2007–2011

Country	2011 National coverage	Report type	Total cases	Reported cases and rate per 100 000 population		2010 Reported cases and rate per 100 000 population		2009 Reported cases and rate per 100 000 population		2008 Reported cases and rate per 100 000 population		2007 Reported cases and rate per 100 000 population	
				Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria*	N	C	470	470	-	339	-	143	-	263	-	131	-
Belgium*	Y	C	842	842	-	752	-	734	-	718	-	585	-
Bulgaria	Y	A	197	197	2.62	184	2.43	191	2.51	178	2.33	149	1.94
Cyprus*	Y	C	11	11	-	23	-	7	-	2	-	5	-
Czech Republic	Y	C	704	704	6.68	749	7.13	716	6.84	809	7.79	1108	10.77
Denmark	Y	C	501	501	9.01	482	8.71	563	10.22	409	7.47	352	6.46
Estonia	Y	C	166	166	12.39	118	8.81	126	9.4	146	10.89	176	13.11
Finland	Y	C	289	289	5.38	255	4.77	237	4.45	198	3.74	192	3.64
France*	N	C	581	581	-	494	-	392	-	236	-	217	-
Germany	-	-	-	-	-	-	-	-	-	-	-	-	-
Greece	N	A	378	378	3.34	312	2.76	164	1.46	208	1.85	201	1.8
Hungary*	Y	A	1369	1369	-	1170	-	872	-	892	-	1041	-
Ireland	Y	A	834	834	18.61	625	13.99	434	9.75	444	10.09	417	9.67
Italy*	Y	C	407	407	-	402	-	712	-	526	-	612	-
Latvia	Y	C	544	544	24.4	349	15.52	433	19.15	500	22.02	670	29.37
Lithuania	Y	C	248	248	7.64	315	9.46	391	11.67	533	15.83	471	13.91
Luxembourg	Y	C	2	2	0.39	3	0.6	6	1.22	18	3.72	1	0.21
Malta	Y	C	46	46	11.01	48	11.58	62	14.99	50	12.19	52	12.75
Netherlands*	Y	C	3578	3578	-	2815	-	2426	-	1969	-	1830	-
Poland	Y	A	298	298	0.78	301	0.79	402	1.05	285	0.75	330	0.87
Portugal	Y	C	120	111	1.07	89	0.84	114	1.07	67	0.63	74	0.7
Romania	Y	C	521	521	2.43	479	2.23	622	2.89	631	2.93	815	3.78
Slovakia	Y	C	194	194	3.57	132	2.43	172	3.18	152	2.81	81	1.5
Slovenia	Y	C	25	25	1.22	44	2.15	30	1.48	40	1.99	42	2.09
Spain	Y	A	2328	2328	5.04	2306	5.01	1954	4.26	1897	4.19	1698	3.82
Sweden	Y	C	943	943	10.02	848	9.08	610	6.59	722	7.86	642	7.04
United Kingdom	Y	A	23183	23183	37.09	18580	29.95	17400	28.25	16451	26.88	18631	30.65
EU total	-	-	**38779**	**38779**	**12.69**	**32214**	**10.59**	**29913**	**9.98**	**28344**	**9.66**	**30523**	**10.69**
Iceland	Y	C	32	32	10.05	18	5.67	47	14.72	25	7.92	24	7.8
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	368	368	7.48	412	8.48	269	5.61	301	6.35	238	5.08
Total	-	-	**39179**	**39179**	**12.59**	**32644**	**10.54**	**30229**	**9.9**	**28670**	**9.6**	**30785**	**10.58**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.
* Countries with sentinel systems (rates not calculated)

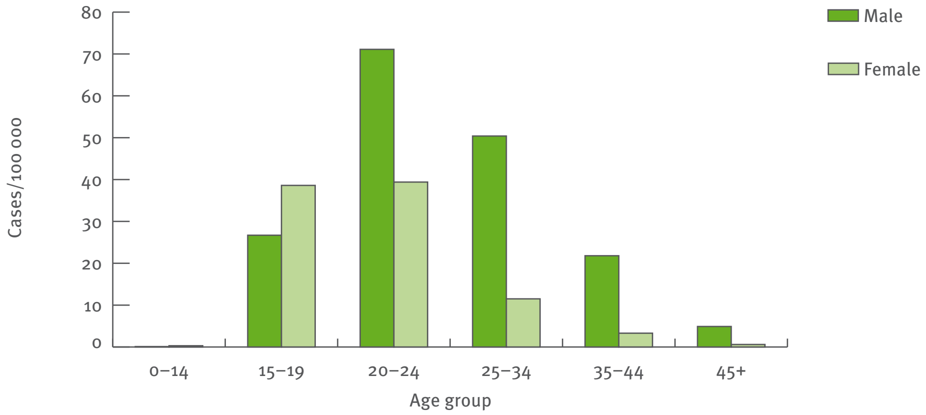
Enhanced surveillance for sexually transmitted infections

The coordination of STI surveillance in the EU/EEA was transferred to ECDC in 2009. More details on the epidemiology and trends of gonorrhoea can be found in ECDC's 2011 STI Surveillance Report[1]. More details on the European Gonococcal Antimicrobial Surveillance Programme (Euro-GASP) can be found in the 2011 Annual Report[2].

Discussion

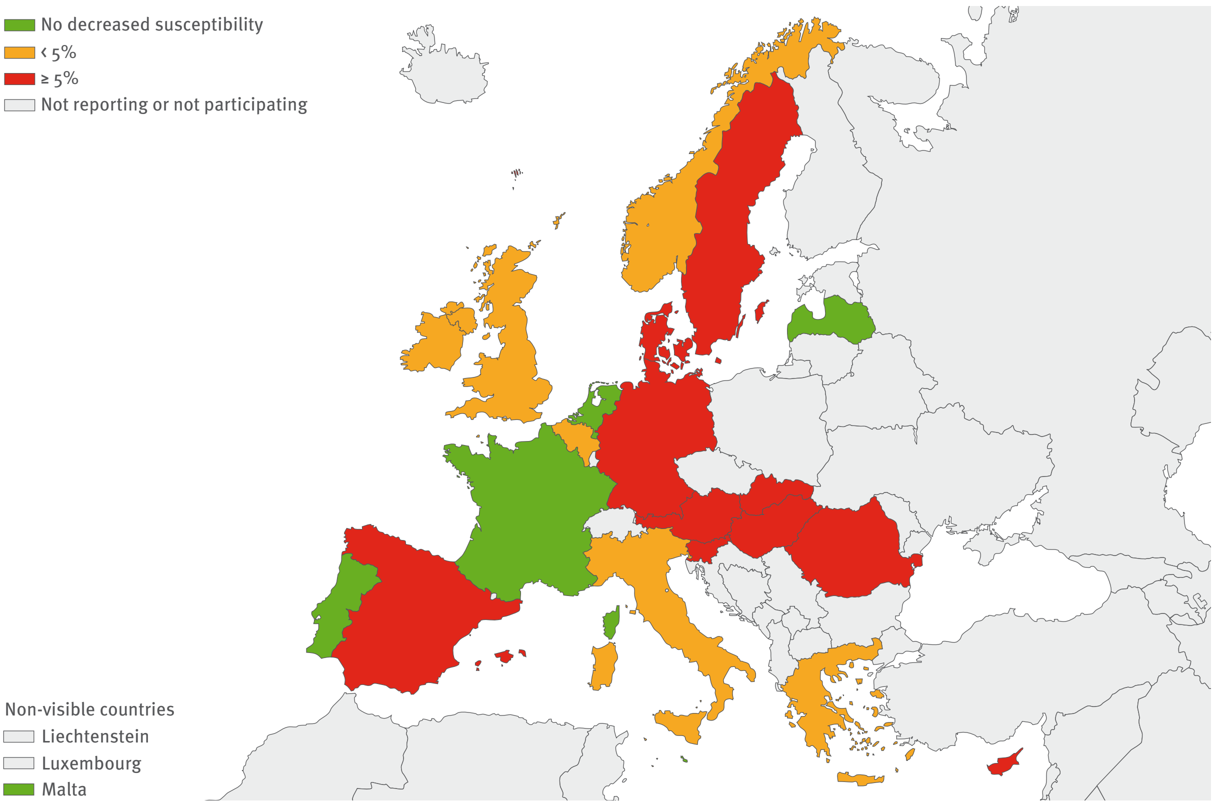
Comparisons between countries are difficult because of differences in testing guidelines and methods, reporting systems, reporting behaviour, and underreporting. It is clear, however, that young adults are an important risk group as they contribute over 40% of cases, with the highest rates in the group of 20–24-year-olds. The male-to-female ratio and the transmission category indicate that transmission among MSM is one of the main modes of transmission across Europe, although this information is not available in all countries. Trends in recent years,

Figure 2.2.3. Rates of confirmed gonorrhoea cases reported in the EU/EEA, by age and gender, 2011



Source: Country reports from Bulgaria, Cyprus, Czech Republic, Finland, Greece, Ireland, Iceland, Italy, Lithuania, Luxembourg, Latvia, Malta, Norway, Portugal, Romania, Sweden, Slovenia, Slovakia and the United Kingdom.

Figure 2.2.4. Susceptibility of gonococcal isolates to cefixime in the EU/EEA, 2011



Source: European Gonococcal Antimicrobial Surveillance Programme (Euro-GASP), 2011 both for Europe and in individual Member States, appear to be increasing. The trend is mainly driven by increased rates among men, particularly MSM[3–5]. The increasing trend may be attributed to the increased uptake of testing, more sensitive diagnostics, and changes in sexual risk behaviour. Further development of behavioural surveillance systems would improve the understanding of the changing epidemiology. There is also a need to strengthen health promotion messages, in particular for affected key populations, to promote safer sexual behaviour, including consistent condom use with new and casual partners.

The high level of decreased susceptibility to cefixime across Europe is extremely disconcerting. As a result, in 2012 the International Union against STI (IUSTI) issued new treatment guidelines for gonorrhoea[6]. The new guidelines recommend treatment with intramuscular ceftriaxone and azithromycin given orally, both as single doses. The detection of isolates with decreased susceptibility to ceftriaxone in the latest Euro-GASP survey is also worrying; it is probably only a matter of time before decreased susceptibility to ceftriaxone becomes widespread in Europe. The European antibiotic resistance sentinel surveillance of *Neisseria gonorrhoeae* is therefore essential to monitor trends and inform treatment guidelines, thus preventing onward transmission and reducing patient morbidity. In 2012, ECDC issued a public health response to control and manage the threat of multidrug-resistant gonorrhoea in Europe, which details needed actions and guides national interventions[7] with the aim of minimising the impact of resistant gonorrhoea in Europe.

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Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by				National coverage	National reference laboratory data	Comparable data available	Case definition used
						Laboratories	Physicians	Hospitals	Others				
Austria	AT-STISentinella	V	Se	A	C	Y	N	N	N	N	-	-	EU-2008
Belgium	BE-LABNET	V	Se	A	C	Y	N	-	-	Y	-	-	Not specified/unknown
Bulgaria	BG-STI	Cp	Co	P	A	-	-	Y	Y	-	-	-	EU-2002
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Czech Republic	CZ-STD	Cp	Co	A	C	N	Y	Y	N	Y	-	-	EU-2008
Denmark	DK-STI_CLINICAL	Cp	Co	P	C	N	Y	N	N	Y	-	-	Other
Estonia	EE-GONOCOCC	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Finland	FI-NIDR	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
France	FR-STI	V	Se	A	C	Y	Y	Y	Y	N	-	-	Not specified/unknown
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	A	Y	Y	Y	N	N	-	-	EU-2008
Hungary	HU-STD SURVEILLANCE	Cp	Se	P	A	N	Y	N	N	Y	-	-	EU-2008
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Ireland	IE-AGGR_STI	Cp	Co	P	A	Y	Y	Y	N	Y	-	-	EU-2002
Italy	IT-NRS	Cp	Co	P	C	N	Y	Y	N	Y	-	-	Other
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Netherlands	NL-STI	V	Se	P	C	N	Y	N	N	Y	-	-	Other
Norway	NO-MSIS_B	Cp	Co	P	C	Y	Y	Y	-	Y	-	-	Not specified/unknown
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	Not specified/unknown
Portugal	PT-GONOCOCCAL	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Romania	RO-RNSSy	Cp	Co	P	A	N	N	Y	N	Y	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y	-	-	EU-2008
Slovenia	SI-SPOSUR	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Spain	ES-STATUTORY_DISEASES_STI_AGGR	Cp	Co	P	A	N	Y	N	N	Y	-	-	Not specified/unknown
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
United Kingdom	UK-GUM	Cp	Co	P	A	N	N	N	Y	Y	-	-	Other

Hepatitis B virus infection

- In 2011, 17 276 cases of hepatitis B virus infection were reported by 28 EU/EEA Member States, a rate of 3.5 per 100 000 population.
- 2 832 (16.4%) of these cases were reported as acute infection and 11 705 (67.8%) cases were chronic hepatitis B.
- In 2011, heterosexual transmission (23.4%), nosocomial transmission (23.2%), injecting drug use (13.4%), and transmission among men who have sex with men (10.3%) were most commonly reported for acute infections. Mother-to-child transmission was the most common route (67.3%) for chronic cases.
- The most affected age group is the 25–23-year age range, which accounts for 32.9 % of the total number of cases; incidence rate is 8.8 cases per 100 000 in men and 7.7 cases per 100 000 in women.
- Geographic trends and trends over time are difficult to interpret because of different reporting practices and case definitions. The problem is aggravated by the variation in immunisation and screening programmes between countries.

Hepatitis B is a blood-borne virus that is associated with substantial morbidity and mortality. Acute infection is often asymptomatic, particularly in children, but may be associated with an acute hepatitis and can result in chronic infection which can lead to cirrhosis of the liver, end-stage liver disease and liver cancer. In most European countries, transmission of hepatitis B infection is through sexual contact and injecting drug use.

Epidemiological situation in 2011

In 2011, 28 EU/EEA Member States reported 17 276 cases of hepatitis B virus infection (no data from Belgium and Liechtenstein), a rate of 3.5 cases per 100 000 population (Table 2.2.3).

Of all cases reported in 2011, 2 832 cases (16.4%) were reported as acute and 11 705 (67.8%) were chronic, while 2 395 (13.9%) were classified as unknown; 344 cases (2.0%) could not be classified.

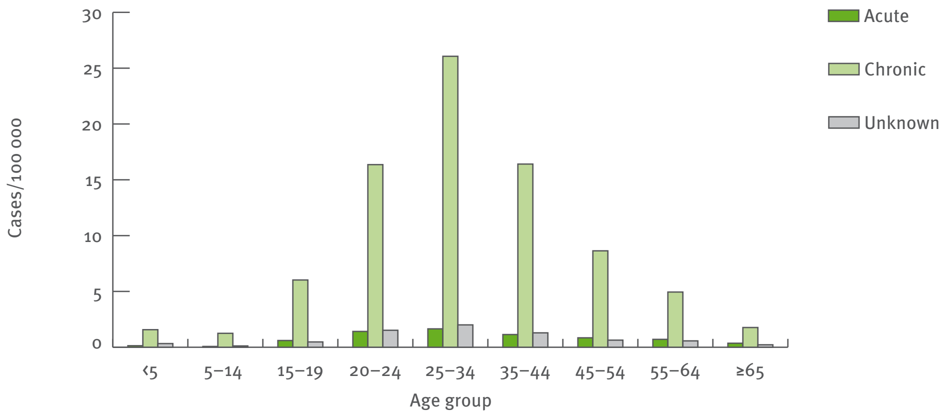
In 2011, 23 countries were able to provide data on acute cases in 2011, ranging from one case in Portugal and two cases in in Iceland to 688 cases in Germany. The rate of acute cases ranged from <0.1 in Portugal to 2.4 cases per 100 000 in Latvia. The overall reporting rate for acute cases of hepatitis B (0.8 per 100 000) was considerably lower than the rate for chronic cases (8.1 per 100 000). In 2011, fourteen countries were able to provide data on chronic cases. Rates of chronic infections ranged from <0.1 case per 100 000 in Romania to 14.4 per 100 000 in Norway. The number of chronic infections ranged from just one case in Romania to 6 589 in the United Kingdom.

Age and gender distribution

In 2011, 9 929 of all reported cases were in men (4.2 per 100 000) while 7 016 cases were in women (2.9 per 100 000). This represents a male-to-female rate ratio of 1.5:1.

One third of all reported hepatitis B cases were in the 25–34 age group (33.2%). The highest rates in both males and females were in this age group at 8.8 per 100 000 in males and 7.4 per 100 000 in females. The age distribution among reported cases of acute and chronic infections were similar, but chronic cases had a slightly younger age profile, with 57.4% of the chronic cases

Figure 2.2.5. Number of reported hepatitis B cases (acute, chronic and unknown), by age group and gender, EU/EEA, 2011



Source: Country reports from Austria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Latvia, Malta, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom (excluding Scotland).

reported in people under 35 years of age, compared with 43.9% of acute cases (see Figure 2.2.5).

Transmission

In 2011, heterosexual transmission was reported as the most common route of transmission (23.4%) for acute cases, followed by nosocomial transmission (23.2%), injecting drug use (13.4%) and transmission in men who have sex with men (10.3%). Mother-to-child transmission was the most common route (67.3%) for chronic cases, followed by other routes (9.3%) and heterosexual transmission (6.1%).

Discussion

In 2011, ECDC implemented enhanced hepatitis B surveillance. It is difficult to interpret the data because of the diversity in surveillance systems and case definitions; this is aggravated by differences in reporting practices, with several countries only collecting data on acute cases. Although 18 countries were able to provide data (based on the EU 2012 case definition) for 2011, five countries only submitted data on acute cases. Countries which provided hepatitis B data according to previous EU case definitions (EU 2008 and EU 2002) only submitted data on acute cases. Four countries (Denmark, Germany, Italy and Luxembourg) provided data according to their national case definitions.

Countries which reported both acute and chronic cases reported markedly more chronic than acute cases. The reporting rate for acute cases has declined over time, which is likely to be related to the ongoing implementation of vaccination programmes across Europe. With regard to chronic cases, data show a rise in the number and rate. This increase may reflect testing and screening practices among key populations.

It is likely that the variation between countries reflects the differences in testing as well as underlying epidemiological differences between countries. Migration is also a key factor underlying the high numbers of chronic hepatitis B cases in a number of countries.

Table 2.2.3. Numbers and rates of reported hepatitis B cases in the EU/EEA, 2008–2011†

Country	Case definition for 2011 data	2011*								2010*		2009*		2008*	
		Total		Acute		Chronic		Unknown		Total		Total		Total	
		Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	EU 2008	825	9.8	102	1.2	551	6.6	172	2	136	1.6	45	0.5	43	0.5
Belgium	-	-	-	-	-	-	-	-	-	-	-	129	1.2	122	1.1
Bulgaria**	EU 2002	344	4.6	-	-	-	-	-	-	387	5.1	504	6.6	624	8.2
Cyprus**	EU 2008	10	1.2	-	-	-	-	10	1.2	7	0.9	7	0.9	7	0.9
Czech Republic	EU 2012	191	1.8	191	1.8	-	-	-	-	244	2.3	247	2.4	304	2.9
Denmark	National	264	4.7	17	0.3	243	4.4	4	0.1	170	3.1	180	3.3	204	3.7
Estonia	EU 2012	42	3.1	15	1.1	27	2	-	-	58	4.3	60	4.5	75	5.6
Finland	EU 2012	248	4.6	24	0.4	224	4.2	-	-	286	5.3	360	6.8	318	6
France††	EU 2012	101	0.2	101	0.2	-	-	-	-	86	0.1	94	0.1	130	0.2
Germany	National	793	1	688	0.8	-	-	105	0.1	762	0.9	743	0.9	820	1
Greece	EU 2008	38	0.3	38	0.3	-	-	-	-	35	0.3	52	0.5	80	0.7
Hungary	EU 2012	65	0.7	65	0.7	-	-	-	-	60	0.6	67	0.7	88	0.9
Ireland	EU 2012	514	11.5	43	1	450	10	21	0.5	649	14.5	795	17.9	897	20.4
Italy	National	428	0.7	-	-	-	-	428	0.7	629	1	778	1.3	788	1.3
Latvia	EU 2012	289	13	54	2.4	57	2.6	178	8	321	14.3	433	19.1	558	24.6
Lithuania	EU 2012	60	1.8	60	1.8	-	-	-	-	71	2.1	58	1.7	90	2.7
Luxembourg**	National	16	3.1	-	-	-	-	16	3.1	18	3.6	19	3.9	21	4.3
Malta	EU 2012	35	8.4	3	0.7	32	7.7	-	-	20	4.8	22	5.3	4	1
Netherlands	EU 2012	1715	10.3	154	0.9	1523	9.1	38	0.2	1786	10.8	598	3.6	239	1.5
Poland	EU 2008	104	0.3	104	0.3	-	-	-	-	128	0.3	199	0.5	262	0.7
Portugal	EU 2012	26	0.2	1	<0.1	-	-	25	0.2	16	0.2	67	0.6	53	0.5
Romania	EU 2012	411	1.9	410	1.9	1	<0.1	-	-	486	2.3	586	2.7	710	3.3
Slovakia	EU 2012	169	3.1	93	1.7	76	1.4	-	-	209	3.9	230	4.2	185	3.4
Slovenia	EU 2012	69	3.4	25	1.2	44	2.1	-	-	42	2.1	43	2.1	54	2.7
Spain**	EU 2008	522	1.1	-	-	-	-	522	1.1	662	1.4	710	1.5	758	1.7
Sweden	EU 2012	1333	14.2	89	0.9	1181	12.5	63	0.7	1571	16.8	1481	16	1481	16.1
United Kingdom***	EU 2012	7876	14	497	0.9	6589	11.7	790	1.4	6036	10.7	6241	11.1	5639	10
EU total	-	**16488**	**3.4**	**2774**	**0.8**	**10998**	**7.9**	**2372**	**0.8**	**14875**	**3.1**	**14748**	**3.0**	**14554**	**3.0**
Iceland	EU 2012	25	7.9	2	0.6	-	-	23	7.2	29	9.1	23	7.2	61	19.3
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	EU 2012	763	15.5	56	1.1	707	14.4			765	15.7	890	18.5	782	16.5
Total	-	**17276**	**3.5**	**2832**	**0.8**	**11705**	**8.1**	**2395**	**0.8**	**15669**	**3.2**	**15661**	**3.1**	**15397**	**3.1**

Source: Country reports and Eurostat population data; United Kingdom population data: Office for National Statistics (mid-2008 population figures for all years; population data for Scotland not included).
† Comparisons between Member States and across years should be made with caution because of significant differences in the surveillance systems.
†† Underreporting of cases occurs in many countries and was estimated to be as high as 51% (France, 2005).
* Year according to 'date of diagnosis' variable. Case numbers may differ from those reported in national bulletins as different date variables are used.
** Data submitted use previous record type version; no classification of data by disease status.
*** Excludes data from Scotland.

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Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by				National coverage
						Laboratories	Physicians	Hospitals	Others	
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	Y
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	Y
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y
Denmark	DK-MIS	Cp	Co	P	C	N	Y	N	N	Y
Estonia	EE-HBV/GIARDIASIS	Cp	Co	P	C	Y	Y	Y	Y	Y
Finland	FI-NIDR	Cp	Co	P	C	Y	Y	N	N	Y
France	FR-MANDATORY_INFECTIOUS_DISEASES	Cp	Co	P	C	Y	Y	Y	Y	Y
Germany	DE-SURVNET@RKI-7.1/6	Cp	Co	P	C	Y	Y	Y	Y	Y
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y
Hungary	HU-EFRIR	Cp	Co	P	C	Y	Y	Y	N	Y
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	N	Y
Ireland	IE-CIDR	Cp	Co	P	C	Y	Y	Y	N	Y
Italy	IT-NRS	Cp	Co	P	C	N	Y	Y	N	Y
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	Y	Y	N	N	Y
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y
Netherlands	NL-OSIRIS	Cp	Co	P	C	Y	Y	N	N	Y
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	Y
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	N	Y	Y	N	Y
Portugal	PT-HEPATITISB	Cp	Co	P	C	N	Y	N	N	Y
Romania	RO-RNSSy	Cp	Co	P	C	Y	N	Y	N	Y
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y
Spain	ES-STATUTORY_DISEASES	Cp	Co	P	C	N	Y	Y	N	Y
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y
United Kingdom	UK-HEPATITISB	O	Co	P	C	Y	N	Y	N	Y

Hepatitis C virus infection

- In 2011, 30 373 cases of hepatitis C were reported by 26 EU/EEA Member States, a rate of 7.9 per 100 000 population.
- Of cases reported in 2011, 440 cases (1.4%) were reported as acute, 3 174 (10.5%) as chronic, and 24 493 (80.6%) as unknown.
- The overall male-to-female ratio was 1.9:1. The most affected age group is the between 25 and 34 years, accounting for 28.2% of all cases, with a rate of 21.5 cases per 100 000 in men and 10.3 cases per 100 000 in women.
- The most common route of transmission in 2011 was injecting drug use, accounting for 78.1% of all cases with complete information.
- Interpretation of data between countries is complex because of differences in surveillance systems and case definitions. These differences are aggravated by variations in testing methodology between countries.

Hepatitis C is a blood-borne virus associated with substantial morbidity and mortality. Infection with the virus results in an acute phase which is asymptomatic for the majority of individuals. Some of those infected with the virus will naturally clear the virus from their body. However, in around 80% of cases, acute infection progresses to chronic infection, which may lead to cirrhosis and liver cancer.

Epidemiological situation in 2011

In 2011, 30 373 cases of hepatitis C virus (HCV) infection were reported by 26 EU/EEA Member States (Belgium, France, Liechtenstein and Spain did not report); the incidence rate was 7.9 cases per 100 000 population (Table 2.2.4).

In 2011, 15 countries were able to provide data using the revised case definition (EU 2012), three (Hungary, Malta, Lithuania) could only provide data on acute infections; 12 countries were able to classify cases as acute or chronic, with 80.6% of cases being classified as unknown. It is likely that the majority of these unknown cases are chronic cases.

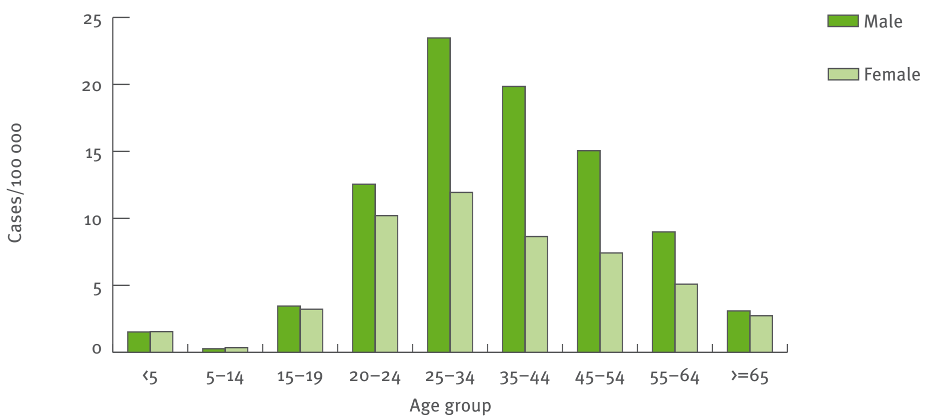
In 2011, the overall number of cases reported by countries ranged from 18 cases in Malta (4.3 cases per 100 000) and Greece (0.2 cases per 100 000) to 12 196 (19.5 cases per 100 000) in the United Kingdom. Eleven countries provided data on acute cases of hepatitis C in 2011. The number of acute cases ranged from two cases in Portugal (<0.1 cases per 100 000) to 213 cases in Austria (2.5 cases per 100 000). Eight countries reported chronic cases in 2011. The number of chronic cases varied from six cases in Greece (0.1 cases per 100 000) to 1 496 cases in the United Kingdom (2.4 cases per 100 000). The highest rate of reported chronic infections was observed in Estonia, which reported 188 cases (14.0 cases per 100 000).

There are no obvious time or geographical trends in the number of acute, chronic or 'unknown' hepatitis C cases.

Age and gender distribution

In 2011, 19 495 of all reported cases were male (12.1 cases per 100 000) and 10 523 cases were female (6.3 cases per 100 000) – a male-to-female rate ratio of 1.9:1. For every age group (except those aged 0–5 and 5–14 years) the rates were considerably higher among men than women.

Figure 2.2.6. Number of reported hepatitis C cases (acute, chronic and unknown), by age group and gender, EU/EEA, 2011



Source: Country reports from Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and the United Kingdom.

In 2011, just over a half of all hepatitis C cases reported were aged between 25 and 44 (53.5% of cases), and 11.0% of cases were younger than 25 years of age. The notification rate was highest for both males and females in the 25–34 age group (23.5 cases per 100 000 in men and 11.9 per 100 000 in women).

Transmission

The most commonly reported route of transmission was injecting drug use, accounting for 78.1% of all cases with known transmission route in 2011. Injecting drug use was the most common route of transmission in both acute and chronic cases, although this route was less dominant among acute cases (33.3%) than among chronic cases (83.7%). Among acute cases, the other main routes of transmission included nosocomial transmission (16.9%) and men who have sex with men (24.4%).

Discussion

In 2011, enhanced surveillance of hepatitis B and C was implemented. The interpretation of data is complicated by differences in national surveillance systems including case definitions used and reporting practices, with countries reporting data on acute cases only. In addition to these problems, many countries had difficulties in defining cases as either acute or chronic. Acute cases are difficult to diagnose clinically, and serological classification is not straightforward. Chronic infection may not present with any symptoms for up to 15 to 20 years; thus, data on newly diagnosed chronic hepatitis C cases are largely driven by testing practices, which vary considerably across the EU. Apart from the differences in surveillance systems, it is likely that much of the variation in reported cases between countries reflects differences in testing and screening programmes among risk groups as well as the underlying epidemiological differences between countries.

Table 2.2.4. Numbers and rates of reported hepatitis C cases in the EU/EEA, 2008–2011†

Country	Case definition for 2011 data	2011*								2010*		2009*		2008*	
		Total		Acute		Chronic		Unknown		Total		Total		Total	
		Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	EU 2008	1266	15.1	213	2.5	751	8.9	284	3.4	243	2.9	277	3.3	271	3.3
Belgium	-	-	-	-	-	-	-	-	-	-	-	34	0.3	43	0.4
Bulgaria**	EU 2008	60	0.8	-	-	-	-	-	-	58	0.8	93	1.2	89	1.2
Cyprus**	EU 2008	54	6.4	-	-	-	-	54	6.4	26	3.2	33	4.1	2	0.3
Czech Republic	EU2008	812	7.7	-	-	-	-	812	7.7	709	6.7	836	8	974	9.4
Denmark	National	291	5.2	7	0.1	280	5.0	4	0.1	318	5.7	295	5.4	320	5.8
Estonia	EU 2012	204	15.2	16	1.2	188	14.0	-	-	276	20.6	227	16.9	200	14.9
Finland	EU 2012	1135	21.1	-	-	-	-	1135	21.1	1138	21.3	1047	19.7	1144	21.6
France	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Germany	EU 2012	4902	6	-	-	-	-	4902	6	5276	6.4	5412	6.6	6218	7.6
Greece	EU 2008	18	0.2	11	0.1	6	0.1	1	0	11	0.1	10	0.1	18	0.2
Hungary	EU 2012	40	0.4	40	0.4	-	-	-	-	11	0.1	31	0.3	33	0.3
Ireland	EU 2012	1248	27.9	11	0.2	94	2.1	1143	25.5	1238	27.7	1243	27.9	1501	34.1
Italy	National	172	0.3	-	-	-	-	172	0.3	185	0.3	215	0.4	266	0.4
Latvia	EU 2012	1217	54.6	-	-	-	-	1217	54.6	1141	50.7	1317	58.2	1490	65.6
Lithuania	EU 2012	43	1.3	43	1.3	-	-	-	-	41	1.2	47	1.4	43	1.3
Luxembourg**	National	74	14.5	-	-	-	-	74	14.5	73	14.5	55	11.1	58	12
Malta	EU 2012	18	4.3	-	-	-	-	18	4.3	14	3.4	26	6.3	1	0.2
Netherlands	EU 2008	65	0.4	65	0.4	-	-	-	-	30	0.2	50	0.3	48	0.3
Poland	EU 2008	2188	5.7	-	-	-	-	-	-	2178	5.7	1939	5.1	2353	6.2
Portugal	National	45	0.4	2	<0.1	-	-	43	0.4	39	0.4	85	0.8	46	0.4
Romania	EU 2012	80	0.4	-	-	-	-	80	0.4	76	0.4	66	0.3	101	0.5
Slovakia	EU 2012	296	5.4	21	0.4	275	5.1	-	-	237	4.4	318	5.9	332	6.1
Slovenia	EU 2012	95	4.6	11	0.5	84	4.1	-	-	87	4.3	111	5.5	82	4.1
Spain**	-	-	-	-	-	-	-	-	-	-	-	-	-	129	0.3
Sweden	EU 2012	2106	22.4	-	-	-	-	2106	22.4	1931	20.7	2173	23.5	2474	26.9
United Kingdom	EU 2012	12196	19.5	-	-	1496	2.4	10700	17.1	9952	16	10708	17.4	10298	16.8
EU total	**-**	**28625**	**7.5**	**440**	**0.6**	**3174**	**3.1**	**22745**	**7.7**	**25288**	**6.7**	**26648**	**6.8**	**28534**	**6.6**
Iceland	EU 2012	72	22.6	-	-	-	-	72	22.6	59	18.6	103	32.3	93	29.5
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	EU 2012	1676	34.1	-	-	-	-	1676	34.1	1784	36.7	2292	47.8	3334	70.4
Total	**-**	**30373**	**7.9**	**440**	**0.6**	**3174**	**3.1**	**24493**	**8.1**	**27131**	**7.1**	**29043**	**7.4**	**31961**	**7.3**

Source: Country reports and Eurostat data
† Comparisons between Member States and across years should be made with caution because of significant differences in the surveillance systems.
* Year according to 'date of diagnosis' variable. Case numbers may differ from those reported in national bulletins as different date variables are used.
** Data submitted use previous record type version; no classification of data by disease status.

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2. European Centre for Disease Prevention and Control. Hepatitis B and C in the EU neighbourhood: prevalence, burden of disease and screening policies. Stockholm: ECDC; 2010.
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Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by				National coverage
						Laboratories	Physicians	Hospitals	Others	
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	Y
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	Y
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y
Denmark	DK-MIS	Cp	Co	P	C	N	Y	N	N	Y
Estonia	EE-HCV/CHLAMYDIA	Cp	Co	P	C	Y	Y	Y	Y	Y
Finland	FI-NIDR	Cp	Co	P	C	Y	Y	N	N	Y
Germany	DE-SURVNET@RKI-7.1/6	Cp	Co	P	C	Y	Y	Y	Y	Y
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y
Hungary	HU-EFRIR	Cp	Co	P	C	Y	Y	Y	N	Y
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	N	Y
Ireland	IE-CIDR	Cp	Co	P	C	Y	Y	Y	N	Y
Italy	IT-NRS	Cp	Co	P	C	N	Y	Y	N	Y
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	Y	Y	N	N	Y
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y
Netherlands	NL-OSIRIS	Cp	Co	P	C	Y	Y	N	N	Y
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	Y
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	A	N	Y	Y	N	Y
Portugal	PT-HEPATITISC	Cp	Co	P	C	N	Y	N	N	Y
Romania	RO-RNSSy	Cp	Co	P	C	Y	N	Y	N	Y
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y
United Kingdom	UK-HEPATITISC	O	Co	A	C	Y	N	Y	N	Y

HIV/AIDS

- HIV infection is a major public health concern in EU/EEA countries, characterised by continuously rising case numbers. By contrast, the overall number of AIDS cases has continued to decline, although in some eastern EU countries the number of AIDS cases continues to increase.
- In 2011, 28 038 diagnosed cases of HIV infections were reported in 29 EU/EEA Member States, a rate of 5.7 per 100 000 population. This number is likely to be higher due to the delay in reporting of HIV diagnoses in a number of countries.
- The highest proportion was reported among men who have sex with men (39%); heterosexual contact accounted for 36% of all cases (including 13% in cases from countries with generalised HIV epidemics), and injecting drug use for 5%.
- The overall rate was relatively stable, ranging from 6.5 cases per 100 000 population in 2004 to 5.7 per 100 000 in 2011. When adjusted for reporting delay, the rate would increase to 6.3 cases per 100 000 in 2011.

Human immunodeficiency virus (HIV) is a retrovirus which causes acquired immunodeficiency syndrome (AIDS), characterised as progressive failure of the immune system, leaving the human body vulnerable to life-threatening opportunistic infections and cancers. The modes of transmission include unprotected sexual intercourse, sharing of needles and syringes for injecting drugs, mother-to-child transmission, and the transfusion of contaminated blood or its products.

Epidemiological situation in 2011

In 2011, 28 038 HIV diagnoses were reported by 29 EU/EEA countries (no data from Liechtenstein), a rate of 5.7 per 100 000 population (Table 2.2.5). The countries with the highest rates of HIV cases were Estonia (27.3), Latvia (13.4), Belgium (10.7), and the United Kingdom (10.0). The lowest rates were reported by the Czech Republic (1.5) and Slovakia (0.9).

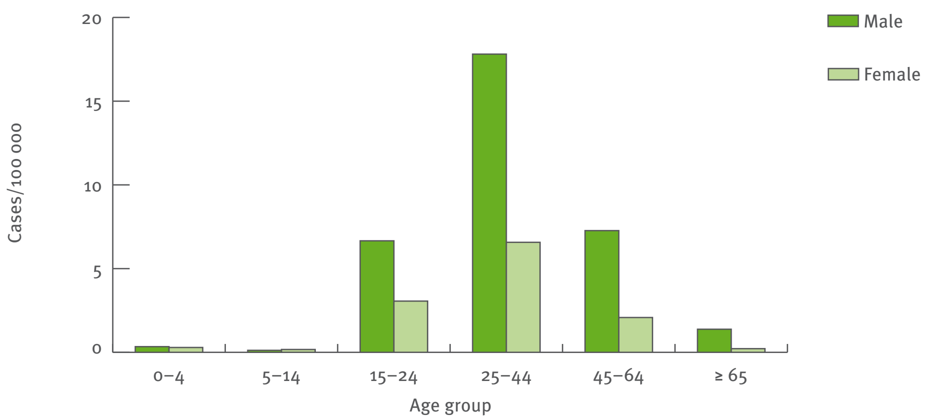
The rate of HIV infections per 100 000 population has been stable over time, ranging from 6.5 cases per 100 000 in 2004 to 5.7 per 100 000 in 2011; if adjusted for reporting delay, this rate rises to 6.3 cases per 100 000. Since 2004, rates of HIV cases have more than tripled in Bulgaria, Iceland and Slovakia and more than doubled in the Czech Republic; an increase of more than 50% was reported in Romania, Greece and Cyprus. It should be noted that the number of reported HIV cases in recent years was also affected by reporting delays.

Age and gender distribution

In 2011, HIV was reported three times more frequently among men than women, with case rates of 8.7 and 2.8 per 100 000, respectively. The overall male-to-female ratio was 3.0. The ratio was highest in Slovakia (15.3), Hungary (11.1) and the Czech Republic (10.8). The male-to-female ratio was higher than five in Germany, Greece, Malta, the Netherlands, Poland, Slovenia and Spain.

In 2011, information on age and gender was available for 99.3% of cases; 11% of HIV infections were reported in young adults aged 15–24 years, and one third of the cases were reported in the age group 30–39 years. The highest age-specific rates were observed among 25–44-year-olds (Figure 2.2.7). On average, men were older at the time of HIV diagnosis than women.

Figure 2.2.7. Rates of newly diagnosed cases of HIV infection reported in the EU/EEA, by age and gender, 2011



Source: Country reports from Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Transmission category

Data on transmission mode indicate that men who have sex with men (MSM) account for 39% of all reported HIV infections. Heterosexual transmission accounted for 36% of infections; this includes 13% in cases from countries with generalised HIV epidemics. Injecting drug use accounted for 5% of the reported HIV infections in 2011. Transmission mode was reported as unknown for 19%. One per cent of reported HIV cases included mother-to-child transmission, nosocomial infection, and transfusion of blood or blood products.

Since 2004, 25 EU/EEA countries have consistently reported data on transmission mode. Adjusted trends by transmission mode and in total for the EU/EEA are presented in Figure 2.2.8.

The number of HIV infections among MSM has increased by 33%, from 6 589 cases in 2004 to 8 768 in 2010, and 8 018 in 2011. More than half of the HIV cases were reported among MSM in nine countries: the Czech Republic, Cyprus, Germany, Hungary, Luxembourg, the Netherlands, Slovakia, Slovenia, and Spain.

Heterosexually acquired infections (excluding cases originating from countries with generalised HIV epidemics) decreased from 11 920 in 2004 to 8 910 in 2010 and 7 512 in 2011. The number of cases originating from sub-Saharan countries, where the HIV epidemic is generalised, decreased by 41% between 2010 (4 064 cases) and 2011 (3 159 cases).

HIV infections due to injecting drug use have declined from 1 572 (2004) to 946 (2010) infections; in 2011, the numbers increased to 1 091 infections. In most countries the numbers reported among IDU were low or decreasing; however, in Greece and Romania the number increased more than ten times in 2011 compared with 2010. In Bulgaria, Lithuania and Iceland, a more gradual increase was recorded over the last three years.

The number of HIV infections transmitted from mother to child decreased by 16%, from 295 (2004) to 247 (2010) and then down to 188 infections in 2011.

The number of HIV infections due to nosocomial transmission increased from 16 cases in 2004 to 21 in 2010 and 19 in 2011. The number due to transfusion of blood and its products has decreased by 48% since 2004:

Table 2.2.5. Numbers and rates of newly diagnosed HIV infections in the EU/EEA, 2004–2011

Country	2011		2010		2009		2008		2007		2006		2005		2004	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	293	3.5	303	3.6	294	3.5	346	4.2	336	4.1	320	3.9	325	4	330	4.1
Belgium	1177	10.7	1198	11.1	1134	10.5	1093	10.2	1070	10.1	1018	9.7	1069	10.2	1002	9.6
Bulgaria	201	2.7	163	2.2	171	2.2	123	1.6	126	1.6	91	1.2	83	1.1	50	0.6
Cyprus	54	6.4	41	5	38	4.8	37	4.7	46	5.9	35	4.6	42	5.6	25	3.4
Czech Republic	153	1.5	180	1.7	156	1.5	148	1.4	121	1.2	91	0.9	90	0.9	72	0.7
Denmark	266	4.8	275	5	236	4.3	285	5.2	306	5.6	245	4.5	264	4.9	306	5.7
Estonia	366	27.3	376	28.1	411	30.7	545	40.6	633	47.2	668	49.7	621	46.1	743	55
Finland	178	3.3	185	3.5	181	3.4	149	2.8	190	3.6	191	3.6	143	2.7	122	2.3
France	4075	6.3	5518	8.5	5435	8.4	5747	9	5667	8.9	5686	9	5984	9.5	5761	9.2
Germany	2887	3.5	2919	3.6	2885	3.5	2850	3.5	2800	3.4	2666	3.2	2508	3	2224	2.7
Greece	837	7.4	617	5.5	588	5.2	598	5.3	549	4.9	497	4.5	535	4.8	490	4.4
Hungary	162	1.6	182	1.8	140	1.4	145	1.4	119	1.2	81	0.8	106	1	75	0.7
Iceland	23	7.2	24	7.6	15	4.7	10	3.2	13	4.2	11	3.7	8	2.7	4	1.4
Ireland	321	7.2	330	7.4	395	8.9	405	9.2	391	9.1	353	8.4	326	7.9	358	8.9
Italy*	3461	5.8	3737	6.3	2588	4.8	2038	5.5	1960	6.3	1805	7.5	1496	7.7	1667	8.7
Latvia	299	13.4	274	12.2	275	12.2	359	15.8	353	15.5	299	13	299	13	324	14
Lithuania	166	5.1	153	4.6	180	5.4	95	2.8	106	3.1	100	2.9	120	3.5	135	3.9
Luxembourg	44	8.6	48	9.6	54	10.9	54	11.2	43	9	50	10.7	51	11.1	60	13.2
Malta	21	5	18	4.3	19	4.6	28	6.8	14	3.4	24	5.9	15	3.7	16	4
Netherlands	1019	6.1	1127	6.8	1157	7	1266	7.7	1207	7.4	1104	6.8	1205	7.4	1168	7.2
Norway	269	5.5	258	5.3	282	5.9	299	6.3	248	5.3	276	5.9	219	4.8	251	5.5
Poland	966	2.5	925	2.4	950	2.5	837	2.2	806	2.1	810	2.1	697	1.8	673	1.8
Portugal	902	8.5	1442	13.6	1658	15.6	1895	17.8	1843	17.4	1895	17.9	1832	17.4	1990	19
Romania	394	1.8	260	1.2	245	1.1	251	1.2	168	0.8	184	0.9	228	1.1	242	1.1
Slovakia	49	0.9	28	0.5	53	1	53	1	39	0.7	27	0.5	21	0.4	15	0.3
Slovenia	55	2.7	35	1.7	48	2.4	48	2.4	37	1.8	33	1.6	38	1.9	24	1.2
Spain*	2759	8.4	3274	10	3148	9.6	3054	10.9	2517	10.4	1745	9.7	1620	9.2	1661	9.5
Sweden	370	3.9	502	5.4	414	4.5	399	4.3	466	5.1	378	4.2	381	4.2	420	4.7
United Kingdom	6271	10	6360	10.3	6638	10.8	7249	11.8	7358	12.1	7463	12.4	7910	13.2	7788	13
Total	**28038**	**5.7**	**30752**	**6.3**	**29788**	**6.1**	**30406**	**6.6**	**29532**	**6.5**	**28146**	**6.4**	**28236**	**6.5**	**27996**	**6.5**

Source: Country reports
Note: Levels of underreporting of cases vary significantly between countries; conclusions from comparisons between countries should be drawn with caution.
* Subnational reporting, rate calculated based on sub-national coverage
** Rate of 6.3 per 100 000 when adjusted for reporting delay

from 87 cases in 2004 to 61 in 2010 and then down to 47 cases in 2011.

The number of cases with unknown risk factors has increased by 26%, from 2773 in 2004 to 3487 in 2010, reaching 3611 cases in 2011.

Late diagnoses

In 2011, 21 countries provided information on CD4 cell count at time of HIV diagnosis. CD4 cell counts were available for 56% of the reported HIV cases. Almost half (49%) of these cases were late presenters (CD4 cell count less than 350/mm^3), including 29% of cases with advanced HIV infection (CD4 cell count <200/mm^3). By transmission mode, the highest proportion of late presenters was observed among heterosexually acquired cases, especially among those originating from sub-Saharan countries (63%). The lowest proportion of CD4 cell counts below 350/mm^3 as well as CD4 cell counts below 200/mm^3 was observed among cases attributed to mother-to-child transmission (21% and 14%) and MSM (38% and 19%) (Figure 2.2.9).

AIDS diagnoses

In 2011, 4424 diagnoses of AIDS were reported by 28 EU/EEA countries (no data from Sweden or Liechtenstein), a rate of 0.9 per 100000 population. The highest rates were reported by Latvia (4.8), Portugal (2.8), Spain (1.8) and Estonia (2.8). Overall, a 33% decrease from 1.9 cases (2004) per 100000 to 1.2 cases (2010) was observed. However an increase of more than 20% since 2004 was reported in Bulgaria, the Czech Republic, Estonia and Hungary.

Discussion

Surveillance data suggest that the HIV epidemic is evolving with diverse transmission patterns across countries. The number of people living with HIV and AIDS is steadily increasing; HIV/AIDS continues to be an important public health problem. HIV is concentrated in key populations at increased risk, such as MSM, migrant populations and injection drug users[1] (IDU).

In the EU/EEA, men who have sex with men account for the majority of the HIV diagnoses. Although the number of HIV reported in IDU were very low, the recent HIV outbreaks among IDU in Greece and Romania signal the

Figure 2.2.8. Number of newly diagnosed cases of HIV infection (adjusted for reporting delay), by transmission mode, origin and year, EU/EEA, 2004–2011

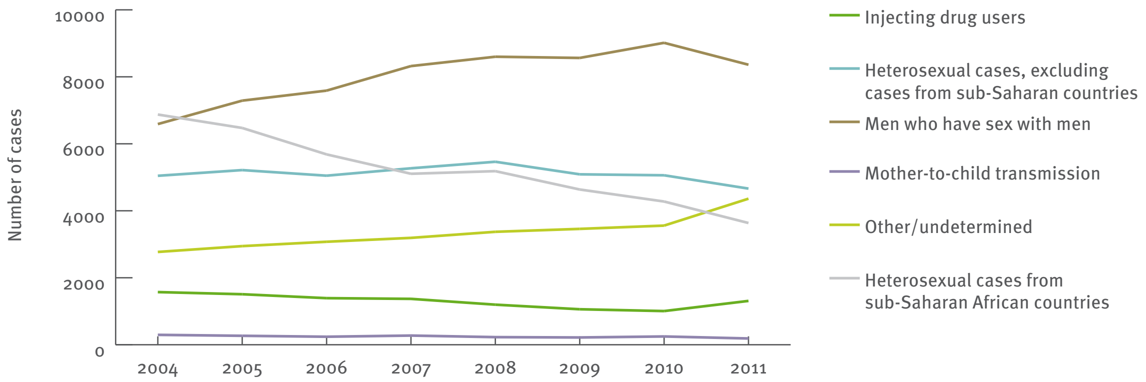
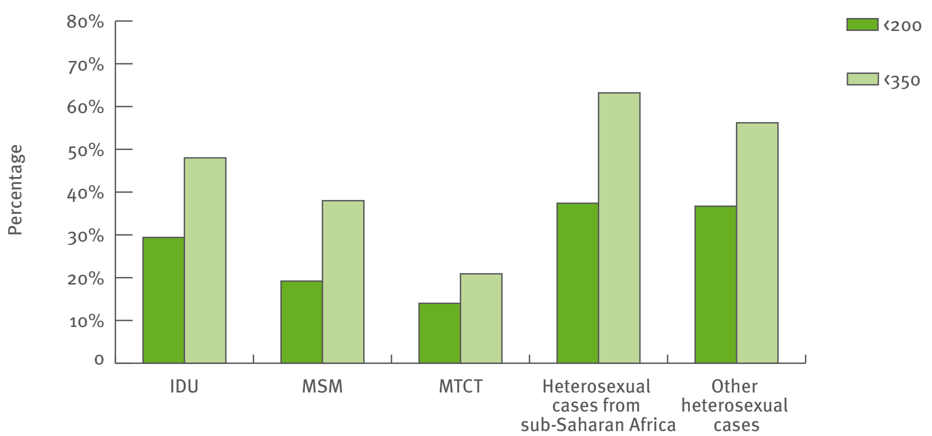


Figure 2.2.9. Percentage of CD4 cell count (<350/mm3 and <200/mm3), by mode of transmission, EU/EEA, 2011 (n=15625)



Source: Country reports from Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

potential for a rapid spread of HIV in vulnerable populations when preventive measures are not in place. The decreasing trend of heterosexually acquired HIV cases originating from countries with generalised epidemics may point towards multiple causes, for example recent migration patterns, the effect of preventive measures in these populations, or decreased access to testing and preventive services.

It is of concern that half of the HIV cases with information on CD4 cell counts are late presenters, diagnosed with a low CD4 cell count (<350/mm³); this reflects the lack of accurate testing practices that still exist in many countries. Late presenters cannot benefit from available treatment and care regimes and can have contributed to transmitting the virus further.

References

1. European Centre for Disease Prevention and Control; WHO Regional Office for Europe. HIV/AIDS surveillance in Europe 2011. Stockholm: ECDC; 2012.

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by				National coverage
						Laboratories	Physicians	Hospitals	Others	
Belgium	BE-HIV/AIDS	V	Co	A	C	Y	Y	Y	N	Y
Bulgaria	BG-HIV	Cp	Co	P	C	Y	N	N	N	Y
Cyprus	CY-HIV/AIDS	Cp	Co	A	C	N	N	N	Y	Y
Czech Republic	CZ-HIV/AIDS	Cp	Co	A	C	Y	Y	Y	N	Y
Denmark	DK-HIV	Cp	Co	P	C	Y	Y	N	N	Y
Estonia	EE-HIV	Cp	Co	P	C	Y	Y	Y	N	Y
Finland	FI-NIDR	Cp	Co	P	C	Y	Y	N	N	Y
France	FR-MNOID-HIV	Cp	Co	P	C	Y	Y	Y	N	Y
Germany	DE-SURVNET@RKI7.3-HIV	Cp	Co	P	C	Y	Y	Y	N	Y
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y
Hungary	HU-HIV/AIDS	Cp	Co	P	C	Y	Y	Y	N	Y
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	N	Y
Ireland	IE-HIV/AIDS	V	Co	P	C	Y	Y	Y	N	Y
Italy	IT-COA-ISS	Cp	Se	P	C	Y	N	Y	-	N
Latvia	LV-HIV/AIDS	Cp	Co	P	C	Y	Y	Y	N	Y
Lithuania	LT-AIDS_CENTRE	Cp	Co	P	C	Y	Y	N	N	-
Luxembourg	LU-HIV	V	Co	P	C	Y	Y	N	N	Y
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	N	-
Netherlands	NL-HIV/AIDS	V	Co	P	C	N	Y	Y	N	Y
Norway	NO-MSIS_B	Cp	Co	P	C	Y	Y	Y	N	-
Poland	PL-HIV	Cp	Co	P	C	Y	Y	N	N	-
Portugal	PT-HIV/AIDS	Cp	Co	P	C	Y	Y	N	N	Y
Romania	RO-RSS	Cp	Co	P	C	N	Y	Y	N	-
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y
Slovenia	SI-HIVSUR-HIV	Cp	Co	P	C	N	Y	N	N	Y
Spain	ES-HIV	Cp	Co	P	C	Y	Y	N	N	N
Sweden	SE-SweHIVReg	Cp	Co	P	C	Y	Y	Y	N	Y
United Kingdom	UK-HIV	V	Co	A	C	Y	Y	Y	Y	Y

Syphilis

- In 2011, 19798 syphilis cases were reported from 29 EU/EEA Member States, a rate of 4.9 cases per 100 000 population.
- Syphilis was reported four times more frequently among men than women, a rate of 7.5 and 1.9 cases per 100 000 population, respectively. Almost half (42%) of syphilis cases with information on transmission category were reported among men who have sex with men (MSM).
- One sixth of all syphilis cases in 2011 (16%) were reported in young people between 15 and 24 years of age; the majority of cases were reported among people older than 25 years.
- The overall rate decreased from 8.4 per 100 000 population in 2000 to 4.9 in 2011; however the rate increased slightly in 2011 compared with 2010. The male-to-female rate ratio suggests that this may be due to recent increases of syphilis among MSM.
- In 2011, 87 congenital syphilis cases were reported by 21 EU/EEA Member States, a rate of 3.2 per 100 000 live births. The trend of reported congenital syphilis cases has remained stable over the years, however it is suspected that there is considerable underreporting.

Syphilis is a sexually transmitted infection caused by the spirochete *Treponema pallidum* subspecies *pallidum*. Although syphilis can be easily treated with penicillin, congenital syphilis is a serious condition which can be fatal or cause permanent impairment.

Epidemiological situation in 2011

In 2011, 19798 syphilis cases were reported by 29 EU/EEA Member States, a rate of 4.9 per 100 000 population (Table 2.2.6). Liechtenstein was the only country not to report data. More than two thirds (63%) of all cases were reported by four countries (Germany, United Kingdom, Spain and Romania).

Between 2007 and 2011, the number of reported cases increased in 19 countries and decreased in 10. The overall small decrease (1%) (Table 2.2.6) is mainly due to a substantial decrease of cases in a number of countries that previously reported high rates of syphilis. The largest decreases between 2007 and 2011 were observed in Latvia, Italy and Romania. The highest increases (by more than 100%) were observed in Denmark, Malta, Slovenia, Slovakia, Ireland and Norway.

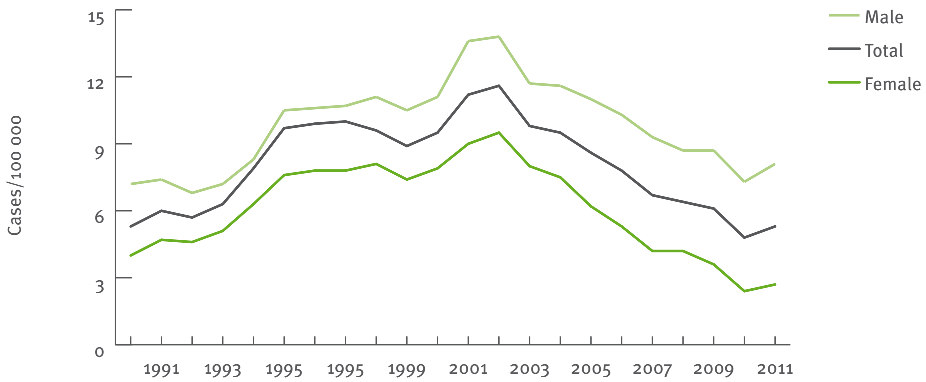
Between 2010 and 2011, the overall rate increased by 9%, and by 13% among men. A number of countries reported large increases in overall rates between 2010 and 2011, particularly Luxembourg (111%), Slovenia (95%), Malta (80%), Romania (31%), Ireland (24%) and Germany (22%).

In 2011, the syphilis notification rates varied widely: from below three per 100 000 population in Iceland, Portugal, Sweden, Greece and Norway, to rates above eight in Romania (11.0), Malta (10.8) and Lithuania (8.4).

Age and gender distribution

Information on gender was available for 16 634 cases of syphilis: 13 234 cases were reported in males and 3 400 in females, with rates of 7.5 and 1.9 per 100 000 population, respectively. The highest rates for men were reported by Malta (16.9 per 100 000 male population) and Denmark (13.8), while the highest rates for women were reported by Romania (10.8 per 100 000 female population) and Slovakia (6.5). Overall, the male-to-female rate ratio was 3.9:1 in 2011, with marked differences between countries. Ratios above 10 were reported by France, Norway, Germany and Ireland. Austria was the only country to report a male-to-female ratio below one, due to the compulsory screening of sex workers.

Figure 2.2.10. Reported number of syphilis cases, EU/EEA, 1990–2011



Male-to-female ratios close to one were reported by Estonia, Lithuania, Slovakia, and Romania.

In 2011, information on age was available from 27 countries. Age was not reported by Spain and Bulgaria, which reported 17% of syphilis cases overall. Of all reported cases in 2011, the age categories 25–34 and 35–44 years were the largest, with 30% and 27% of all cases. Only 12% of cases were diagnosed in the 20–24-year age group.

In 2011, 81% of all cases were 25 years or older (compared with 60% in 2000), whereas only 16% were reported in the 15–24-years age category (39% in 2000). Between 2000 and 2011, age-specific rates decreased considerably among those below 25 years of age, remained stable among 25–34-year-olds, but increased among older persons, particularly 35–44-year-olds. Age-specific rates were highest among 25–34-year-old males in 2011, with a rate of 16.1 per 100 000 population (Figure 2.2.11).

Transmission category

In 2011, information on transmission category was available from 20 countries, representing 49% of all syphilis cases (n=9798). Transmission category was reported as heterosexual (43%), MSM (42%) or unknown (16%). The percentage of cases diagnosed in MSM ranges from below 10% (Latvia, Slovakia, Lithuania, Romania and Estonia) to more than 70% in Ireland, Norway, France, the Netherlands, Denmark, Luxembourg, Sweden and the United Kingdom; the remaining countries report MSM transmission for 30–70% of cases. Cases diagnosed in MSM represent 55% of all male cases diagnosed in 2011 overall.

Congenital syphilis

In 2011, 21 EU/EEA Member States reported data on congenital syphilis: eleven countries reported zero cases; 10 countries reported a total of 87 cases, all of which were confirmed. The majority of the cases were reported from Bulgaria (38 cases), Poland (14), Portugal (10) and Romania (10).

Table 2.2.6. Numbers and rates of syphilis cases reported in the EU/EEA, 2007–2011

Country	2011*					2010*		2009*		2008*		2007*	
	National coverage	Report type	Total cases	Reported cases and rate per 100 000 population		Reported cases and rate per 100 000 population		Reported cases and rate per 100 000 population		Reported cases and rate per 100 000 population		Reported cases and rate per 100 000 population	
				Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria*	N	C	72	72	-	59	-	62	-	61	-	58	-
Belgium*	N	C	540	540	-	502	-	486	-	480	-	403	-
Bulgaria	Y	A	314	314	4.18	397	5.25	420	5.52	419	5.48	440	5.73
Cyprus*	Y	C	16	16	-	20	-	15	-	14	-	10	-
Czech Republic	Y	C	358	358	3.4	462	4.4	697	6.66	342	3.29	205	1.99
Denmark	Y	C	427	427	7.68	413	7.46	255	4.63	151	2.76	92	1.69
Estonia	Y	C	65	65	4.85	69	5.15	57	4.25	71	5.29	78	5.81
Finland	Y	C	176	176	3.27	200	3.74	194	3.64	211	3.98	185	3.51
France*	N	C	747	747	-	653	-	536	-	567	-	597	-
Germany	Y	C	3694	3694	4.52	3029	3.7	2730	3.33	3187	3.88	3277	3.98
Greece	N	A	272	272	2.4	241	2.13	259	2.3	155	1.38	197	1.76
Hungary*	N	A	565	565	-	504	-	489	-	549	-	393	-
Ireland	Y	C	138	138	3.08	112	2.51	106	2.38	119	2.7	62	1.44
Italy*	Y	C	750	750	-	1060	-	1433	-	1412	-	1482	-
Latvia	Y	C	143	143	6.41	122	5.43	175	7.74	236	10.39	305	13.37
Lithuania	Y	C	273	273	8.41	345	10.36	326	9.73	326	9.68	275	8.12
Luxembourg	Y	C	28	28	5.47	13	2.59	13	2.63	12	2.48	14	2.94
Malta	Y	C	45	45	10.78	25	6.03	16	3.87	19	4.63	11	2.7
Netherlands*	N	C	545	545	-	695	-	711	-	792	-	657	-
Poland	Y	A	941	941	2.46	914	2.39	1255	3.29	929	2.44	847	2.22
Portugal	Y	C	159	159	1.49	179	1.68	150	1.41	98	0.92	112	1.06
Romania	Y	C	2364	2364	11.04	1809	8.43	3252	15.13	4006	18.61	4245	19.68
Slovakia	Y	C	383	383	7.05	335	6.18	294	5.43	228	4.22	152	2.82
Slovenia	Y	C	79	79	3.85	40	1.95	47	2.31	63	3.13	31	1.54
Spain	Y	A	3144	3144	6.81	3187	6.93	2496	5.45	2545	5.62	1936	4.35
Sweden	Y	C	203	203	2.16	198	2.12	182	1.97	166	1.81	237	2.6
United Kingdom	Y	A	3225	3225	5.16	2911	4.69	3215	5.22	3309	5.41	3561	5.86
EU total	**-**	**-**	**19666**	**19666**	**4.98**	**18494**	**4.55**	**19871**	**4.91**	**20467**	**5.06**	**19862**	**4.98**
Iceland	Y	C	2	2	0.63	5	1.57	0		2	0.63	1	0.33
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	130	130	2.64	118	2.43	76	1.58	56	1.18	61	1.3
Total	**-**	**-**	**19798**	**19798**	**4.94**	**18617**	**4.52**	**19947**	**4.86**	**20525**	**5**	**19924**	**4.93**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report. * Countries with sentinel systems (rates not calculated). ** Year according to 'date of diagnosis' variable. Case numbers may differ from those reported in national bulletins as different date variables are used.

Although the number of congenital cases reported in 2011 decreased by 10% compared with 2010, the number of cases reported by Bulgaria, Portugal and Romania have remained stable or increased.

The rate of congenital syphilis was 3.2 cases per 100 000 live births in 2011, with the highest rates observed in Bulgaria (53.6 per 100 000) and Portugal (10.3). It should be noted that nine countries did not report congenital syphilis cases in 2011, and it is likely that the reported rates are underestimated.

Discussion

In 2011, the distribution of syphilis varied across countries; rates ranged from less than 1 to 11 per 100 000 population. Although the overall rate has been declining in recent years, in 2011, there was an increase of 9% in the rate of reported cases. The overall declining rate in previous years was largely due to the substantial decrease of reported cases in four countries (Estonia, Latvia, Romania, and Bulgaria), which during the last ten years had reported very high rates of syphilis. These decreases may reflect changes in healthcare systems (i.e. privatisation) or reporting systems rather than an actual decrease. In a number of other countries, however, dramatic increases were reported: the Czech Republic, Denmark, Germany[1], Ireland, Spain[2], Sweden[3] and the United Kingdom[4] all reported a strong upward trend; the male-to-female rate ratio and gender-specific rates suggest that this may be due to increases in cases among men, particularly among MSM.

The proportion of syphilis cases reported in MSM varies across the EU/EEA, with high proportions mainly reported in western and northern countries (France, the Netherlands, Denmark, Norway, Ireland) but also in Slovenia and the Czech Republic, suggesting that syphilis is largely transmitted among MSM in the EU/EEA. However, the interpretation of these findings is hampered by the incompleteness of reporting and insufficient information from other countries. The high male-to-female ratio reported in many countries may indicate a possible underreporting of cases in MSM in countries where data on transmission category are not available. Data in the remaining countries may suggest that homosexually acquired cases may not be identified and reported as such. This issue needs to be reviewed in more detail and in close collaboration with the affected Member States.

Less than a fifth of all syphilis cases were reported in young people between 15 and 24 years of age, in contrast to other STIs. For syphilis, the peak of infections in 2011 was found among 25–34-year-old males, particularly among MSM.

Although reported trends of congenital syphilis remained stable over the years, considerable underreporting is suspected. Effective antenatal screening programmes are crucial in preventing mother-to-child transmission. ECDC is conducting a project aiming to describe the effectiveness of antenatal screening in EU/EEA countries and to identify challenges for the elimination of mother-to-child transmission of syphilis.

In general, the majority of countries which reported syphilis diagnoses indicate that data on STI are obtained from dedicated special services (STI clinics) rather than general practitioners. In addition, data are obtained from sentinel surveillance in a number of countries, suggesting that the actual number of reported cases may be underestimated. Also, many diagnoses are either not made or not reported, which severely limits the interpretation of the epidemiological situation in the EU/EEA. Diagnoses from a number of countries cannot be included in trend analyses as they do not offer comprehensive surveillance for STI. Future efforts will be made to improve data completeness and enhance comparability.

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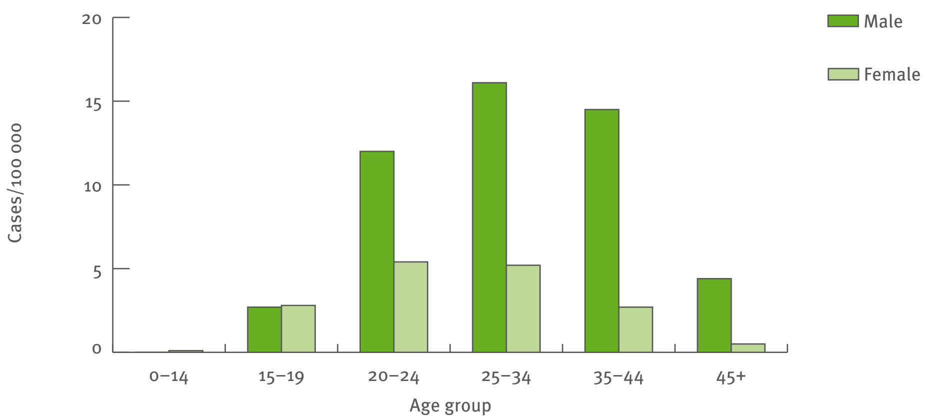
Figure 2.2.11. Rates of confirmed syphilis cases reported in the EU/EEA, by age and gender, 2011



Source: Country reports from Bulgaria, Cyprus, Czech Republic, Germany, Denmark, Finland, Greece, Ireland, Iceland, Italy, Lithuania, Luxembourg, Latvia, Malta, Norway, Portugal, Sweden, Slovenia, Slovakia and the United Kingdom.

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by: Laboratories	Physicians	Hospitals	Others	National coverage	National reference laboratory data	Comparable data available	Case definition used
Austria	AT-STISentinella	V	Se	A	C	Y	N	N	N	N	-	-	EU-2008
Belgium	BE-LABNET	V	Se	A	C	Y	N	-	-	Y	-	-	Not specified/unknown
Bulgaria	BG-STI	Cp	Co	P	A	-	-	Y	Y	-	-	-	EU-2002
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Czech Republic	CZ-STD	Cp	Co	A	C	N	Y	Y	N	Y	-	-	EU-2008
Denmark	DK-STI_CLINICAL	Cp	Co	P	C	N	Y	N	N	Y	-	-	Other
Estonia	EE-PERTUSSIS/SHIGELLOSIS/SYPHILIS	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Finland	FI-NIDR	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
France	FR-STI	V	Se	A	C	Y	Y	Y	Y	N	-	-	Not specified/unknown
Germany	DE-SURVNET@RKI-7.3	Cp	Co	P	C	Y	N	N	N	Y	-	-	Other
Greece	GR-NOTIFIABLE_DISEASES	Cp	O	P	A	Y	Y	Y	Y	N	-	-	EU-2008
Hungary	HU-STD SURVEILLANCE	Cp	Se	P	A	N	Y	N	N	Y	-	-	EU-2008
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Ireland	IE-SYPHILIS	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2002
Italy	IT-NRS	Cp	Co	P	C	N	Y	Y	N	Y	-	-	Other
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Netherlands	NL-STI	V	Se	P	C	N	Y	N	N	Y	-	-	Other
Norway	NO-MSIS_B	Cp	Co	P	C	Y	Y	Y	-	Y	-	-	Not specified/unknown
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	Not specified/unknown
Portugal	PT-SYPHILIS	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Romania	RO-RNSSy	Cp	Co	P	A	N	N	Y	N	Y	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y	-	-	EU-2008
Slovenia	SI-SPOSUR	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Spain	ES-STATUTORY_DISEASES_STI_AGGR	Cp	Co	P	A	N	Y	N	N	Y	-	-	Not specified/unknown
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
United Kingdom	UK-GUM	Cp	Co	P	A	N	N	N	Y	Y	-	-	Other

2.3 Food- and waterborne diseases and zoonoses

Anthrax

- Anthrax is a rare disease in Europe and only a few sporadic cases are reported each year.
- In Europe, the most common form is cutaneous anthrax.
- The risk of infection is greatest among people who inject drugs (PWID) due to their exposure to drugs contaminated with anthrax spores.

Anthrax is an infectious disease caused by the Gram-positive, spore-forming bacterium *Bacillus anthracis*. It is an environmental micro-organism capable of forming spores which are very resistant and can remain inactive in the soil for many years. There are three clinical forms of the disease: cutaneous, digestive and respiratory. Cutaneous is the most common form of anthrax in Europe. It occurs when spores of anthrax penetrate the skin as a result of an abrasion or cut. Lesions on the skin develop usually after two to five days forming dark necrotic sores. The gastrointestinal form occurs after eating meat originating from an infected animal. The gastrointestinal symptoms are similar to food poisoning but can worsen to severe abdominal pain, vomiting of blood, and diarrhoea. Pulmonary anthrax is caused by the inhalation of spores. Initial respiratory symptoms are similar to those of a common cold, but can rapidly progress to severe breathing difficulties leading to fatal shock[1].

Epidemiological situation in 2011

In 2011, 29 EU/EEA countries provided data on anthrax. Overall, six confirmed cases of anthrax were reported; two from Greece, two from Romania, one from Bulgaria and one from France (Table 2.3.1). Since the 2010 outbreaks among intravenous drug users, the occurrence of cases has returned to the background level of a few sporadic cases being reported annually[2,3].

Age and gender distribution

Four cases were males and one was female. For one case no gender information was reported. The cases were evenly distributed across age groups, excluding children: one case was in the age group 15–24 years, two were in the age group 25–44 years, one case was in the age group 45–64 years and one case was over 65 years. The five cases in 2011 were reported between August and October.

Updates from epidemic intelligence in 2012

Between June and December 2012, an outbreak of anthrax occurred in the EU among PWID. Thirteen confirmed cases were reported, including five fatalities. Six of the cases were from the United Kingdom, three of which were fatal, four were from Germany, one of which was fatal, two from Denmark, one of which was fatal, and one case was from France. In 2009–2010, a similar outbreak occurred, resulting in 124 cases in the United Kingdom and three in Germany[4].

Discussion

The very few sporadic cases of anthrax reported through the mandatory notification systems represent the low level of exposure to anthrax spores in Europe. Anthrax still occurs naturally in both animals and humans in many parts of the world, but mainly outside the EU in southern Europe, Asia, sub-Saharan Africa and parts of Australia. In Europe, however, the risk of exposure to contaminated drugs remains moderate for PWID. Several clusters and outbreaks of cutaneous anthrax among intravenous drug users have been reported in recent years, suggesting that the population most at risk of contracting anthrax are injecting drug users in Europe[5].

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Table 2.3.1. Numbers and rates of confirmed anthrax cases reported in the EU/EEA, 2007–2011

Country	2011						2010		2009		2008		2007	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population			Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Rate	Age standardised rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Belgium	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Bulgaria	Y	A	2	1	0.01	-	3	0.04	2	0.03	1	0.01	1	0.01
Cyprus	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Czech Republic	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Denmark	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Estonia	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Finland	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
France	Y	C	1	1	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Germany	Y	C	0	0	0.00	0.00	1	0.00	1	0.00	0	0.00	0	0.00
Greece	Y	C	2	2	0.02	0.02	0	0.00	1	0.01	0	0.00	0	0.00
Hungary	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Ireland	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Italy	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Latvia	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Lithuania	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Luxembourg	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Malta	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Netherlands	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Poland	Y	A	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Portugal	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Romania	Y	C	2	2	0.01	0.01	0	0.00	0	0.00	0	0.00	1	0.01
Slovakia	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Slovenia	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Spain	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	1	0.00
Sweden	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
United Kingdom	Y	C	0	0	0.00	0.00	28	0.05	10	0.02	1	0.00	0	0.00
EU total	**-**	**-**	**7**	**6**	**0.00**	**0.00**	**32**	**0.01**	**14**	**0.00**	**2**	**0.00**	**3**	**0.00**
Iceland	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	**-**	**-**	**7**	**6**	**0.00**	**0.00**	**32**	**0.01**	**14**	**0.00**	**2**	**0.00**	**3**	**0.00**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by: Laboratories	Physicians	Hospitals	Others	National coverage	National reference laboratory data	Comparable data available	Case definition used
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	-	-	-	EU-2008
Belgium	BE-REFLAB	V	Co	P	C	Y	N	N	N	-	-	-	Not specified/unknown
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	-	-	-	EU-2008
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	-	-	-	EU-2008
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	-	-	-	EU-2008
Denmark	DK-MIS	Cp	Co	P	C	N	Y	N	N	-	-	-	Other
Estonia	EE-ANTH/CHOL/DIPH/MALA/SPOX/ TRIC/TULA/TYPH	Cp	Co	P	C	Y	Y	Y	Y	-	-	-	EU-2008
Finland	FI-NIDR	Cp	Co	P	C	Y	Y	N	N	-	-	-	Not specified/unknown
France	FR-MANDATORY_INFECTIOUS_DISEASES	Cp	Co	P	C	Y	Y	Y	Y	-	-	-	Not specified/unknown
Germany	DE-SURVNET@RKI-7.1	Cp	Co	P	C	Y	N	N	Y	-	-	-	Other
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	-	-	-	EU-2008
Hungary	HU-EFRIR	Cp	Co	P	C	Y	Y	Y	N	-	-	-	EU-2008
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	N	-	-	-	EU-2008
Ireland	IE-CIDR	Cp	Co	P	C	Y	Y	Y	N	-	-	-	EU-2008
Italy	IT-NRS	Cp	Co	P	C	N	Y	Y	N	-	-	-	Other
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	-	-	-	EU case definition (legacy/deprecated)
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	-	-	-	Not specified/unknown
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	Y	Y	N	N	-	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	-	-	-	EU-2008
Netherlands	NL-OSIRIS	Cp	Co	P	C	Y	Y	N	N	-	-	-	EU-2008
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	-	-	-	Not specified/unknown
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	N	-	-	-	EU-2008
Portugal	PT-ANTRAX	Cp	Co	P	C	N	Y	N	N	-	-	-	Other
Romania	RO-RNSSy	Cp	Co	P	C	N	N	Y	N	-	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	-	-	-	EU-2008
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	-	-	-	EU-2008
Spain	ES-STATUTORY_DISEASES	Cp	Co	P	C	N	Y	Y	N	-	-	-	EU-2008
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	-	-	-	EU-2008
United Kingdom	UK-ANTHRAX	Cp	Co	A	C	Y	N	Y	Y	-	-	-	Other

Botulism

- Botulism is a rare disease in the EU.
- A total of 112 confirmed cases were reported in 2011, resulting in a rate of 0.02 per 100 000 population.
- The EU trend remained stable during the period 2007–2011.
- The most affected population group were females aged 0–4 years, with a notification rate of 0.07 cases per 100 000 population in 2011.

Botulism is a serious paralytic illness caused by a nerve toxin produced by the spore-forming bacterium *Clostridium botulinum*. The disease may occur after eating foods containing the toxin or, in the case of children under one year, as a result of spore colonisation and subsequent growth of the bacteria within the intestine (infant botulism). It can also occur in the form of bacterial growth within wounds, however this type of botulism is mainly diagnosed in injecting drug users.

Epidemiological situation in 2011

In 2011, 141 cases of botulism were reported by 27 EU Member States, Norway and Iceland (Table 2.3.2). Of these, 112 were confirmed, representing an increase of 8% on 2010, when 104 confirmed cases were reported. Italy, Poland, Romania and France accounted for 75% of all confirmed cases.

The overall trend in the number of reported cases has remained stable between 2007 and 2011, with an average of fewer than 10 cases reported per month (Figure 2.3.1). During the five-year period 2007–2011, the case rate varied between 0.02 and 0.03 per 100 000 population (Table 1).

Age and gender distribution

Data on gender and age were available for 110 cases. As in 2010, the highest number of cases (n=32) was reported for the age group 25–44 years. In 2011, the overall male-to-female ratio was 1:1 but the case rate varied remarkably across the age groups (Figure 2.3.2). The highest notification rate was among females in the age group 0–4 years (0.07 cases per 100 000).

All cases with known data on travel-status (n=84) were reported as autochthonous (i.e. having contracted the disease in their own country).

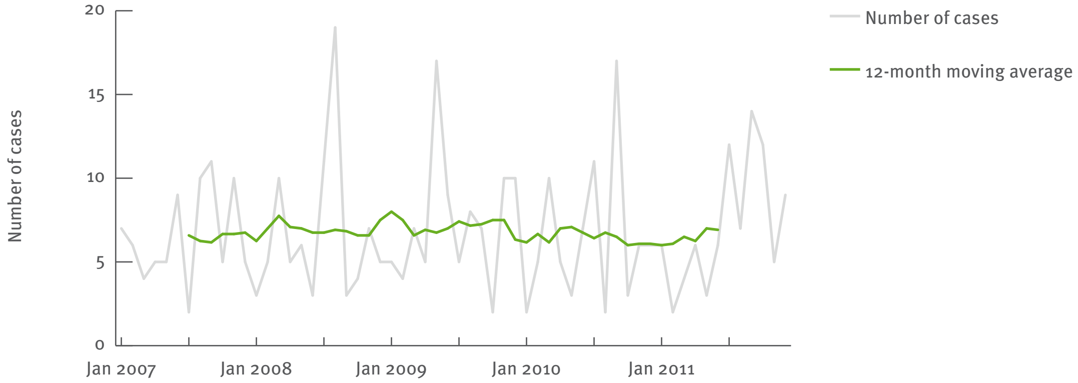
Seasonality

In 2011, the highest number of confirmed cases was reported in September, with a lower peak in July (Figure 2.3.3). The cases appear to have increased during the summer/early autumn months, although the peak month varies from year to year (Figure 2.3.3).

Updates from epidemic intelligence in 2012

In contrast to 2011, when ECDC monitored three events or public health threats related to botulism, there were no threats of botulism identified during routine epidemic intelligence activities in 2012. In September 2011, two separate family outbreaks of botulism – without an epidemiological link – occurred in Barcelona, Spain[1]. This was the first report of botulism in Spain for 25 years. In both events the possible source of infection was a homemade food; the first outbreak affected five family members who shared a meal and involved a rarely reported *Clostridium baratii* producing neurotoxin F. The second family outbreak came a few days after the first and was caused by *C. botulinum* toxin A, probably present in homemade pâté[1]. A family cluster of two botulism cases due to *C. botulinum* toxin B was reported in Austria in 2011 but the source food was not identified[2].

Figure 2.3.1. Trend and number of confirmed cases of botulism reported in the EU/EEA, 2007–2011



Source: Country reports: Austria, Belgium, Cyprus, Denmark, Estonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden.

Discussion

As in previous years, the epidemiology of botulism in the EU seems to be stable, with a few sporadic cases and small family clusters reported, resulting in notification rates that fluctuate between 0.02 and 0.03 cases per 100 000 population.

Together with *C. botulinum* and *C. butyricum*, *Clostridium baratii* is a rare but well-known cause of botulism due to the production of neurotoxin F. Therefore, if botulism is suspected it is advisable to test for all botulism neurotoxins at the earliest possible stage.

The number of cases reported in 2011 that were related to the use of injected drugs is not known at the EU level. Nevertheless, during the period 2000–2009 a total of 160 clinically or microbiologically confirmed cases of botulism among injecting drug users were identified in a study that covered the European Union, Croatia and Norway[3].

References

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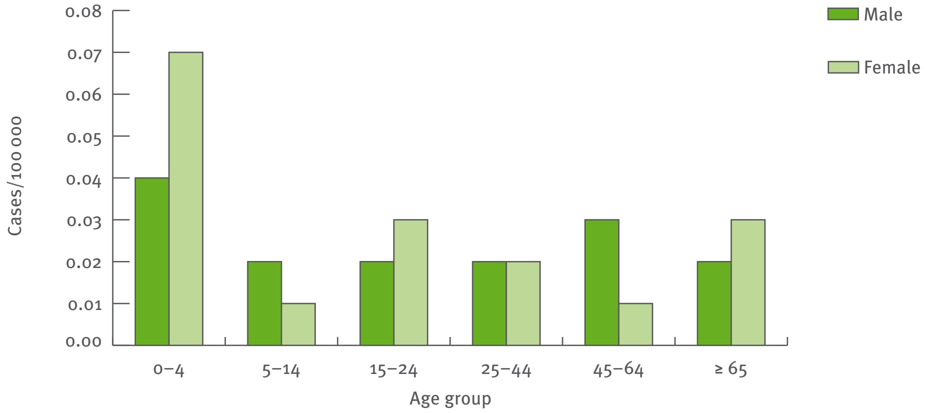
2. Vessel MG, Gattringer KB, Wenish J, Khalifeh N, Koreny M, Spertini V, et al. The first cases(s) of botulism in Vienna in 21 Years: a case report. Case Rep Infect Dis. 2012;2012:438989.
3 Hope VD, Palmateer N, Wiessing L, Marongiu A, White J, Ncube F, et al. A decade of spore-forming bacterial infections among European injecting drug users: pronounced regional variation. Am J Public Health. 2012 Jan;102(1):122-5.

Table 2.3.2. Numbers and rates of confirmed botulism cases reported in the EU/EEA, 2007–2011

Country	2011					2010		2009		2008		2007	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	Y	C	7	5	0.06	0	0.00	0	0.00	0	0.00	0	0.00
Belgium	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Bulgaria	Y	A	3	2	0.03	1	0.01	1	0.01	0	0.00	0	0.00
Cyprus	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Czech Republic	Y	C	0	0	0.00	0	0.00	1	0.01	1	0.01	-	-
Denmark	Y	C	2	2	0.04	1	0.02	0	0.00	1	0.02	0	0.00
Estonia	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Finland	Y	C	2	2	0.04	0	0.00	0	0.00	0	0.00	0	0.00
France	Y	C	17	11	0.02	14	0.02	23	0.04	8	0.01	10	0.02
Germany	Y	C	9	7	0.01	3	0.00	5	0.01	10	0.01	9	0.01
Greece	Y	C	0	0	0.00	0	0.00	1	0.01	0	0.00	1	0.01
Hungary	Y	C	5	5	0.05	3	0.03	3	0.03	1	0.01	5	0.05
Ireland	Y	C	1	1	0.02	0	0.00	0	0.00	5	0.11	0	0.00
Italy	Y	C	24	24	0.04	26	0.04	32	0.05	23	0.04	16	0.03
Latvia	Y	C	0	0	0.00	0	0.00	0	0.00	1	0.04	0	0.00
Lithuania	Y	C	3	3	0.09	2	0.06	0	0.00	2	0.06	4	0.12
Luxembourg	Y	C	0	0	0.00	0	0.00	0	0.00	1	0.21	0	0.00
Malta	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Netherlands	Y	C	0	0	0.00	0	0.00	0	0.00	1	0.01	1	0.01
Poland	Y	C	35	21	0.06	22	0.06	15	0.04	22	0.06	24	0.06
Portugal	Y	C	1	1	0.01	0	0.00	3	0.03	4	0.04	10	0.09
Romania	Y	C	19	18	0.08	21	0.10	29	0.14	26	0.12	31	0.14
Slovakia	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Slovenia	Y	C	0	0	0.00	2	0.10	0	0.00	0	0.00	0	0.00
Spain	Y	C	10	7	0.02	4	0.01	6	0.01	5	0.01	4	0.01
Sweden	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
United Kingdom	Y	C	3	3	0.01	3	0.01	13	0.02	1	0.00	14	0.02
EU total	**-**	**-**	**141**	**112**	**0.02**	**102**	**0.02**	**132**	**0.03**	**112**	**0.02**	**129**	**0.03**
Iceland	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	0	0	0.00	1	0.02	0	0.00	0	0.00	0	0.00
Total	**-**	**-**	**141**	**112**	**0.02**	**103**	**0.02**	**132**	**0.03**	**112**	**0.02**	**129**	**0.03**

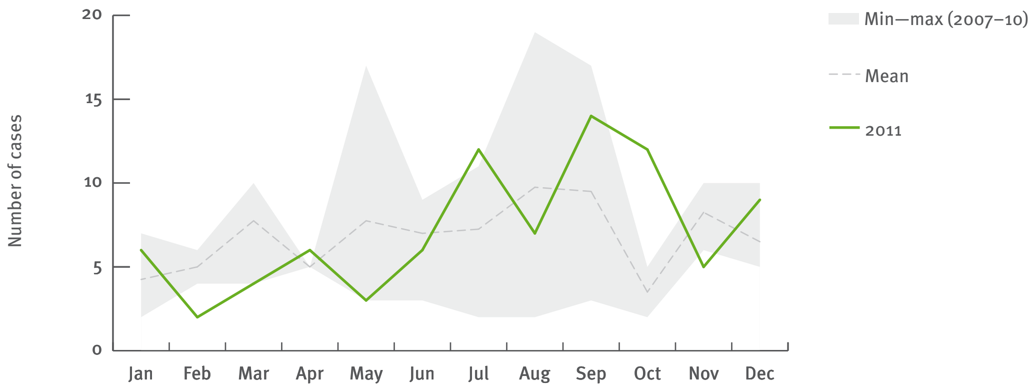
Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

Figure 2.3.2. Rates of confirmed botulism cases reported in the EU/EEA, by age and gender, 2011



Source: Country reports from Austria, Finland, France, Germany, Hungary, Ireland, Italy, Lithuania, Poland, Portugal, Romania, Spain and the United Kingdom.

Figure 2.3.3. Seasonal distribution: Number of confirmed cases of botulism by month, EU/EEA, 2007–2011



Source: Country reports from Austria, Belgium, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain and Sweden.

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by				National coverage	National reference laboratory data	Comparable data available	Case definition used
						Laboratories	Physicians	Hospitals	Others				
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	-	-	-	EU-2008
Belgium	BE-REFLAB	V	Co	P	C	Y	N	N	Y	-	-	-	Not specified/unknown
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	-	-	-	EU-2008
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	Y	-	-	-	EU-2008
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	Y	-	-	-	EU-2008
Denmark	DK-MIS	Cp	Co	P	C	N	Y	N	Y	-	-	-	Other
Estonia	EE-BOTULISM	Cp	Co	P	C	Y	Y	Y	Y	-	-	-	EU-2008
Finland	FI-NIDR	Cp	Co	P	C	Y	Y	N	Y	-	-	-	Not specified/unknown
France	FR-MANDATORY_INFECTIOUS_DISEASES	Cp	Co	P	C	Y	Y	Y	Y	-	-	-	Not specified/unknown
Germany	DE-SURVNET@RKI-7.1/6	Cp	Co	P	C	Y	Y	Y	Y	-	-	-	Other
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	Y	-	-	-	EU-2008
Hungary	HU-EFRIR	Cp	Co	P	C	Y	Y	Y	Y	-	-	-	EU-2008
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	Y	-	-	-	EU-2008
Ireland	IE-CIDR	Cp	Co	P	C	Y	Y	Y	Y	-	-	-	EU-2008
Italy	IT-NRS	Cp	Co	P	C	N	Y	Y	Y	-	-	-	Other
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	Y	-	-	-	EU case definition (legacy/deprecated)
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	Y	-	-	-	Not specified/unknown
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	Y	Y	N	Y	-	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	-	-	-	EU-2008
Netherlands	NL-OSIRIS	Cp	Co	P	C	Y	Y	N	Y	-	-	-	EU-2008
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	Y	-	-	-	Not specified/unknown
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	-	-	-	EU-2008
Portugal	PT-BOTULISM	Cp	Co	P	C	N	Y	N	Y	-	-	-	Other
Romania	RO-RNSSy	Cp	Co	P	C	N	N	Y	Y	-	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	Y	-	-	-	EU-2008
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	Y	-	-	-	EU-2008
Spain	ES-STATUTORY_DISEASES	Cp	Co	P	C	N	Y	Y	Y	-	-	-	EU-2008
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	Y	-	-	-	EU-2008
United Kingdom	UK-BOTULISM	Cp	Co	P	C	Y	N	Y	Y	-	-	-	Other

Brucellosis

- In 2011, 332 confirmed cases of brucellosis were reported, with an overall rate of 0.07 cases per 100 000, representing a slight decrease (7%) compared to the 358 cases reported in 2010.
- Human cases of brucellosis have followed a significant, decreasing trend in EU/EEA countries since 2007.
- The majority (82%) of all confirmed cases were in adults aged over 25 years.

Brucellosis is a systemic infection caused by bacteria of the genus *Brucella*. Human infection is primarily an occupational risk for those working with infected animals or handling their tissues (e.g. farm workers, veterinarians, abattoir or laboratory workers). Food-borne exposure is possible through ingestion of contaminated milk or dairy products but is not common due to the pasteurisation process which kills the bacteria in milk.

Epidemiological situation in 2011

In 2011, 332 confirmed cases of brucellosis were reported by 28 EU/EEA countries (all except Denmark and Liechtenstein). The overall rate was 0.07 cases per 100 000, similar to the rate level in 2010, when 358 confirmed cases were reported (Table 2.3.3). As in previous years, Greece, Spain and Portugal reported a higher number of cases, accounting for 68% of all the confirmed cases reported. Reported human cases of brucellosis have been decreasing significantly in EU/EEA countries since 2007 (Figure 2.3.4).

Age and gender distribution

The data on gender and age were available for almost all confirmed cases (330/332). The male-to-female ratio was 1.64:1 in 2010. Confirmed case rates were higher for males than for females in all age groups, except in the age group of four years and younger where only three females were reported, one each from Germany, Italy and Sweden.

The majority (82%) of the cases were adults over 25 years. The highest case rates were reported for the age groups 25–44 years and those over 65 years (0.08 cases per 100 000 population in both age groups). The highest confirmed case rate was reported for males in Greece (2.31 cases per 100 000 population). Of the 286 cases for which travel information was available, 60 cases (21%) reported travel-related infection.

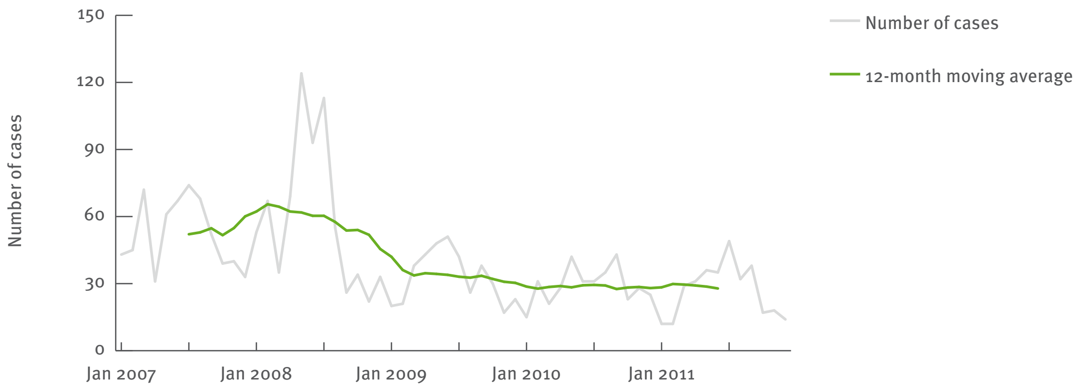
Seasonality

In 2011, two peaks were reported; one in July (50 confirmed cases) and another in September (38 confirmed cases) (Figure 2.3.6).

Discussion

Although the decreasing trend in reported cases of human brucellosis in Europe is encouraging, the disease still occurs in animal herds, particularly in some southern European countries, thus posing a risk for human infection in this region. The reduction in human cases is mostly due to a concomitant decrease of brucellosis circulation in cattle and small ruminant (goats and sheep) populations, which has been recorded since 2005 and is related to EU-wide programmes for the eradication, control and monitoring of animal diseases and zoonoses[1]. Multiple-locus variable number tandem repeat analysis (MLVA) has been successfully used by researchers to study the evolution and epidemiological linkage of human and animal strains[2]. The analyses have suggested ongoing colonisation of Portugal with the majority of human infections caused by a *B. melitensis* lineage, which is mostly associated with the eastern Mediterranean countries[2].

Figure 2.3.4. Trend and number of confirmed cases of brucellosis reported in the EU/EEA, 2007–2011

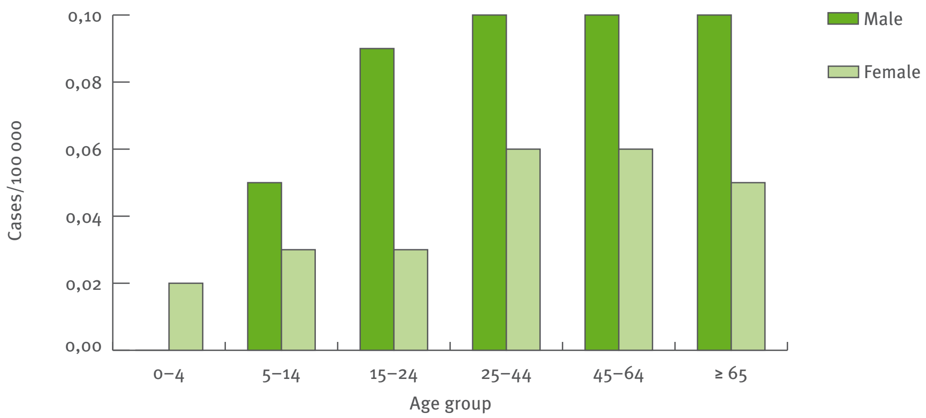


Source: Country reports from Austria, Cyprus, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Malta, the Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

References

1. European Food Safety Authority, European Centre for Disease Prevention and Control. The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2010. EFSA Journal 2012;10(3):2597.
2. Ferreira AC, Chambel L, Tenreiro T, Cardoso R, Flor L, et al. MLVA16 typing of Portuguese human and animal *Brucella melitensis* and *Brucella abortus* isolates. PLoS ONE 2012 7(8): e42514.

Figure 2.3.5. Rates of confirmed brucellosis cases reported in the EU/EEA, by age and gender, 2011



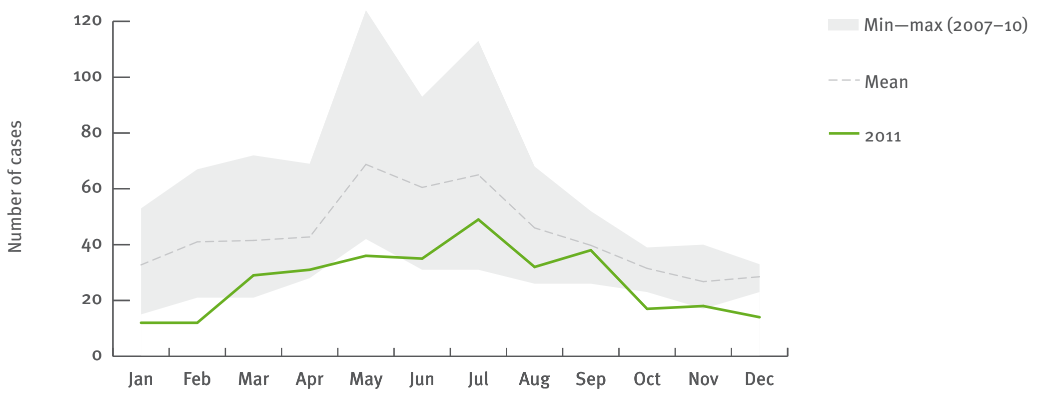
Source: Country reports from Austria, Belgium, Bulgaria, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Romania, Slovenia, Spain, Sweden and the United Kingdom.

Table 2.3.3. Numbers and rates of confirmed brucellosis cases reported in the EU/EEA, 2007–2011

Country	2010						2009		2008		2007		2006	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population			Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Rate	Age standardised rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	Y	C	5	5	0.06	0.06	3	0.04	2	0.02	5	0.06	0	0.00
Belgium	Y	A	5	5	0.05	0.03	0	0.00	1	0.01	1	0.01	3	0.03
Bulgaria	Y	A	2	2	0.03	0.03	2	0.03	3	0.04	8	0.11	9	0.12
Cyprus	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Czech Republic	Y	C	0	0	0.00	0.00	1	0.01	0	0.00	1	0.01	0	0.00
Denmark	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Estonia	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Finland	Y	C	0	0	0.00	0.00	0	0.00	1	0.02	0	0.00	2	0.04
France	Y	C	21	21	0.03	0.03	20	0.03	19	0.03	21	0.03	14	0.02
Germany	Y	C	24	24	0.03	0.03	22	0.03	19	0.02	24	0.03	21	0.03
Greece	Y	C	100	92	0.81	0.83	97	0.86	106	0.94	304	2.71	101	0.90
Hungary	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	1	0.01
Ireland	Y	C	1	1	0.02	0.02	1	0.02	0	0.00	2	0.05	7	0.16
Italy	Y	C	21	21	0.04	0.03	10	0.02	23	0.04	163	0.27	179	0.30
Latvia	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Lithuania	Y	C	0	0	0.00	0.00	0	0.00	1	0.03	0	0.00	0	0.00
Luxembourg	Y	C	1	1	0.20	0.19	1	0.20	0	0.00	0	0.00	0	0.00
Malta	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Netherlands	Y	C	1	1	0.01	0.01	6	0.04	3	0.02	3	0.02	2	0.01
Poland	Y	A	0	0	0.00	0.00	0	0.00	3	0.01	1	0.00	1	0.00
Portugal	Y	C	79	76	0.71	0.70	88	0.83	80	0.75	56	0.53	74	0.70
Romania	Y	C	1	1	0.01	0.01	2	0.01	3	0.01	2	0.01	2	0.01
Slovakia	Y	C	0	0	0.00	0.00	1	0.02	0	0.00	1	0.02	0	0.00
Slovenia	Y	C	1	1	0.05	0.04	0	0.00	2	0.10	2	0.10	1	0.05
Spain	Y	C	54	43	0.09	0.09	78	0.17	114	0.25	120	0.27	201	0.45
Sweden	Y	C	11	11	0.12	0.12	12	0.13	7	0.08	8	0.09	8	0.09
United Kingdom	Y	C	25	25	0.04	0.04	12	0.02	17	0.03	13	0.02	13	0.02
EU total	**-**	**-**	**352**	**330**	**0.07**	**0.07**	**356**	**0.07**	**404**	**0.08**	**735**	**0.15**	**639**	**0.13**
Iceland	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Liechtenstein	-	-	-	-	-	-	-	-	-	-	0	0.00	0	0.00
Norway	Y	C	2	2	0.04	0.04	2	0.04	0	0.00	0	0.00	0	0.00
Total	**-**	**-**	**354**	**332**	**0.07**	**0.07**	**358**	**0.07**	**404**	**0.08**	**735**	**0.15**	**639**	**0.13**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

Figure 2.3.6. Seasonal distribution: Number of confirmed cases of brucellosis by month, EU/EEA, 2007–2011



Source: Country reports: Austria, Cyprus, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by				National coverage	National reference laboratory data	Comparable data available	Case definition used
						Laboratories	Physicians	Hospitals	Others				
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Belgium	BE-REFLAB	V	Co	P	C	Y	N	N	N	Y	-	-	Not specified/unknown
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	Y	-	-	EU-2008
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y	-	-	EU-2008
Denmark	DK-MIS	Cp	Co	P	C	N	Y	N	N	Y	-	-	Other
Estonia	EE-BOTULISM	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Finland	FI-NIDR	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
France	FR-MANDATORY_INFECTIOUS_DISEASES	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	Not specified/unknown
Germany	DE-SURVNET@RKI-7.1/6	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	Other
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Hungary	HU-EFRIR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Ireland	IE-CIDR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Italy	IT-NRS	Cp	Co	P	C	N	Y	Y	N	Y	-	-	Other
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU case definition (legacy/deprecated)
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Netherlands	NL-OSIRIS	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	Not specified/unknown
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Portugal	PT-BOTULISM	Cp	Co	P	C	N	Y	N	N	Y	-	-	Other
Romania	RO-RNSSy	Cp	Co	P	C	N	N	Y	N	Y	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	Y	Y	-	-	EU-2008
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Spain	ES-STATUTORY_DISEASES	Cp	Co	P	C	N	Y	Y	N	Y	-	-	EU-2008
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
United Kingdom	UK-BOTULISM	Cp	Co	P	C	Y	N	Y	Y	Y	-	-	Other

Campylobacteriosis

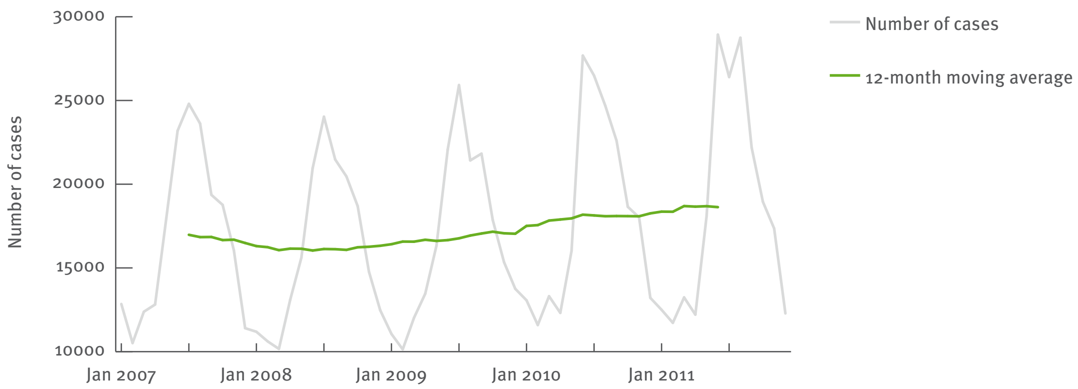
- Human campylobacteriosis increased steadily during a five-year period between 2007 and 2011.
- In 2011, the crude notification rate of campylobacteriosis was 69.54 cases per 100 000 population in the EU/EEA.
- Human campylobacteriosis was more common in children under 5 years, with the notification rate highest for males: 157.53 cases per 100 000 population in 2011.
- Campylobacteriosis shows evidence of regular seasonal patterns, with the highest reported rates during the period June–August.

Campylobacteriosis is an enteric disease caused mainly by thermophilic *Campylobacter* spp. The most common species associated with human campylobacteriosis are *C. jejuni*, *C. coli*, and *C. lari*. The incubation period ranges from two to five days. Common clinical symptoms include watery, sometimes bloody diarrhoea, abdominal pain, fever, headache and nausea. In some cases, *Campylobacter* infection may trigger severe illnesses such as reactive arthritis and the Guillain-Barré syndrome, which manifests as acute, progressing paralysis. Thermophilic *Campylobacter* spp. are prevalent in food-producing animals, pets, wild birds and in environmental water sources. The main route of transmission is by ingestion of contaminated food (mainly chicken) or water. Person-to-person transmission, although possible, is rare.

Epidemiological situation in 2011

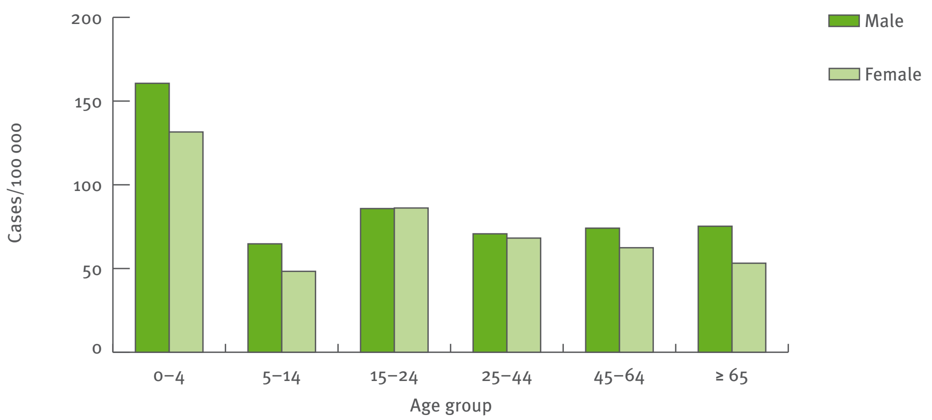
In 2011, 218 380 confirmed cases of campylobacteriosis were reported by 27 EU/EEA countries. The overall crude rate was 69.54 cases per 100 000 in EU/EEA, an increase of 5.58 cases per 100 000 compared with 2010

Figure 2.3.7. Trend and number of confirmed cases of campylobacteriosis reported in the EU/EEA, 2007–2011



Source: Country reports from Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Malta, the Netherlands, Norway, Poland, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Figure 2.3.8. Rates of confirmed campylobacteriosis cases reported in the EU/EEA, by age and gender, 2011



Source: Country reports from Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Romania, Slovakia, Slovenia, Spain , Sweden and the United Kingdom.

(Table 2.3.4). However, as in previous years, it should be noted that confirmed cases reported by France, the Netherlands and Spain were not included in the calculation of country-specific rates as their national systems do not cover the whole population. The countries with highest notification rates were the Czech Republic (177.95 per 100 000 population) followed by Luxembourg (137.54 cases per 100 000 population) (Table 2.3.4).

At the EU level, the case rate of human campylobacteriosis showed a statistically significant increase between 2007 and 2011 (Figure 2.3.7). This significantly increasing trend was reported by 13 EU countries (Belgium, Cyprus, Denmark, Estonia, France, Germany, Hungary, Ireland, Italy, Lithuania, Luxembourg, Malta, and the Netherlands), while a significantly decreasing trend was observed only in Austria[1].

Age and gender distribution

Information on gender and age was provided for 222 780 confirmed cases in EU/EEA countries. Similar to previous years, the male-to-female ratio was 1.17:1 in 2011. The rate for infection in children under five years was 1.7–2.6 times higher than the disease rates in other age groups (Figure 2.3.8). The highest notification rate was in 0–4 year old male children (157.53 per 100 000), representing a slight increase by 1.99 cases per 100 000 on the same age group in 2010 (155.54 per 100 000).

Seasonality

In the EU, human cases of campylobacteriosis displayed a consistent marked seasonality during the period 2007–2011, with most cases reported during June–August (Figure 2.3.9).

Table 2.3.4. Numbers and rates of confirmed campylobacteriosis cases reported in the EU/EEA, 2007–2011

Country	2011						2010		2009		2008		2007	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population			Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Rate	Age-standardised rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	Y	C	5130	1345	16.00	16.37	4404	52.58	1516	18.14	4280	51.45	5822	70.29
Belgium	N	C	7716	7716	-	-	6047	-	5697	-	5111	-	5895	-
Bulgaria	Y	A	73	73	0.97	1.03	6	0.08	26	0.34	19	0.25	38	0.50
Cyprus	Y	C	62	62	7.38	7.10	55	6.71	37	4.64	23	2.91	17	2.18
Czech Republic	Y	C	18811	18743	177.95	181.30	21075	200.58	20259	193.54	20067	193.30	24137	234.63
Denmark	Y	C	4060	4060	73.01	73.83	4037	72.94	3353	60.84	3470	63.37	3868	71.01
Estonia	Y	C	214	214	15.97	15.62	197	14.70	170	12.68	154	11.49	114	8.49
Finland	Y	C	4262	4262	79.29	81.99	3944	73.70	4050	76.04	4453	84.01	4107	77.83
France	N	C	5538	5538	-	-	4324	-	3956	-	3424	-	3058	-
Germany	Y	C	70756	70263	85.95	88.10	65110	79.59	62787	76.57	64731	78.73	66107	80.31
Greece	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hungary	Y	C	6135	6121	61.30	64.11	7180	71.70	6579	65.59	5516	54.91	5809	57.71
Ireland	Y	C	2435	2433	54.30	50.70	1660	37.15	1810	40.67	1752	39.81	1885	43.71
Italy	N	C	468	468	-	-	457	-	531	-	265	-	676	-
Latvia	Y	C	7	7	0.31	0.31	1	0.04	0	0.00	0	0.00	0	0.00
Lithuania	Y	C	1124	1124	34.64	35.29	1095	32.89	812	24.24	762	22.64	564	16.66
Luxembourg	Y	C	704	704	137.54	135.87	600	119.51	523	105.98	439	90.74	345	72.45
Malta	Y	C	220	220	52.68	54.60	204	49.23	132	31.91	77	18.77	91	22.31
Netherlands	N	C	4400	0	-	-	3983	-	3739	-	3328	-	3289	-
Poland	Y	C	354	354	0.93	0.93	367	0.96	359	0.94	270	0.71	192	0.50
Portugal	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Romania	Y	C	149	149	0.70	0.72	175	0.82	254	1.18	0	0.00	0	0.00
Slovakia	Y	C	4736	4565	83.99	83.56	4476	82.51	3813	70.45	3064	56.73	3380	62.67
Slovenia	Y	C	998	998	48.68	50.70	1022	49.93	952	46.84	898	44.67	1127	56.06
Spain	N	C	5469	5469	-	-	6340	-	5106	-	5160	-	5331	-
Sweden	Y	C	8214	8214	87.24	88.23	8001	85.66	7178	77.55	7692	83.76	7106	77.97
United Kingdom	Y	C	72150	72150	115.44	115.16	70298	113.34	65043	105.60	55609	90.88	57849	95.18
EU total	-	-	**224185**	**215252**	**69.73**	**69.63**	**215058**	**69.07**	**198682**	**64.09**	**190564**	**61.91**	**200807**	**65.36**
Iceland	Y	C	123	123	38.62	38.04	55	17.32	74	23.17	98	31.07	93	30.23
Liechtenstein	-	-	-	-	-	-	-	-	-	-	2	5.66	0	0.00
Norway	Y	C	3005	3005	61.07	61.41	2682	55.21	2848	59.34	2875	60.69	2836	60.58
Total	-	-	**227313**	**218380**	**69.54**	**69.43**	**217795**	**68.78**	**201604**	**63.96**	**193539**	**61.85**	**203736**	**65.23**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

Discussion

Human campylobacteriosis has remained the most commonly reported gastrointestinal disease in Europe since 2005[1]. The handling, preparation and consumption of broiler meat has been estimated to account for 20–30% of human campylobacteriosis cases[2]. In 2011, 596 food-borne outbreaks associated with *Campylobacter* were reported by 16 Member States, representing an increase of 26.8% on 2010[1]. Over 2200 persons were affected in these outbreaks, 191 of whom were hospitalised[1]. However, the number of cases in the outbreaks represents only about 1% of all campylobacteriosis cases reported in the EU/EEA in 2011. In 37 confirmed food-borne outbreaks reported in 2011 broiler meat was the most commonly implicated vehicle (46%) and milk (14%) the second most common[1]. Roast chicken and salad were suspected sources in a school outbreak with 75 *C. jejuni* cases in Spain[3]. *Campylobacter* also has the potential to cause large waterborne outbreaks. Two confirmed waterborne outbreaks caused by *Campylobacter* were reported in Member States in 2011[1].

References

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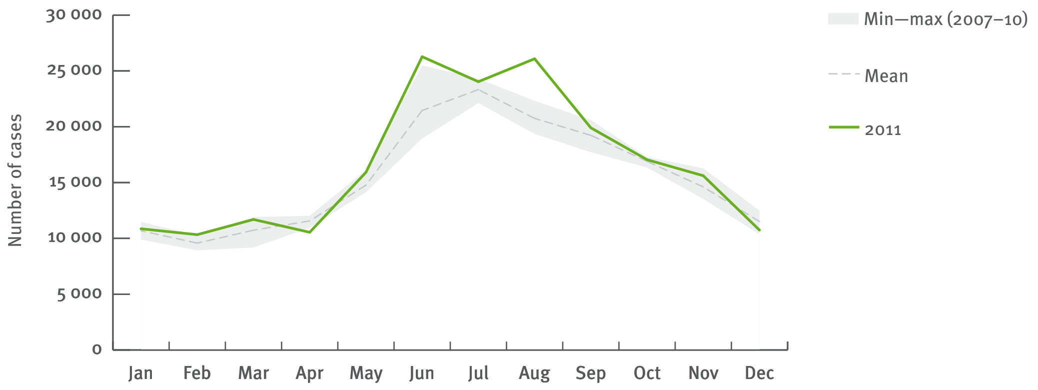
Figure 2.3.9. Seasonal distribution: Number of confirmed cases of campylobacteriosis by month, EU/EEA, 2007–2011



Source: Country reports: Austria, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, Germany, Hungary, Iceland, Ireland, Latvia, Lithuania, Malta, Norway, Poland, Slovakia, Slovenia, Sweden and the United Kingdom.

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by				National coverage
						Laboratories	Physicians	Hospitals	Others	
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	Y
Belgium	BE-LABNET	V	Se	A	C	Y	N	-	-	Y
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	Y
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y
Denmark	DK-LAB	Cp	Co	P	C	Y	N	N	N	Y
Estonia	EE-CAMPYLO	Cp	Co	P	C	Y	Y	Y	Y	Y
Finland	FI-NIDR	Cp	Co	P	C	Y	N	N	N	Y
France	FR-NATIONAL_REFERENCE_CENTRES	V	Co	P	C	Y	N	N	N	N
Germany	DE-SURVNET@RKI-7.1	Cp	Co	P	C	Y	N	N	Y	Y
Hungary	HU-Zoonoses	Cp	Co	P	C	Y	Y	Y	N	Y
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	N	Y
Ireland	IE-CIDR	Cp	Co	P	C	Y	Y	Y	N	Y
Italy	IT-ENTERNET	V	Se	P	C	Y	N	N	N	-
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y
Luxembourg	LU-LNS-Microbio	V	Co	P	C	Y	N	Y	N	Y
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y
Netherlands	NL-LSI	V	Se	P	C	Y	N	N	N	N
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	Y
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	N	Y	Y	N	Y
Romania	RO-RNSSy	Cp	Co	P	C	Y	N	Y	N	Y
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	Y	Y
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y
Spain	ES-MICROBIOLOGICAL	V	Se	P	C	Y	N	N	N	N
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y
United Kingdom	UK-CAMPYLOBACTERIOSIS	O	Co	P	C	Y	N	Y	Y	Y

Cholera

- In 2011, the number of cholera cases increased compared with 2010.
- All cholera cases that occurred in Europe between 2006 and 2011 were imported. Most cholera cases were reported in the age group 0–4 years.
- The majority of cases were reported in June and October.
- United Kingdom reported almost 75% of all cases.

Cholera is a highly infectious, acute enteric illness caused by *Vibrio cholerae* serogroups O1 or O139. The incubation period ranges from a few hours to five days. The clinical course is characterised by the onset of watery diarrhoea, nausea, vomiting, dehydration and acidosis, followed by renal failure and death. The main route of transmission is the ingestion of water or food contaminated with faeces. Cholera is endemic in many countries throughout Africa and Asia and cases detected in Europe are almost entirely related to travel to endemic countries.

Epidemiological situation in 2011

In 2011, 36 (35 confirmed) cases of cholera were reported by seven countries (Table 2.3.5). The United Kingdom reported 26 cases (72.2%), Germany reported

Table 2.3.5. Numbers and rates of confirmed cholera cases reported in the EU/EEA, 2007–2011

Country	2011						2010		2009		2008		2007	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population			Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Rate	Age-standardised rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	1	0.01	0	0.00
Belgium	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Bulgaria	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Cyprus	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Czech Republic	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Denmark	Y	C	1	1	0.02	0.02	0	0.00	0	0.00	1	0.02	0	0.00
Estonia	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Finland	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
France	Y	C	1	1	0.00	0.00	1	0.00	1	0.00	2	0.00	4	0.01
Germany	Y	C	4	3	0.00	0.00	6	0.01	0	0.00	0	0.00	2	0.00
Greece	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Hungary	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Ireland	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Italy	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Latvia	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Lithuania	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Luxembourg	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Malta	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Netherlands	Y	C	2	2	0.01	0.01	0	0.00	0	0.00	5	0.03	3	0.02
Poland	Y	A	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Portugal	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Romania	Y	C	0	0	0.00	0.00	0	0.00	1	0.01	0	0.00	0	0.00
Slovakia	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Slovenia	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	1	0.05
Spain	Y	C	1	1	0.00	0.00	0	0.00	0	0.00	0	0.00	2	0.00
Sweden	Y	C	1	1	0.01	0.01	1	0.01	1	0.01	0	0.00	0	0.00
United Kingdom	Y	C	26	26	0.04	0.04	13	0.02	16	0.03	16	0.03	4	0.01
EU total	-	-	**36**	**35**	**0.01**	**0.01**	**21**	**0.00**	**19**	**0.00**	**25**	**0.01**	**16**	**0.00**
Iceland	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	1	0.02
Total	-	-	**36**	**35**	**0.01**	**0.01**	**21**	**0.00**	**19**	**0.00**	**25**	**0.01**	**17**	**0.00**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

four cases, the Netherlands two, and Denmark, France, Spain and Sweden all reported one case each. No cases were reported in the remaining EU/EEA countries in 2011. All reported cases were related to travel.

The number of cases reported in 2011 represents an increase compared to the number of infections detected in previous years (Figure 2.3.10). The rise of cases can be attributed to the United Kingdom which reported 36 cases in 2011 (89.4%) against only 13, 16, 16 and four cases reported in 2010, 2009, 2008 and 2007, respectively.

Age and gender distribution

In 2011, information on age was available for all 35 confirmed cases. The majority of cases (12) occurred among 25–44-year-olds and 45–64-year-olds. However, the highest case rate was identified in the age group 0–4 years, with 0.02 cases per 100 000 population.

Seasonality

In 2011, the seasonal pattern of reported cholera cases was slightly different to that in previous years, with cases peaking in June and October (Figure 2.3.12).

Discussion

Cholera is a sporadic, travel-associated disease in the EU. In 2011, a notable increase of travel-related cholera cases was reported in the EU, with the United Kingdom experiencing the greatest increase in infections and reporting almost 75% of the total cases. The rise in cases also coincided with a change in their seasonal distribution.

Cholera outbreaks are common in several developing countries, and cases showed a steady expansion across different regions of Africa and the Caribbean in 2011. There has been an ongoing cholera outbreak in Haiti and the Dominican Republic since the beginning of 2011, a few months after the earthquake[1].

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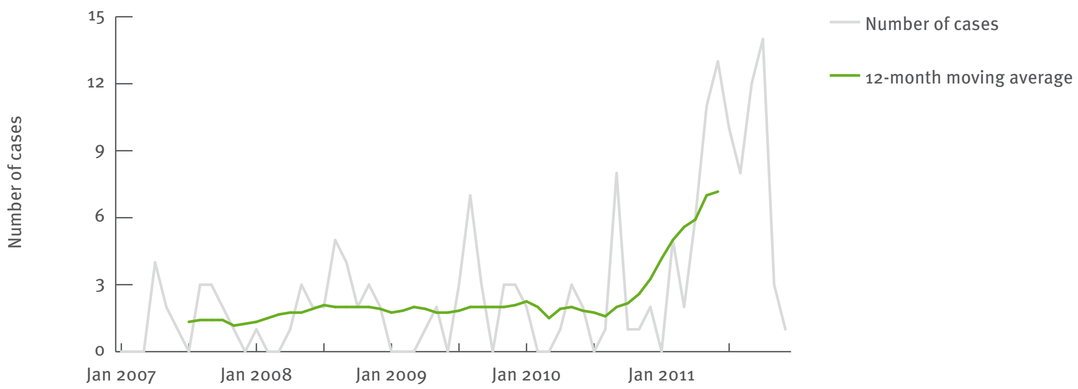
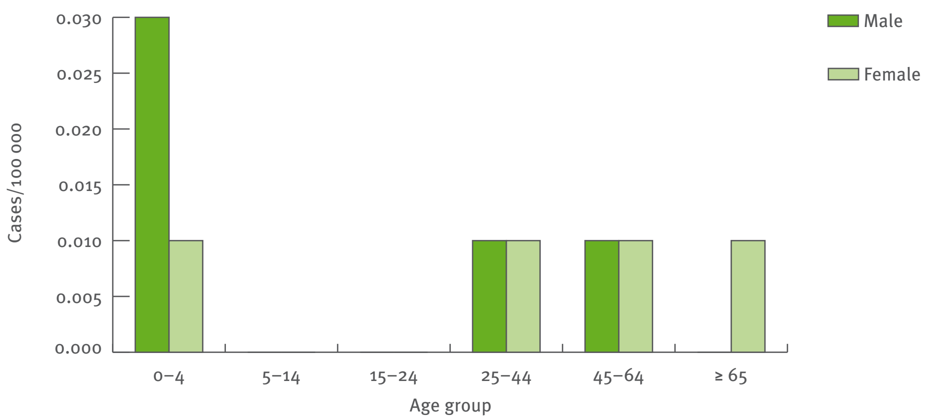
Figure 2.3.10. Trend and number of confirmed cases of cholera reported in the EU/EEA, 2007–2011



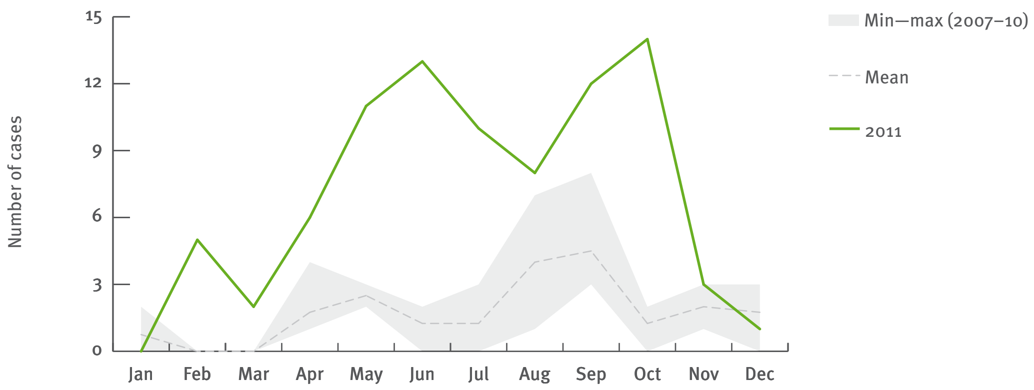
Source: Country reports from Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Figure 2.3.11. Rates of confirmed cholera cases reported in the EU/EEA, by age and gender, 2011



Source: Country reports from Denmark, France, Germany, the Netherlands, Spain, Sweden and the United Kingdom.

Figure 2.3.12. Seasonal distribution: Number of confirmed cases of cholera by month, EU/EEA, 2007–2011



Source: Country reports from Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by				National coverage	National reference laboratory data	Comparable data available	Case definition used
						Laboratories	Physicians	Hospitals	Others				
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Belgium	BE-REFLAB	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	Not specified/unknown
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	Y	-	-	EU-2008
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y	-	-	EU-2008
Denmark	DK-MIS	Cp	Co	P	C	N	Y	N	N	Y	-	-	Other
Estonia	EE-PERTUSSIS/SHIGELLOSIS/SYPHILIS	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Finland	FI-NIDR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	Not specified/unknown
France	FR-NATIONAL_REFERENCE_CENTRES	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	Other
Germany	DE-SURVNET@RKI-7.1	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Hungary	HU-EFRIR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Ireland	IE-CIDR	Cp	Co	P	C	N	Y	Y	N	Y	-	-	Other
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU case definition (legacy/deprecated)
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Netherlands	NL-OSIRIS	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	Not specified/unknown
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Portugal	PT-SHIGELLOSIS	Cp	Co	P	C	N	Y	N	N	Y	Y	1950	Other
Romania	RO-RNSSy	Cp	Co	P	C	N	N	Y	N	Y	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y	-	-	EU-2008
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Spain	ES-STATUTORY_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
United Kingdom	UK-SHIGELLOSIS	O	Co	P	C	Y	N	Y	Y	Y	-	-	Other

Cryptosporidiosis

- The overall rate of reporting confirmed that cryptosporidiosis cases have been relatively constant, about two cases per 100 000 population, in the EU/EEA countries over the past five years.
- Young children below five years of age are most at risk, with case rates of 13.8 and 10.5 per 100 000 population for males and females, respectively.
- In the second half of 2012, several countries reported an unusual increase in case numbers but no common epidemiological link could be identified.

Cryptosporidiosis is an acute diarrhoeal disease, which is caused by an infection of the small intestine with an intracellular protozoan parasite. There are two main species of the parasite infecting humans; *Cryptosporidium parvum* and *Cryptosporidium hominis*. The disease is normally self-limiting and treatment, if required, is mainly supportive. Young children and immunocompromised patients in particular are at increased risk of developing the disease more severely. Transmission is by the faecal-oral-route via contaminated water, soil or food products and the most common vehicle is contaminated drinking water or recreational water. The parasite's oocysts (spores) are excreted in the faeces and can survive for a long time in the environment. The oocysts are resistant to chlorine at concentrations normally used for the treatment of drinking water. There are well documented large outbreaks of cryptosporidiosis caused by the contamination of reticulated drinking water at source. *Cryptosporidiae* are sensitive to light and UV-light treatment of drinking water is effective in preventing the spread of oocysts. The most effective preventive measures at the point of use of potentially contaminated water are to boil drinking water and wash hands.

Epidemiological situation in 2011

In 2011, 5 697 confirmed cases of cryptosporidiosis were reported by 21 EU/EEA countries (Table 2.3.6). The highest case rate was observed in Ireland (nine cases per 100 000) followed by United Kingdom (five cases per 100 000), and Sweden (four cases per 100 000). The overall crude rate in the EU/EEA countries was 1.95 cases per 100 000 population. The confirmed cases reported by Belgium and Spain were not included in the calculation of the overall disease rate, as their national surveillance systems for cryptosporidiosis reporting do not cover the whole population. The rate of confirmed cases of cryptosporidiosis in the EU/EEA countries has been relatively constant over the past five years (Figure 2.3.13).

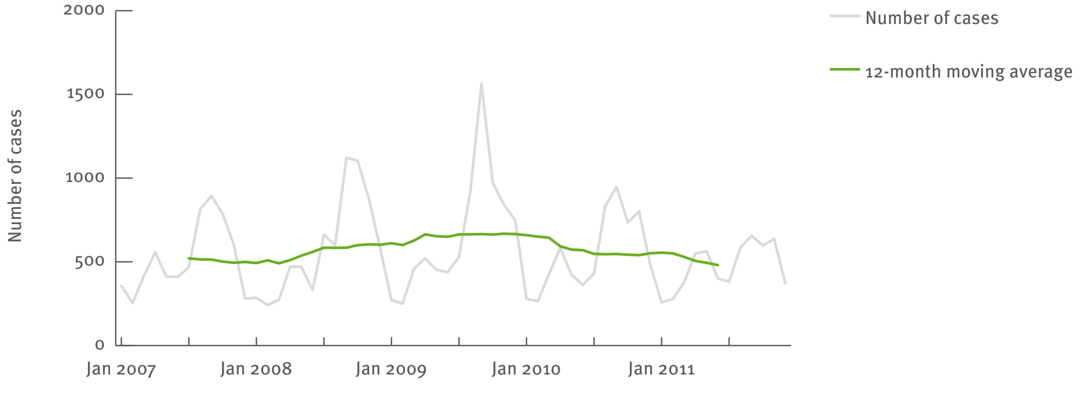
Age and gender distribution

Information on gender was provided for 5 635 confirmed cases in the EU/EEA countries. In 2011, the male-to-female ratio was largely balanced (1:1.04). Information on age group and gender was provided for 5 618 confirmed cases in the EU/EEA countries. The highest reported age-specific rate was seen in 0–4-year-old male children with 13.8 cases per 100 000, followed by 0–4-year-old female children with 10.5 cases per 100 000 population (Figure 2.3.14).

Seasonality

The incidence of cryptosporidiosis follows a seasonal pattern in Europe, with a peak during late summer and autumn. Over the last five years, the number of reported cases has roughly doubled against the annual average

Figure 2.3.13. Trend and number of confirmed cases of cryptosporidiosis reported in the EU/EEA, 2007–2011



Source: Country reports from Austria, Cyprus, the Czech Republic, Estonia, Finland, Germany, Hungary, Ireland, Italy, Lithuania, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

during the high season and quadrupled against the incidence in the winter months. In 2011, this pattern was less distinct and the number of reported cases during the high season was below the normally observed interval (Figure 2.3.15).

Updates from epidemic intelligence in 2012

In October 2012, the Netherlands posted an alert regarding a six- to 14-fold increase in reported cases of cryptosporidiosis across the country compared to previous years. The most frequently isolated species was *Cryptosporidium hominis* with the dominant type 1bA10G2. This is the most frequent sub-type found in humans in the Netherlands in recent years. The United Kingdom and Germany subsequently responded that they had also detected significant increases in cryptosporidiosis cases during the second half of 2012[1]. In November 2012, Finland reported an increase in the number of cases from October and November. According to the affected countries, the increase was unlikely to be due to surveillance or notification artefacts. The information available from laboratory and epidemiological investigations by spring 2013 did not indicate a single source outbreak[1]. There was no evidence that the increase in the number of reported cases notified by Finland was associated with the increases reported by any of the other countries. Therefore, the overall threat for the EU was considered to be low. However, Member States were encouraged to closely monitor the occurrence of cases, particularly in relation to immunocompromised and other population groups at higher risk.

Discussion

Cryptosporidiosis is an important cause of acute diarrhoeal disease worldwide. Of the 21 EU/EEA countries reporting data on cryptosporidiosis, seven countries reported zero cases and three countries reported just one case. In addition, nine countries did not report data on cryptosporidiosis at all. It is therefore likely that cryptosporidiosis is underreported in the EU. The reasons for this underreporting may be the self-limiting nature of the disease and the low ascertainment rate.

Table 2.3.6. Numbers and rates of confirmed cryptosporidiosis cases reported in the EU/EEA, 2007–2011

Country	2011						2010		2009		2008		2007	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population			Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Rate	Age-standardised rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	Y	C	18	18	0.21	0.23	3	0.04	0	0.00	13	0.16	9	0.11
Belgium	N	C	244	244	-	-	275	-	470	-	397	-	259	-
Bulgaria	Y	A	0	0	0.00	0.00	1	0.01	1	0.01	0	0.00	0	0.00
Cyprus	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Czech Republic	Y	C	0	0	0.00	0.00	1	0.01	0	0.00	0	0.00	0	0.00
Denmark	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Estonia	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Finland	Y	C	22	22	0.41	0.41	19	0.36	11	0.21	11	0.21	11	0.21
France	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Germany	Y	C	942	930	1.14	1.26	918	1.13	1106	1.35	1014	1.24	1459	1.78
Greece	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hungary	Y	C	14	14	0.14	0.15	34	0.35	15	0.15	10	0.10	6	0.06
Ireland	Y	C	428	413	9.04	6.65	294	6.58	445	10.00	412	9.36	611	14.17
Italy	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Latvia	Y	C	14	14	0.68	0.71	23	1.02	9	0.40	0	0.00	0	0.00
Lithuania	Y	C	1	1	0.03	0.03	2	0.06	0	0.00	0	0.00	0	0.00
Luxembourg	Y	C	1	1	0.20	0.18	1	0.20	0	0.00	0	0.00	0	0.00
Malta	Y	C	0	0	0.00	0.00	1	0.24	0	0.00	0	0.00	0	0.00
Netherlands	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Poland	Y	A	1	1	0.00	0.00	0	0.00	5	0.01	1	0.00	0	0.00
Portugal	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Romania	Y	C	0	0	0.00	0.00	8	0.04	8	0.04	0	0.00	-	-
Slovakia	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Slovenia	Y	C	10	10	0.49	0.51	7	0.34	3	0.15	6	0.30	1	0.05
Spain	N	C	79	79	-	-	57	-	197	-	75	-	136	-
Sweden	Y	C	379	379	4.03	4.11	392	4.20	159	1.72	148	1.61	110	1.21
United Kingdom	Y	C	3571	3571	5.76	5.40	4569	7.42	5587	9.07	4941	8.13	3653	6.05
EU total	-	-	**5724**	**5697**	**1.96**	**2.31**	**6605**	**2.29**	**8016**	**2.68**	**7028**	**2.40**	**6255**	**2.33**
Iceland	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	**5724**	**5697**	**1.96**	**2.31**	**6605**	**2.29**	**8016**	**2.68**	**7028**	**2.40**	**6255**	**2.33**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

Outbreaks, which are usually caused by contamination of drinking or recreational water, may happen at any time of the year. Human activities, such as drinking untreated water, recreational water activities and contact with farm animals, increase the risk of becoming infected with *Cryptosporidium*.

References

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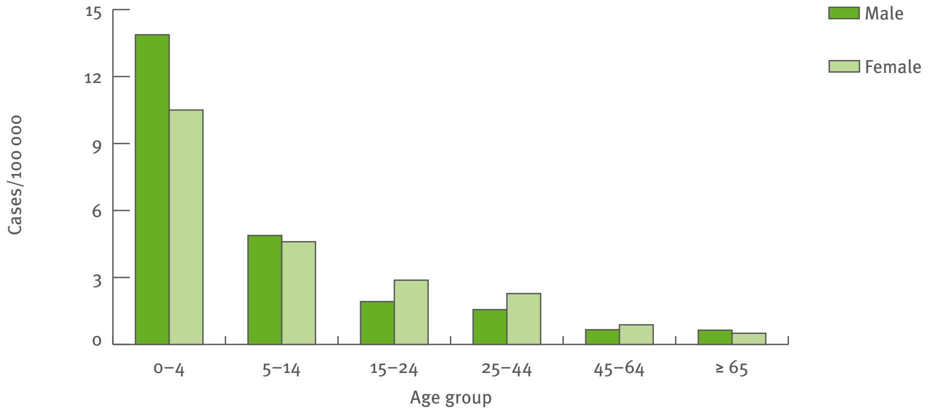
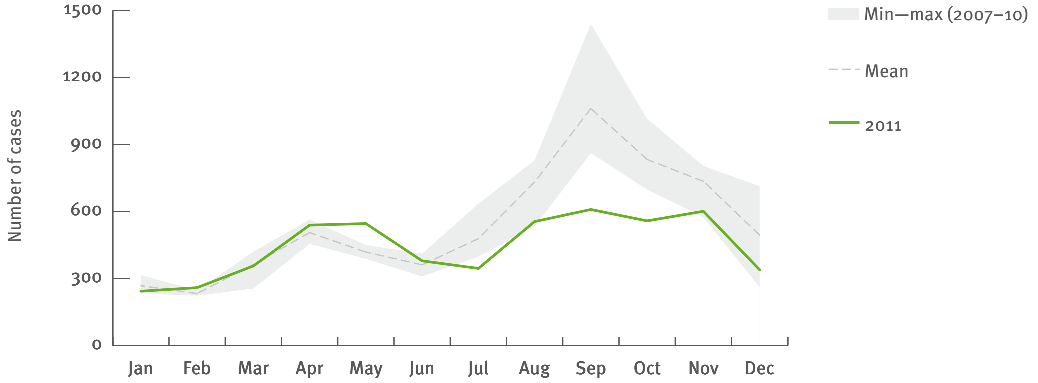
Figure 2.3.14. Rates of confirmed cryptosporidiosis cases reported in the EU/EEA, by age and gender, 2011



Source: Country reports from Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Estonia, Finland, Germany, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Malta, Poland, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Figure 2.3.15. Seasonal distribution: Number of confirmed cases of cryptosporidiosis by month, EU/EEA, 2007–2011



Source: Country reports from Austria, Cyprus, the Czech Republic, Estonia, Finland, Germany, Hungary, Ireland, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by				National coverage	National reference laboratory data	Comparable data available	Case definition used
						Laboratories	Physicians	Hospitals	Others				
Austria	AT-Reflab	V	O	P	C	Y	N	N	N	Y	-	-	EU-2008
Belgium	BE-LABNET	V	Se	A	C	Y	N	-	-	Y	-	-	Not specified/unknown
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	Y	-	-	EU-2008
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y	-	-	EU-2008
Estonia	EE-CRYPTOSPORIDIOSIS	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU case definition (legacy/deprecated)
Finland	FI-NIDR	Cp	Co	P	C	Y	N	N	N	Y	-	-	Not specified/unknown
Germany	DE-SURVNET@RKI-7.1	Cp	Co	P	C	Y	N	N	Y	Y	-	-	Other
Hungary	HU-EFRIR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Ireland	IE-CIDR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU case definition (legacy/deprecated)
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	N	Y	Y	N	Y	-	-	EU-2008
Romania	RO-RNSSy	Cp	Co	P	A	N	N	Y	N	Y	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y	-	-	EU-2008
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Spain	ES-MICROBIOLOGICAL	V	Se	P	C	Y	N	N	N	N	-	-	EU-2008
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
United Kingdom	UK-CRYPTOSPORIDIOSIS	O	Co	P	C	Y	N	Y	Y	Y	-	-	Other

Echinococcosis (hydatid disease)

- In 2011, the case rate of echinococcosis was 0.18 cases per 100 000 population in the EU/EEA.
- Between 2009 and 2011 the rate of echinococcosis cases remained stable at the EU level.
- Bulgaria had the highest disease rate, 4.09 cases per 100 000 population, and accounted for 39% (307 confirmed cases) of the total reported number of cases.

Echinococcosis is an uncommon disease in the EU, caused by infections with the larval stage of *Echinococcus* tapeworms. Echinococcosis manifests in two forms depending on the causative species: alveolar echinococcosis (AE) is caused by *E. multilocularis* and cystic echinococcosis (CE) is caused by *E. granulosus*. Human infection occurs through ingestion of tapeworm eggs, most commonly through contact with infected dogs (*E. granulosus* particularly), foxes and raccoon dogs (*E. multilocularis* particularly) or their environment, which has become contaminated with egg-containing faeces. The incubation period ranges from five to 15 years and results in slow-developing, potentially fatal, tumour-like cysts in the liver (cystic echinococcosis) or lungs (alveolar echinococcosis).

Epidemiological situation in 2011

In 2011, 26 of the 30 EU/EEA countries reported 784 confirmed cases of human echinococcosis (Table 2.3.7). This represents an increase of 6.2% on 2010. The overall case rate (0.18 cases per 100 000 in 2011) stabilised between the years 2009 and 2011, after a statistically significant decreasing trend during the preceding four-year period (2006–2009). Since 2007, the 12-month moving average of total case numbers has been relatively stable (Figure 2.3.16). As in 2010, Bulgaria and Germany accounted for the majority of confirmed cases, with 57.2% of all cases coming from these two countries. Bulgaria had the highest notification rate (4.09 cases per 100 000 population), which was more than 20 times the EU average (Table 2.3.7).The case–fatality rate was 0.4 % (one death in Germany, two in Romania)[1].

Age and gender distribution

Information on both age and gender was provided for 420 confirmed cases. The male-to-female ratio was 0.92:1 in 2011. The highest case rate was in males aged 65 years and over (0.18 per 100 000) followed by females aged 65 years and over (0.15 per 100 000) (Figure 2.3.17).

Seasonality

In 2011, the highest number of echinococcosis cases was reported in March. However, over the last five years the number of reported cases of human echinococcosis has fluctuated throughout the year without clear seasonality (Figure 2.3.18).

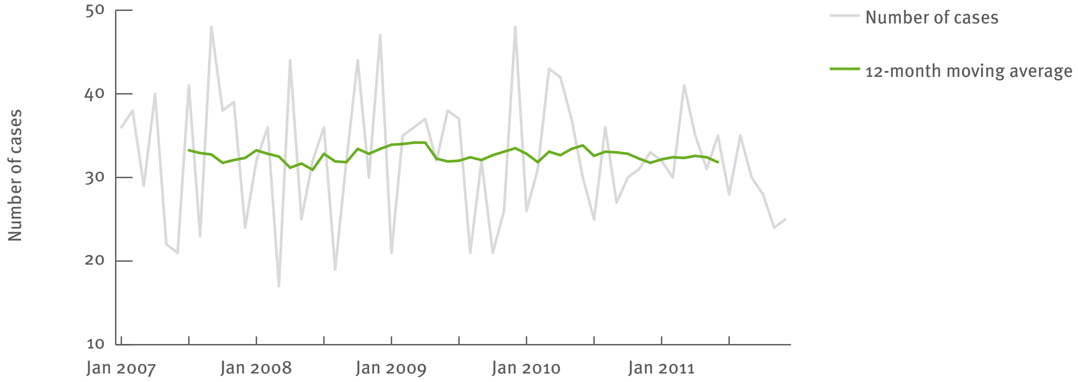
Enhanced surveillance in 2011

The EFSA and ECDC European Union *Summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2011*, provides information on the distribution of cases by species. Species information was available for 79.8% of the confirmed cases. Of these, 85.1% were *E. granulosus* and 14.9% *E. multilocularis*. The relative proportion of *E. multilocularis* has increased over the last five years, from 7.0% in 2007 to 14.9% in 2011, with a corresponding decrease in the proportion of *E. granulosus* cases reported[1].

Discussion

Cases of echinococcosis are reported in most EU countries, although numbers are low and the majority of cases come from just a few countries. Between 2009 and

Figure 2.3.16. Trend and number of confirmed cases of echinococcosis reported in the EU/EEA, 2007–2011



Source: Country reports from Austria, Belgium, Cyprus, the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Latvia, Lithuania, Malta, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

2011, the case rate remained constant at EU level, following a significant four-year decreasing trend between 2006 and 2009. With regard to age, higher case rates detected in the elderly can be explained by the long incubation period of several years. Continued preventive control measures – mandatory medicinal treatment against *E. multilocularis* – are required for dogs travelling to a country that has been declared free of *E. multilocularis* in definitive (canid) hosts[2].

In recent years, the quality of data reported on *Echinococcus* in animals has improved, with more information being provided about the sampling context and more data reported at species level. Data on parasite speciation are very important for risk management as *E. granulosus* and *E. multilocularis* have different epidemiology and pose different health risks to humans[1]. There is evidence that *E. multilocularis* is spreading in Europe[3–7] with the relative proportion of cases reported in the last five years having more than doubled. Surveillance of *E. multilocularis* in foxes is important in order to assess the prevalence of this parasite in Europe.

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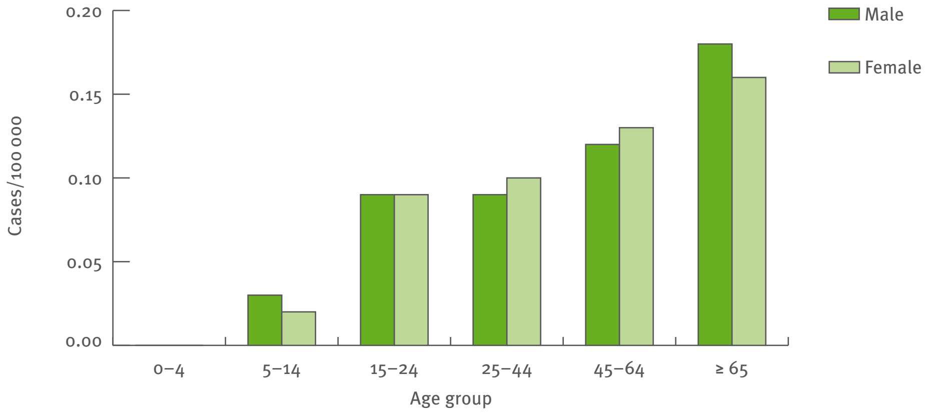
Table 2.3.7. Numbers and rates of confirmed echinococcosis cases reported in the EU/EEA, 2007–2011

Country	2011						2010		2009		2008		2007	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population			Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Rate	Age-standardised rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	Y	C	7	7	0.08	0.08	21	0.25	20	0.24	6	0.07	16	0.19
Belgium	Y	A	1	1	0.01	0.01	1	0.01	0	0.00	0	0.00	1	0.01
Bulgaria	Y	A	307	307	4.09	4.08	291	3.85	323	4.25	386	5.05	461	6.00
Cyprus	Y	C	2	2	0.24	0.24	0	0.00	1	0.13	1	0.13	4	0.51
Czech Republic	Y	C	0	0	0.00	0.00	5	0.05	1	0.01	2	0.02	3	0.03
Denmark	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Estonia	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	1	0.08	2	0.15
Finland	Y	C	1	1	0.02	0.02	1	0.02	1	0.02	1	0.02	1	0.02
France	Y	C	46	45	0.07	0.07	14	0.02	27	0.04	14	0.02	25	0.04
Germany	Y	C	142	142	0.17	0.17	117	0.14	106	0.13	102	0.12	89	0.11
Greece	Y	C	17	17	0.15	0.15	11	0.10	22	0.20	28	0.25	10	0.09
Hungary	Y	C	11	11	0.11	0.11	9	0.09	8	0.08	7	0.07	8	0.08
Ireland	Y	C	0	0	0.00	0.00	1	0.02	1	0.02	2	0.05	0	0.00
Italy	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Latvia	Y	C	10	10	0.45	0.43	14	0.62	15	0.66	21	0.93	12	0.53
Lithuania	Y	C	25	24	0.74	0.73	23	0.69	36	1.08	32	0.95	12	0.36
Luxembourg	Y	C	1	1	0.20	0.23	1	0.20	0	0.00	0	0.00	0	0.00
Malta	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Netherlands	Y	A	49	49	0.29	0.29	-	-	25	0.15	12	0.07	6	0.04
Poland	Y	C	19	19	0.05	0.04	34	0.09	25	0.07	28	0.07	40	0.11
Portugal	Y	C	1	1	0.01	0.01	3	0.03	4	0.04	4	0.04	10	0.09
Romania	Y	C	53	53	0.25	0.25	55	0.26	42	0.20	119	0.55	99	0.46
Slovakia	Y	C	2	2	0.04	0.04	9	0.17	4	0.07	5	0.09	4	0.07
Slovenia	Y	C	8	8	0.39	0.39	8	0.39	9	0.44	7	0.35	1	0.05
Spain	Y	C	53	53	0.12	0.11	82	0.18	86	0.19	109	0.24	131	0.30
Sweden	Y	C	19	19	0.20	0.21	30	0.32	12	0.13	13	0.14	24	0.26
United Kingdom	Y	C	9	9	0.01	0.01	7	0.01	7	0.01	9	0.02	7	0.01
EU total	**-**	**-**	**783**	**781**	**0.18**	**0.18**	**737**	**0.18**	**775**	**0.18**	**909**	**0.21**	**966**	**0.22**
Iceland	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	3	3	0.06	0.06	1	0.02	0	0.00	2	0.04	0	0.00
Total	**-**	**-**	**786**	**784**	**0.18**	**0.18**	**738**	**0.17**	**775**	**0.18**	**911**	**0.21**	**966**	**0.22**

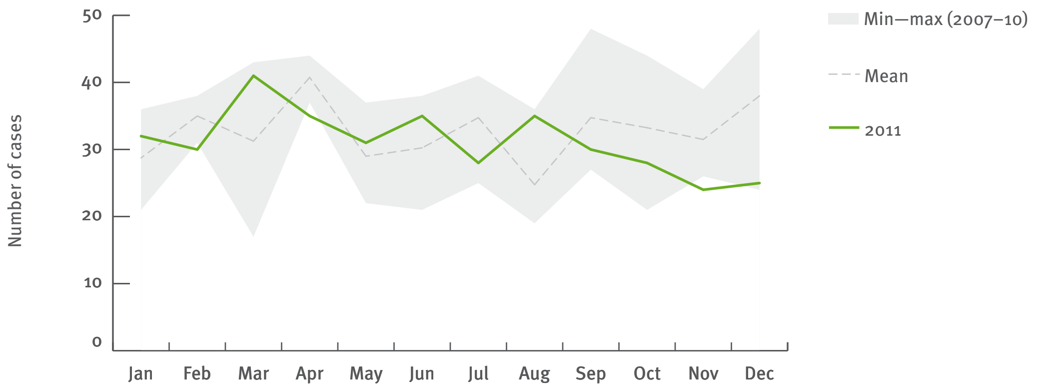
Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

Figure 2.3.17. Rates of confirmed echinococcosis cases reported in the EU/EEA, by age and gender, 2011



Source: Country reports from Austria, Belgium, Bulgaria, Cyprus, Finland, France, Germany, Greece, Hungary, Latvia, Lithuania, Luxembourg, Norway, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain , Sweden and the United Kingdom.

Figure 2.3.18. Seasonal distribution: Number of confirmed cases of echinococcosis by month, EU/EEA, 2007–2011



Source: Country reports: Austria, Belgium, Cyprus, Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Latvia, Lithuania, Malta, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by				National coverage
						Laboratories	Physicians	Hospitals	Others	
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	Y
Belgium	BE-REFLAB	V	Co	A	C	Y	N	N	N	Y
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	Y
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y
Estonia	EE-ECHINOCOCCOSIS	Cp	Co	P	C	Y	Y	Y	Y	Y
Finland	FI-NIDR	Cp	Co	P	C	Y	Y	N	N	Y
France	FR-FRANCEECHINO	V	Co	P	C	Y	Y	Y	Y	Y
Germany	DE-SURVNET@RKI-7.3	Cp	Co	P	C	Y	N	N	N	Y
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y
Hungary	HU-Zoonoses	Cp	Co	P	C	Y	Y	Y	N	Y
Ireland	IE-CIDR	Cp	Co	P	C	Y	Y	Y	N	Y
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	Y	Y	N	N	Y
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y
Netherlands	NL-LIMS	V	Co	P	A	Y	N	N	-	Y
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	Y
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	N	Y	Y	N	Y
Portugal	PT-ECHINOCOCCOSIS	Cp	Co	P	C	N	Y	N	N	Y
Romania	RO-RNSSy	Cp	Co	P	A	N	N	Y	N	Y
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y
Spain	ES-STATUTORY_DISEASES	Cp	Co	P	C	N	Y	Y	N	Y
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y
United Kingdom	UK-ECHINOCOCCOSIS	V	Co	P	C	Y	N	Y	Y	Y

Shiga toxin/verocytotoxin-producing *Escherichia coli* (STEC/VTEC) infection

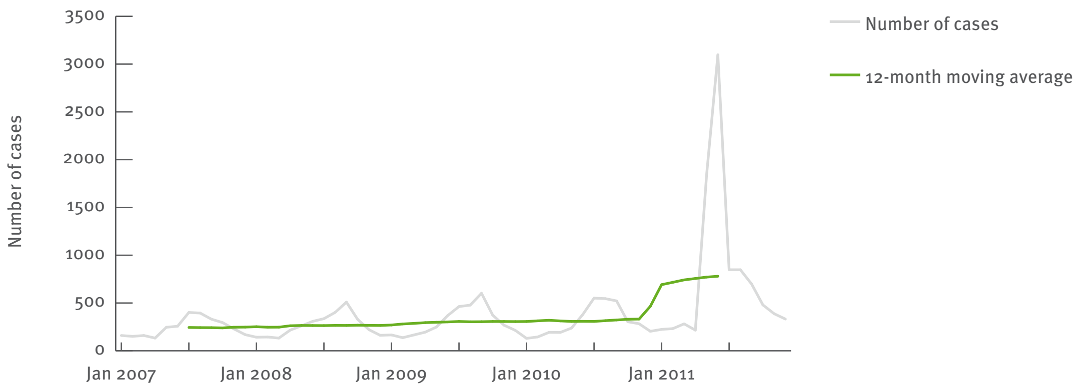
- A large national outbreak with more than 3 816 human cases occurred in Germany during the summer of 2011. The outbreak was associated with consumption of beansprouts contaminated with VTEC O104:H4, a rare *E. coli* pathotype[1].
- The total number of confirmed VTEC cases reported was 9 534 and the overall notification rate was 2.54 cases per 100 000 population in EU/EEA countries in 2011. This marked increase in cases and notification rate was mainly due to the outbreak in Germany.
- The most commonly reported O serogroups were O157 and O104.
- VTEC O104 was the predominant serogroup in haemolytic uremic syndrome (HUS) cases among all age groups above 15 years in 2011 due to the outbreak.

Human infection with Shiga toxin/verocytotoxin-producing *Escherichia coli* (STEC/VTEC) is characterised by an acute onset of diarrhoea, which may be bloody, and is often accompanied with mild fever and/or vomiting. The infection may lead to potentially fatal haemolytic uremic syndrome (HUS), affecting renal function and requiring hospital care. Infection is mainly acquired by consuming contaminated food, such as undercooked or contaminated beef or vegetables, or water, but person-to-person and direct transmissions from animals to humans may also occur. The main reservoirs for STEC/VTEC bacteria are ruminants such as cattle, goats and sheep.

Epidemiological situation in 2011

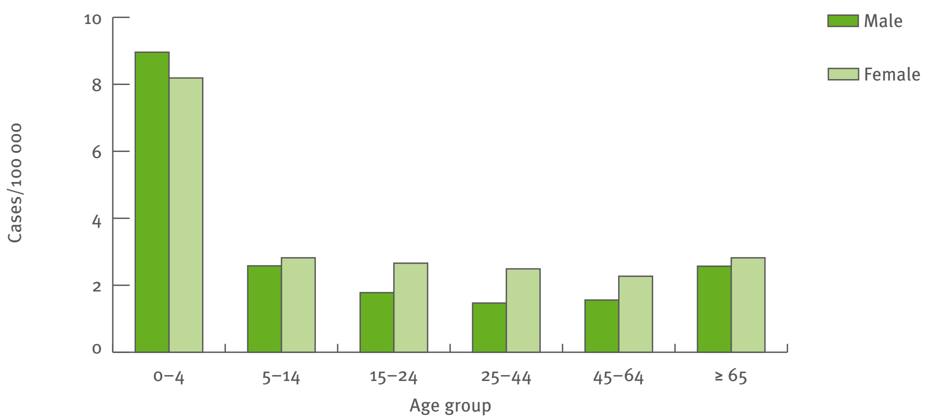
In 2011, 9 534 confirmed cases of STEC/VTEC were reported by 27 EU/EEA countries. This represents 2.5 times the number of confirmed cases reported in 2010 (n=3 715). The overall notification rate was also higher in 2011: 2.54 cases per 100 000 compared with 1.00 cases per 100 000 in 2010, (Table 2.3.8). This marked increase

Figure 2.3.19. Trend and number of confirmed cases of STEC/VTEC reported in the EU/EEA, 2007–2011



Source: Country reports from Austria, Bulgaria, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Iceland, Latvia, Lithuania, Luxembourg, Malta, Norway, Poland, Portugal, Slovakia, Slovenia, Sweden and the United Kingdom.

Figure 2.3.20. Rates of confirmed STEC/VTEC cases reported in the EU/EEA, by age and gender, 2011



Source: Country reports from Austria, Belgium, Bulgaria, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Malta, the Netherlands, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

was mainly due to a large, beansprout-associated outbreak of VTEC O104:H4, which occurred in Germany in the early summer of 2011.

Germany accounted for 58.6% (n=5 558) of all confirmed cases reported and also had the highest notification rate in 2011 (6.80 per 100 000 population). Overall, the number of confirmed cases reported increased in 18 Member States compared to 2010. Between 2009 and 2011, the Netherlands showed a steady rise in the number of reported confirmed cases, resulting in a 169% increase since 2009 (Table 2.3.8). Since 2007, the trend of confirmed STEC/VTEC cases had been stable in the EU until the sharp increase in 2011 due to the VTEC O104:H4 outbreak (Figure 2.3.19).

Age and gender distribution

Among the 27 EU/EEA countries with known data on gender, 24.4% more female than male cases were reported, with the female-to-male ratio 1.32:1. However, the highest rate of confirmed cases was reported in 0–4-year-old males (8.92 cases per 100 000 population). As in previous years and despite the German outbreak, the notification rates in children under five years were higher than in the other age groups (Figure 2.3.20).

Seasonality

The number of reported cases of STEC/VTEC showed a sharp peak in May–June 2011 due to the VTEC O104:H4 outbreak in Germany (Figure 2.3.21). There is a clear seasonality, indicating that STEC/VTEC infections are mainly acquired and reported in the summer months between June and September.

Enhanced surveillance in 2011

Complete serotype (O and H antigen) data were reported for 702 (7.4%) VTEC cases whereas data on the O serogroups were reported for 56% of confirmed human infections in 2011. The most commonly reported O serogroups were O157 (41%) followed by O104 (20%). As in previous years, the United Kingdom and Ireland accounted for 76% of O157 associated confirmed cases, while Germany

Table 2.3.8. Numbers and rates of confirmed STEC/VTEC cases reported in the EU/EEA, 2007–2011

Country	2011						2010		2009		2008		2007	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population			Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Rate	Age-standardised rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	Y	C	129	120	1.43	1.53	88	1.05	91	1.09	69	0.83	82	0.99
Belgium	N	C	100	100	-	-	84	-	96	-	103	-	47	-
Bulgaria	Y	A	1	1	0.01	0.01	0	0.00	0	0.00	0	0.00	0	0.00
Cyprus	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	2	0.25	0	0.00
Czech Republic	Y	C	7	7	0.07	0.06	-	-	-	-	-	-	-	-
Denmark	Y	C	225	215	3.87	3.70	178	3.22	160	2.90	161	2.94	156	2.86
Estonia	Y	C	4	4	0.30	0.30	5	0.37	4	0.30	3	0.22	3	0.22
Finland	Y	C	28	27	0.50	0.48	21	0.39	29	0.54	8	0.15	12	0.23
France	N	C	221	221	-	-	103	-	93	-	85	-	58	-
Germany	Y	C	5 638	5 558	6.80	6.93	955	1.17	887	1.08	876	1.07	870	1.06
Greece	Y	C	1	1	0.01	0.01	1	0.01	0	0.00	0	0.00	2	0.02
Hungary	Y	C	11	11	0.11	0.12	7	0.07	1	0.01	0	0.00	1	0.01
Ireland	Y	C	285	275	6.14	4.99	197	4.41	237	5.33	213	4.84	115	2.67
Italy	N	C	69	51	-	-	33	-	51	-	26	-	27	-
Latvia	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Lithuania	Y	C	0	0	0.00	0.00	1	0.03	0	0.00	0	0.00	0	0.00
Luxembourg	Y	C	14	14	2.74	2.65	7	1.39	5	1.01	4	0.83	1	0.21
Malta	Y	C	2	2	0.48	0.47	1	0.24	8	1.93	8	1.95	4	0.98
Netherlands	Y	C	845	845	5.07	5.08	478	2.88	314	1.91	92	0.56	88	0.54
Poland	Y	C	5	5	0.01	0.01	3	0.01	0	0.00	3	0.01	2	0.01
Portugal	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Romania	Y	C	2	2	0.01	0.01	2	0.01	0	0.00	4	-	0	0.00
Slovakia	Y	C	5	5	0.09	0.09	10	0.18	14	0.26	8	0.15	6	0.11
Slovenia	Y	C	25	25	1.22	1.24	20	0.98	12	0.59	7	0.35	4	0.20
Spain	Y	C	20	20	0.04	0.04	18	0.04	14	0.03	24	0.05	19	0.04
Sweden	Y	C	477	467	4.96	4.85	334	3.58	228	2.46	304	3.31	262	2.88
United Kingdom	Y	C	1509	1509	2.41	2.34	1110	1.79	1339	2.17	1164	1.90	1149	1.89
EU total	-	-	**9 623**	**9485**	**2.57**	**2.57**	**3656**	**1.00**	**3583**	**0.97**	**3164**	**0.92**	**2 908**	**0.81**
Iceland	Y	C	2	2	0.63	0.49	2	0.63	8	2.51	4	1.27	13	4.23
Liechtenstein	-	-	-	-	-	-	-	-	-	-	0	0.00	-	-
Norway	Y	C	47	47	0.96	0.89	52	1.07	108	2.25	22	0.46	26	0.56
Total	-	-	**9 672**	**9 534**	**2.54**	**2.54**	**3710**	**1.00**	**3 699**	**0.99**	**3190**	**0.91**	**2 947**	**0.81**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

accounted for 89% of O104-associated confirmed cases due to the large national outbreak associated with this serogroup (Table 2.3.9).

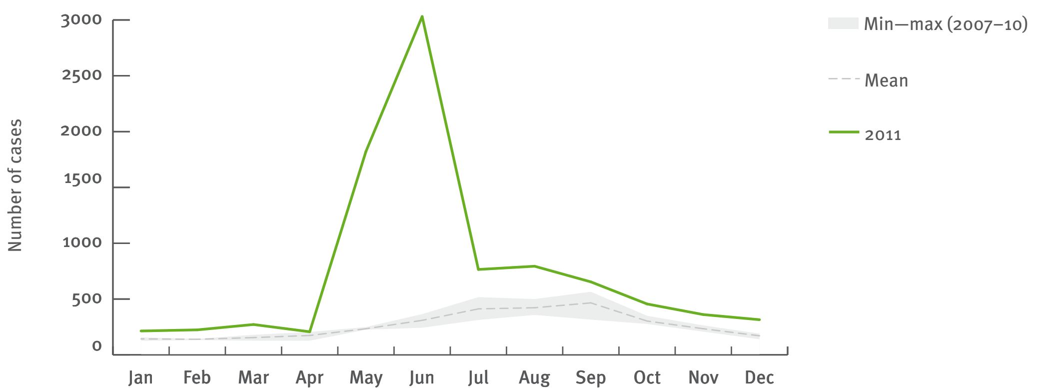
Data on HUS were reported by 15 EU/EEA countries[2]. A total of 1 006 (11%) confirmed VTEC cases (n=9 672) developed HUS in 2011. Only 318 of these cases were reported to be due to STEC/VTEC O104 but of the 411 HUS cases with unknown serogroups reported from Germany, the majority are expected to have been caused by the outbreak. Twenty-eight per cent of HUS cases (n=162) were reported in 0–4-year-old children with O157 and O26 as the dominant serogroups, followed by 25–44-year-old adults with O104 as the dominant serogroup (91%). VTEC O104 was the predominant serogroup in HUS cases for all age groups above 15 years in 2011 (Figure 2.3.22).

Updates from epidemic intelligence in 2012

On 25 May 2012, the Netherlands issued an EWRS (Early Warning and Response System) message reporting a case of VTEC O104:H4 for one of the staff working at a laboratory. The person carried out cleaning tasks in the laboratory. The clinical signs were gastroenteritis with thrombocytopenia and renal function failure. The laboratory analysis identified the same genetic profile as the VTEC O104:H4, which caused the STEC outbreak in Germany in 2011. Epidemiological investigation revealed that the patient had been handling material contaminated with this pathogen. No other workers at the laboratory reported having developed symptoms of gastroenteritis and no secondary cases occurred among household contacts. The National Food Safety Authority (FSA) was notified immediately. The patient reported not having consumed raw vegetables (or fenugreek/sprouted seeds) but had eaten fresh mint leaves. PCR results on the leaves obtained from three shops where the patient bought this food item were positive for VTEC O104. Further laboratory diagnostic analysis was able to differentiate the VTEC O104 isolated strain from the 'German' VTEC O104 strain.

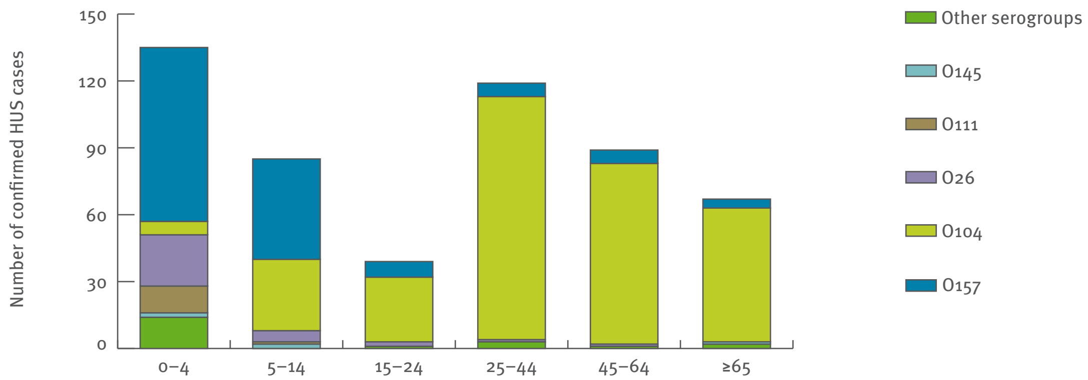
At present, the most plausible hypothesis is that the contamination occurred at the laboratory where the patient worked, as both isolates from the laboratory and the patient are genetically indistinguishable.

Figure 2.3.21. Seasonal distribution: Number of confirmed cases of STEC/VTEC by month, EU/EEA, 2007–2011



Source: Country reports from Austria, Bulgaria, Cyprus, Denmark, Estonia, Finland, Germany, Greece, Hungary, Ireland, Iceland, Latvia, Lithuania, Luxembourg, Malta, Norway, Poland, Portugal, Slovakia, Slovenia, Sweden and the United Kingdom.

Figure 2.3.22. Number of confirmed STEC/VTEC HUS cases, by age and most common O-serogroups, 2011



Source: Data from Austria, Belgium, the Czech Republic, Denmark, France, Germany, Hungary, Italy, Ireland, the Netherlands, Poland, Slovenia, Spain, Sweden and the United Kingdom (n=577).

Discussion

In 2011, there were 9 534 confirmed human cases reported due to VTEC infection, which represents a marked increase on previous years. The reason for this was a large German outbreak caused by VTEC O104:H4, a rare *E. coli* pathotype, associated with the consumption of contaminated raw beansprout seeds. This outbreak is by far the largest HUS outbreak ever described, with 845 HUS cases recorded, predominantly in adults and mainly in women[1].

In June 2011, France also reported an outbreak of cases associated with VTEC O104:H4. In total, there were 15 cases that developed HUS or bloody diarrhoea after attending an event[3]. Investigations suggested that the vehicle of transmission was the beansprouts served at this event. The STEC O104:H4 strain was isolated from five patients and the strains showed similar genetic and virulence characteristics to the German outbreak strain.

The German outbreak has also led to changes in European food hygiene legislation regarding VTEC associated with the production of beansprout seeds for consumption. Changes include traceability, import certification and approval of establishments. The legislation will enter into force in 2013[4]. This stresses the importance of checking raw vegetables and seeds for microbiological pathogens traditionally associated with food production animals.

References

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3. Gault G, Weill FX, Mariani-Kurkdjian P, Jourdan-da Silva N, King L, Aldabe B, et al. Outbreak of haemolytic uraemic syndrome and bloody diarrhoea due to *Escherichia coli* O104:H4, south-west France, June 2011. Eurosurveillance. 2011;16(26).
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Table 2.3.9. **Most commonly reported O-serogroups in confirmed STEC/VTEC cases, EU/EEA, 2011**

Country	Serogroup										
	O157	O104	O26	O103	O91	O145	O128	O111	O146	NT	Other
Austria	30	4	14	4	5	3	1	10	5	14	27
Belgium	65	-	7	4	-	3	-	-	1	-	6
Denmark	27	25	15	22	-	10	7	7	13	7	79
Czech Republic	3	1	2	-	-	1	-	-	-	-	-
Estonia	-	-	-	-	-	-	1	-	-	3	-
France	79	18	36	7	2	3	5	4	-	50	3
Germany	138	944	85	54	90	38	29	18	13	56	182
Greece	-	1	-	-	-	-	-	-	-	-	-
Hungary	3	-	2	-	1	-	-	-	-	2	1
Ireland	200	-	49	-	-	2	3	1	3	6	11
Italy	14	-	9	7	-	4	-	5	-	3	-
Luxembourg	1	2	2	1	1	2	-	-	-	4	1
Malta	2	-	-	-	-	-	-	-	-	-	-
Netherlands	65	11	20	8	8	4	-	2	8	603	116
Poland	2	3	-	-	-	-	-	-	-	-	-
Romania	1	-	1	-	-	-	-	-	-	-	-
Slovakia	-	-	-	-	-	-	-	-	-	5	-
Slovenia	7	-	4	1	1	-	-	-	2	4	6
Spain	16	1	1	-	-	-	1	1	-	-	-
Sweden	62	48	29	32	8	6	6	4	3	32	49
United Kingdom	1470	6	11	1	-	-	-	-	-	5	4
EU total	**2185**	**1064**	**287**	**141**	**116**	**76**	**53**	**52**	**48**	**794**	**485**
Iceland	2	-	-	-	-	-	-	-	-	-	-
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-
Norway	11	2	13	2	7	-	4	1	-	-	7
Total	**2198**	**1066**	**300**	**143**	**123**	**76**	**57**	**53**	**48**	**794**	**485**

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by: Laboratories	Data reported by: Physicians	Data reported by: Hospitals	Data reported by: Others	National coverage	National reference laboratory data	Comparable data available	Case definition used
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Belgium	BE-REFLAB	V	Se	A	C	Y	N	N	N	Y	-	-	Not specified/unknown
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	Y	-	-	EU-2008
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y	-	-	EU-2008
Denmark	DK-LAB	Cp	Co	P	C	Y	N	N	N	Y	-	-	Other
Estonia	EE-EHEC	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Finland	FI-NIDR	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
France	FR-NATIONAL_REFERENCE_CENTRES	V	Co	P	C	Y	N	N	N	N	-	-	Other
Germany	DE-SURVNET@RKI-7.1	Cp	Co	P	C	Y	N	N	Y	Y	-	-	Other
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Hungary	HU-Zoonoses	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Ireland	IE-VTEC	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Italy	IT-ENTERNET	V	Se	P	C	Y	N	N	N	-	-	-	Other
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU case definition (legacy/deprecated)
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Luxembourg	LU-LNS-Microbio	V	Co	P	C	Y	N	Y	N	Y	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Netherlands	NL-ENTEROHAEMORHAGIC_ECOLI	Cp	Co	A	C	Y	Y	N	N	Y	Y	2001	Other
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	Not specified/unknown
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Romania	RO-RNSSy	Cp	Co	P	C	N	N	Y	N	Y	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y	-	-	EU-2008
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Spain	ES-NRL	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
United Kingdom	UK-ENTEROHAEMORHAGIC_ECOLI	O	Co	A	C	Y	N	Y	Y	Y	-	-	Other

Giardiasis

- The rate of confirmed cases of giardiasis reported in EU/EEA countries has been relatively constant over the past five years.
- In 2011, the crude disease reporting rate for giardiasis was 5.49 cases per 100 000 population in the EU/EEA.
- In 2011, human giardiasis was most commonly diagnosed in children under five years, with the highest case rate for males recorded at 11.2 cases per 100 000 population.

Giardia lamblia (synonym *G. duodenalis* or *G. intestinalis*) is a flagellated, cyst-producing intestinal parasite able to infect humans and animals. Giardiasis is the most common cause of parasitic, diarrheal disease worldwide. Individuals become infected through ingesting contaminated food, soil, or water or by person-to-person transmission. *Giardia* cysts can survive for extended periods of time in the environment, and a major reservoir of the parasite is contaminated surface water. Waterborne outbreaks due to inadequate treatment of drinking water are frequently reported, and infants and children are at particular risk of infection. Infected individuals can remain asymptomatic or develop fatigue and bloating

Table 2.3.10. Numbers and rates of confirmed giardiasis cases reported in the EU/EEA, 2007–2011

Country	2011						2010		2009		2008		2007	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population			Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Rate	Age-standardised rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	Y	C	74	74	0.88	0.90	59	0.70	31	0.37	47	0.57	66	0.80
Belgium	N	C	1383	1383	-	-	1212	-	1218	-	1213	-	1081	-
Bulgaria	Y	A	1959	1959	26.10	28.91	2234	29.54	2096	27.56	2141	28.02	0	0.00
Cyprus	Y	C	2	2	0.24	0.25	12	1.47	2	0.25	7	0.89	4	0.51
Czech Republic	Y	C	45	45	0.43	0.44	51	0.49	47	0.45	79	0.76	90	0.88
Denmark	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Estonia	Y	C	245	245	18.28	18.22	257	19.18	207	15.44	264	19.69	418	31.14
Finland	Y	C	404	404	7.52	7.73	373	6.97	378	7.10	427	8.06	294	5.57
France	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Germany	Y	C	4258	4230	5.17	5.34	3980	4.87	3962	4.83	4763	5.79	3651	4.44
Greece	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hungary	Y	C	85	85	0.85	0.88	87	0.87	100	1.00	138	1.37	86	0.85
Ireland	Y	C	57	56	1.25	1.14	57	1.28	62	1.39	70	1.59	62	1.44
Italy	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Latvia	Y	C	15	15	0.67	0.67	21	0.93	18	0.80	28	1.23	34	1.49
Lithuania	Y	C	8	8	0.25	0.25	18	0.54	13	0.39	15	0.45	23	0.68
Luxembourg	Y	C	0	0	0.00	0.00	0	0.00	2	0.41	1	0.21	0	0.00
Malta	Y	C	10	10	2.40	2.57	5	1.21	2	0.48	2	0.49	10	2.45
Netherlands	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Poland	Y	A	1736	1670	4.37	-	2271	5.95	2184	5.73	3096	8.12	2981	7.82
Portugal	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Romania	N	A	315	315	-	-	106	-	296	-	-	-	-	-
Slovakia	Y	C	162	162	2.98	2.97	169	3.12	139	2.57	125	2.31	122	2.26
Slovenia	Y	C	32	31	1.51	1.53	19	0.93	9	0.44	14	0.70	17	0.85
Spain	N	C	530	530	-	-	578	-	869	-	683	-	904	-
Sweden	Y	C	1045	1045	11.10	11.09	1311	14.04	1210	13.07	1529	16.65	1413	15.51
United Kingdom	Y	C	3938	3938	6.30	6.29	4024	6.49	3719	6.04	3632	5.94	3257	5.36
EU total	-	-	**16303**	**16207**	**5.50**	**5.78**	**16844**	**5.89**	**16564**	**5.60**	**18274**	**6.48**	**14513**	**4.97**
Iceland	Y	C	34	34	10.68	10.04	24	7.56	27	8.45	33	10.46	46	14.95
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	234	234	4.76	4.58	262	5.39	308	6.42	270	5.70	290	6.20
Total	-	-	**16571**	**16475**	**5.49**	**5.76**	**17130**	**5.88**	**16899**	**5.62**	**18577**	**6.47**	**14849**	**5.00**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

followed by acute or chronic diarrhoea that can lead to dehydration and malabsorption.

Epidemiological situation in 2011

In 2011, a total of 16 475 confirmed cases of giardiasis were reported by 23 EU/EEA countries (Table 2.3.10). The highest notification rate was observed in Bulgaria (26 per 100 000) followed by Estonia (18 per 100 000), Sweden (11 per 100 000) and Iceland (10 per 100 000). The overall crude case rate in the EU/EEA countries was 5.49 cases per 100 000 population. It should be noted that the confirmed cases reported by Belgium, Spain and Romania were not included in the calculation of country-specific rates as their national surveillance systems for *Giardia* reporting did not cover the whole population. The disease rate for confirmed cases of giardiasis in the EU/EEA countries has been relatively constant over the past five years (Figure 2.3.23).

Age and gender distribution

Information on gender was provided for 14 393 confirmed cases in EU/EEA countries. In 2011, the male-to-female ratio was 1.17:1. Information on age groups and gender was reported for 12 407 confirmed cases. As in previous years, the highest case rate was observed in the 0–4 year age group for both males and females. The highest notification rate was in 0–4 year old male children with 11.2 per 100 000, followed by 0–4 year old female children with 9.8 per 100 000 population. (Figure 2.3.24).

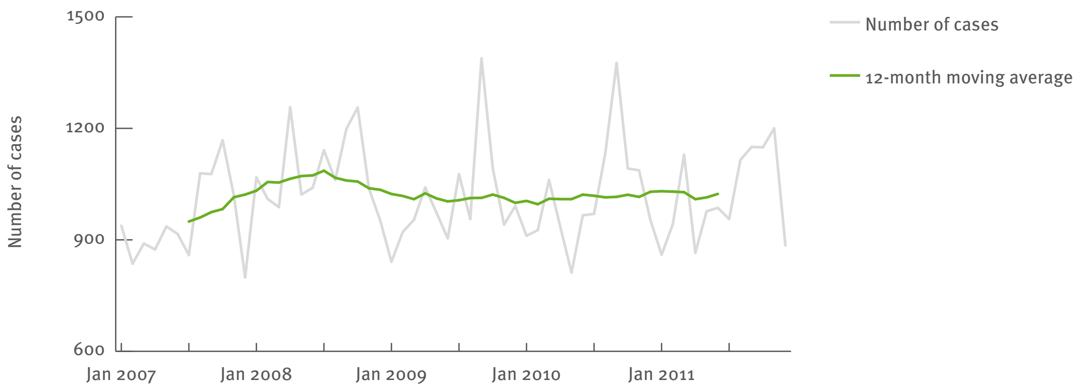
Seasonality

Data on seasonality was available for 12 531 reported cases from 22 countries. No strong seasonality was observed, which was consistent with previous years. A small increase in reported cases was observed in the autumn (Figure 2.3.25).

Discussion

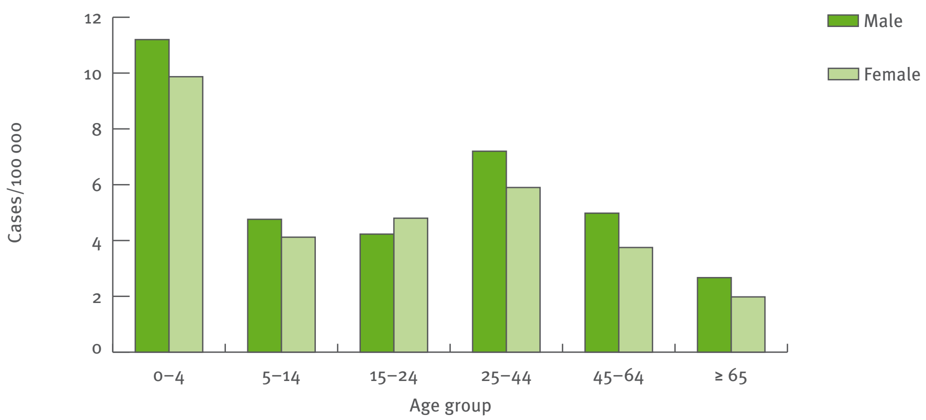
Cases of giardiasis are reported in most EU countries. The case rate of confirmed cases of giardiasis reported in EU/EEA countries has been relatively constant over the past five years. In previous years, Romania has reported high case numbers of giardiasis and it is likely that the disease rate would increase at EU/EEA level if the reporting system for giardiasis cases could be validated in

Figure 2.3.23. Trend and number of confirmed cases of giardiasis reported in the EU/EEA, 2007–2011



Source: Country reports from Austria, Cyprus, the Czech Republic, Finland, Germany, Hungary, Ireland, Iceland, Malta, Norway, Slovakia, Slovenia, Sweden and the United Kingdom.

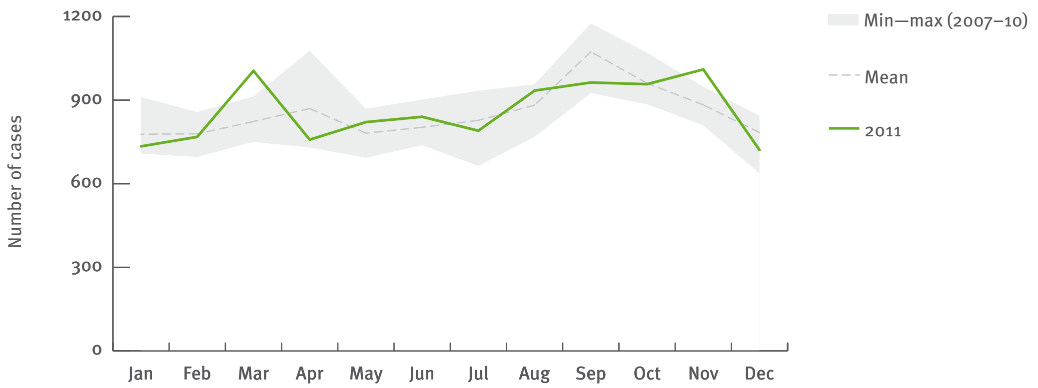
Figure 2.3.24. Rates of confirmed giardiasis cases reported in the EU/EEA, by age and gender, 2011



Source: Country reports from Austria, Belgium, Cyprus, the Czech Republic, Estonia, Finland, Germany, Hungary, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Malta, Norway, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Romania. In ECDC's annual epidemiological report for 2010, which presented the 2008 data, the cases from Romania constituted 90% of all reported cases, resulting in a total of almost 170 000 cases. These high case numbers were later withdrawn because of uncertainties with the case classification in the national surveillance system.

Figure 2.3.25. Seasonal distribution: Number of confirmed cases of giardiasis by month, EU/EEA, 2007–2011



Source: Country reports from Austria, Cyprus, the Czech Republic, Finland, Germany, Hungary, Ireland, Iceland, Malta, Norway, Slovakia, Slovenia, Sweden and the United Kingdom.

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by				National coverage	National reference laboratory data	Comparable data available	Case definition used
						Laboratories	Physicians	Hospitals	Others				
Austria	AT-Reflab	V	O	P	C	Y	N	N	N	Y	-	-	EU-2008
Belgium	BE-LABNET	V	Se	A	C	Y	N	-	-	Y	-	-	Not specified/unknown
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	Y	-	-	EU-2008
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y	-	-	EU-2008
Estonia	EE-HBV/GIARDIASIS	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Finland	FI-NIDR	Cp	Co	P	C	Y	N	N	N	Y	-	-	Not specified/unknown
Germany	DE-SURVNET@RKI-7.1	Cp	Co	P	C	Y	N	N	Y	Y	-	-	Other
Hungary	HU-EFRIR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Ireland	IE-CIDR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU case definition (legacy/deprecated)
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	Not specified/unknown
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	N	Y	Y	N	Y	-	-	EU-2008
Romania	RO-RNSSy	-	Se	P	A	N	Y	Y	N	Y	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Spain	ES-MICROBIOLOGICAL	V	Se	P	C	Y	N	N	N	N	-	-	EU-2008
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
United Kingdom	UK-GIARDIASIS	O	Co	P	C	Y	N	Y	Y	Y	-	-	Other

Hepatitis A

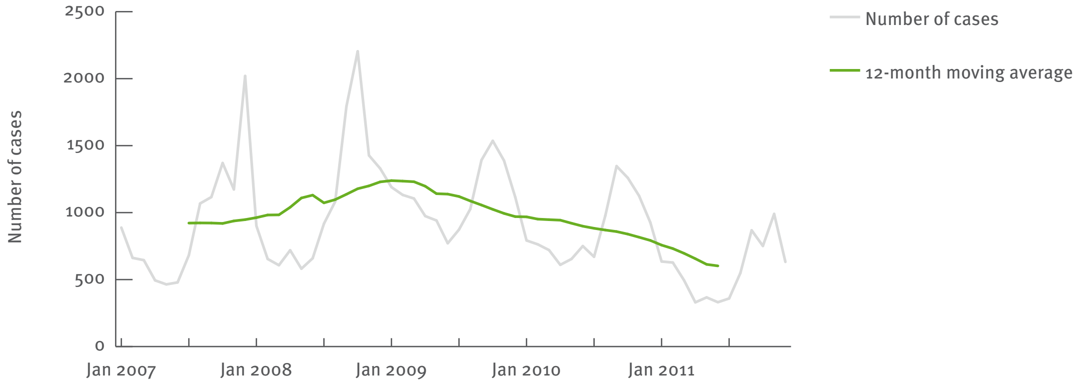
- The overall rate of confirmed hepatitis A cases was 2.51 per 100 000 population in 2011.
- In 2011, the most affected age groups in the EU/EEA countries were children between five and 14 years of age.
- Children under five years usually experience an asymptomatic infection so the incidence of the disease is underreported.

Hepatitis A is an acute infection of the liver caused by a hepatotropic picornavirus. Humans are the only reservoir for the infection which is spread via the faecal-oral route and transmitted from person-to-person or indirectly by means of contaminated tap water or food. Common-source outbreaks are often associated with infected food handlers. Hepatitis A is usually a mild, self-limiting disease but in rare cases may develop to cause life-threatening, acute liver failure. The signs and symptoms of the disease differ according to the age of the patient. The infection in small children is usually asymptomatic, whereas infection in adults manifests after a two-to-six week incubation period with jaundice, fever, dark urine, fatigue and nausea. The infection leads to lifelong immunity. Hepatitis A occurs worldwide, and the infection is effectively prevented by vaccination.

Epidemiological situation in 2011

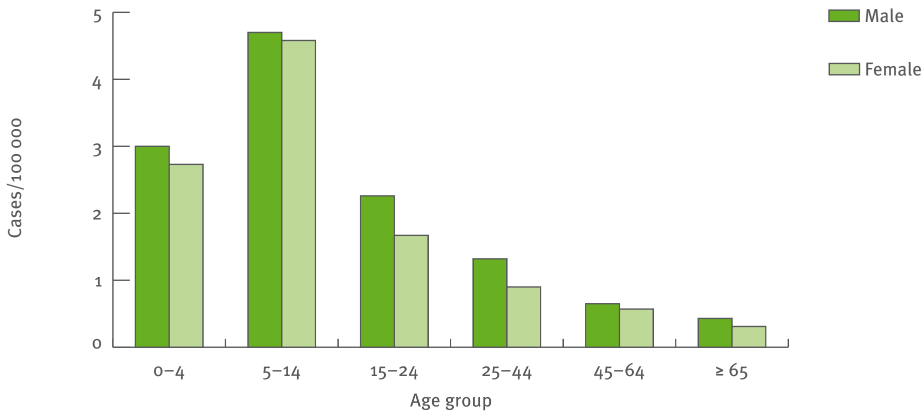
In 2011, 12 659 confirmed cases of hepatitis A were reported by 29 EU/EEA countries, giving a rate of 2.51 cases per 100 000 inhabitants (Table 2.3.11). The highest case rates were observed in Romania (12.05 cases per 100 000), Estonia (11.42 cases per 100 000) followed by Slovakia (7.36 cases per 100 000). All other countries

Figure 2.3.26. Trend and number of confirmed cases of hepatitis A reported in the EU/EEA, 2007–2011



Source: Country reports from Austria, Cyprus, the Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Iceland, Italy, Malta, the Netherlands, Norway, Portugal, Romania, Slovakia, Slovenia, Sweden and the United Kingdom.

Figure 2.3.27. Rates of confirmed hepatitis A cases reported in the EU/EEA, by age and gender, 2011



Source: Country reports from Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

reported a confirmed case rate below three per 100 000 inhabitants. The highest number of laboratory-confirmed cases were reported by Bulgaria (5 587) and Romania (2 581), followed by France (1 115).

Between 2007 and 2011, the confirmed case rate decreased from 2.81 per 100 000 in 2007 to 2.51 per 100 000, with an incidence peak at 3.51 per 100 000 in 2009. The trend in reported hepatitis A infections has been decreasing since 2009 (Figure 2.3.26).

Information regarding provenance of the infection was available for 2 801 cases. Among those, 2 106 were reported as autochthonous, whereas 695 cases were acquired while travelling abroad. Travel-related cases were reported by Austria (2), Denmark (8), Estonia (8), Finland (10), France (348), Germany (227), Greece (7), Hungary (5), Ireland (4), Lithuania (3), Malta (2), the Netherlands (51), Portugal (4), Slovenia (2) and Norway (14).

Age and gender distribution

Information regarding gender was available for 6 987 cases, of which 3 851 (55.1%) were male and 3 136 (44.9%) female (male-to-female ratio 1:1.23). Among the confirmed cases of hepatitis A reported in 2011, 765 (3.11%) occurred in the age group 0–4 years, 2 397 (5.01%) in the age group 5–14 years, 1 154 (2.15%) in the age group 15–24 years, 1 550 (1.19%) in the age group 25–44 and 816 (0.66%) cases in the age group 45–64 years, while 326 (0.38%) cases occurred in the over-65s. The highest case rates were observed in the age group 5–14 years: 5.08 per 100 000 for males and 4.93 per 100 000 for females (Figure 2.3.27).

Seasonality

In spite of the decreasing trend, hepatitis A infections have continued to show seasonality as in previous years. In 2011, the highest number of cases at the EU level was reported between September and November (Figure 2.3.28).

Table 2.3.11. Numbers and rates of confirmed hepatitis A cases reported in the EU/EEA, 2007–2011

Country	2011						2010		2009		2008		2007	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population			Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Rate	Age-standardised rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	Y	C	42	5	0.06	0.06	54	0.65	1	0.01	4	0.05	5	0.06
Belgium	N	C	167	167	-	-	137	-	130	-	365	-	209	-
Bulgaria	Y	A	5588	5587	74.45	-	2350	31.07	1064	13.99	907	11.87	2790	36.33
Cyprus	Y	C	0	0	0.00	0.00	2	0.24	4	0.50	4	0.51	4	0.51
Czech Republic	Y	C	264	264	2.51	2.63	862	8.20	1104	10.55	1649	15.89	126	1.23
Denmark	Y	C	13	13	0.23	0.23	47	0.85	45	0.82	44	0.80	306	5.62
Estonia	Y	C	154	153	11.42	11.63	6	0.45	19	1.42	13	0.97	10	0.75
Finland	Y	C	14	14	0.26	0.26	14	0.26	22	0.41	22	0.42	15	0.28
France	Y	C	1115	1115	1.71	1.67	1244	1.92	1547	2.40	1204	1.88	1010	1.59
Germany	Y	C	832	820	1.00	1.03	775	0.95	929	1.13	1072	1.30	936	1.14
Greece	Y	C	41	41	0.36	0.39	58	0.51	86	0.76	120	1.07	286	2.56
Hungary	Y	C	82	79	0.79	0.80	202	2.02	107	1.07	168	1.67	251	2.49
Ireland	Y	C	18	18	0.40	0.42	40	0.90	49	1.10	41	0.93	29	0.67
Italy	Y	C	315	315	0.52	0.56	655	1.09	1580	2.63	1350	2.26	1159	1.96
Latvia	Y	C	51	49	2.20	2.27	292	12.99	2276	100.65	2798	123.21	15	0.66
Lithuania	Y	C	17	17	0.52	0.51	10	0.30	16	0.48	20	0.59	23	0.68
Luxembourg	Y	C	0	0	0.00	0.00	2	0.40	5	1.01	3	0.62	1	0.21
Malta	Y	C	4	4	0.96	0.95	3	0.72	9	2.18	4	0.98	3	0.74
Netherlands	Y	C	115	115	0.69	0.68	252	1.52	154	0.93	87	0.53	165	1.01
Poland	Y	A	65	62	0.16	-	153	0.40	644	1.69	189	0.50	36	0.09
Portugal	Y	C	18	12	0.11	0.12	10	0.09	27	0.25	21	0.20	17	0.16
Romania	Y	C	2592	2581	12.05	12.35	3493	16.28	3734	17.37	3161	14.68	4982	23.10
Slovakia	Y	C	403	400	7.36	7.33	1449	26.71	1447	26.74	729	13.50	383	7.10
Slovenia	Y	C	12	11	0.54	0.53	9	0.44	12	0.59	17	0.85	15	0.75
Spain	Y	C	661	463	1.00	1.02	740	1.61	1808	3.95	1877	4.15	698	1.57
Sweden	Y	C	54	54	0.57	0.58	85	0.91	154	1.66	78	0.85	68	0.75
United Kingdom	Y	C	277	277	0.44	0.44	408	0.66	437	0.71	794	1.30	377	0.62
EU total	-	-	**12914**	**12636**	**2.54**	**1.58**	**13352**	**2.70**	**17410**	**3.53**	**16741**	**3.36**	**13919**	**2.83**
Iceland	Y	C	1	1	0.31	0.33	2	0.63	3	0.94	1	0.32	2	0.65
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	22	22	0.45	0.43	46	0.95	40	0.83	49	1.03	29	0.62
Total	-	-	**12937**	**12659**	**2.51**	**1.56**	**13400**	**2.68**	**17453**	**3.51**	**16791**	**3.34**	**13950**	**2.81**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

Discussion

The epidemiology of hepatitis A in the EU/EEA continues to indicate intermediate and low endemicity with confirmed case rates varying largely between countries. There were no outbreaks of hepatitis A reported in 2012. The age group distribution of cases in 2011 and previous years probably also reflects the clinical presentation of hepatitis A infection in the youngest age group, where the disease is often asymptomatic and therefore goes underreported. Seasonality in confirmed case rates across the EU, at the end of summer and the beginning of autumn, might reflect increased indigenous transmission in many countries when infected people return from visiting endemic areas during their summer holidays, causing local clusters.

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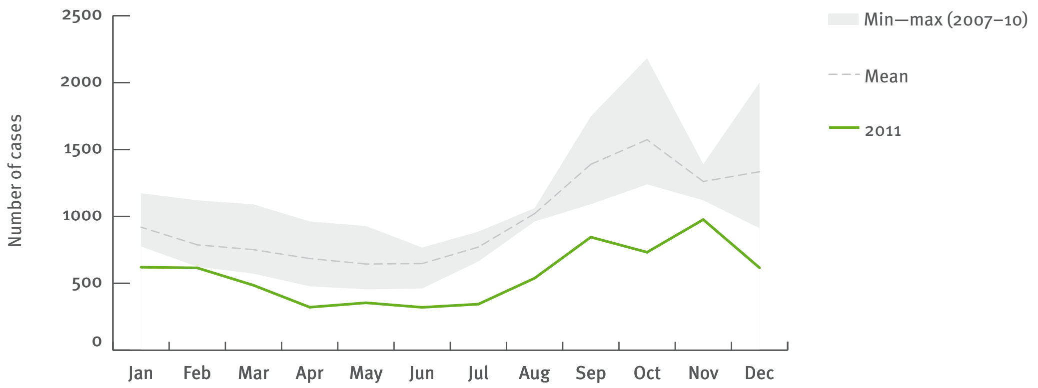
Figure 2.3.28. Seasonal distribution: Number of confirmed cases of hepatitis A by month, EU/EEA, 2007–2011



Source: Country reports from Austria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Malta, the Netherlands, Norway, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by: Laboratories	Physicians	Hospitals	Others	National coverage	National reference laboratory data	Comparable data available	Case definition used
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Belgium	BE-LABNET	V	Se	A	C	Y	N	-	-	Y	-	-	Not specified/unknown
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	Y	-	-	EU-2008
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y	-	-	EU-2008
Denmark	DK-MIS	Cp	Co	P	C	N	Y	N	N	Y	-	-	Other
Estonia	EE-HAV	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Finland	FI-NIDR	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
France	FR-MANDATORY_INFECTIOUS_DISEASES	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	Not specified/unknown
Germany	DE-SURVNET@RKI-7.1/6	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	Other
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Hungary	HU-EFRIR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Ireland	IE-CIDR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Italy	IT-NRS	Cp	Co	P	C	N	Y	Y	N	Y	-	-	Other
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU case definition (legacy/deprecated)
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Netherlands	NL-OSIRIS	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	Not specified/unknown
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	N	Y	Y	N	Y	-	-	EU-2008
Portugal	PT-HEPATITISA	Cp	Co	P	C	N	Y	N	N	Y	-	-	Other
Romania	RO-RNSSy	Cp	Co	P	C	N	N	Y	N	Y	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	Y	Y	-	-	EU-2008
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Spain	ES-STATUTORY_DISEASES	Cp	Co	P	C	N	Y	Y	N	Y	-	-	EU-2008
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
United Kingdom	UK-HEPATITISA	O	Co	P	C	Y	N	Y	N	Y	-	-	Other

Leptospirosis

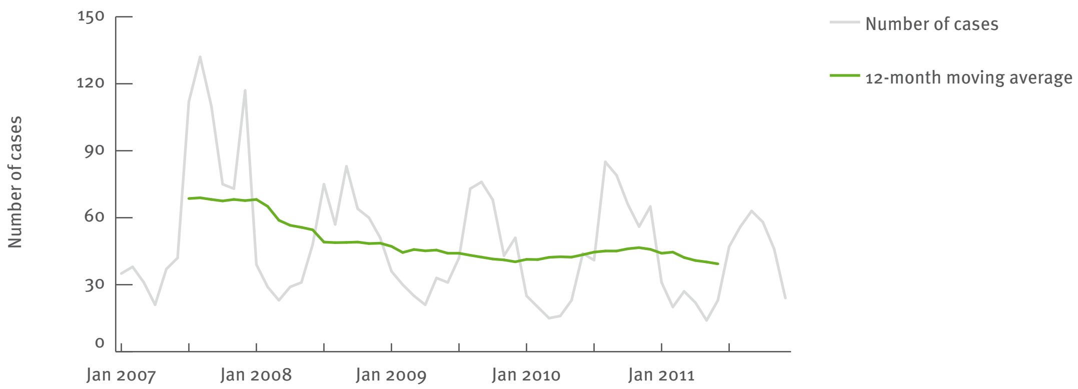
- Leptospirosis remains a rare disease in Europe.
- In 2011, the number of confirmed cases in EU countries remained stationary.
- Men of working age were mostly affected.
- The reported sporadic cases occurred mainly during summer and autumn and could be attributed to occupational or recreational exposure.
- No outbreak of leptospirosis was detected in 2011.

Leptospirosis is a zoonotic infectious disease caused by spirochaetes of the genus *Leptospira*. It is an environmental micro-organism, maintained in nature by chronic renal infection of wild and domestic animals. Human infection occurs either through animal bites (in which case the incubation period is very short), by direct contact with urine from an infected animal or their infected tissues, or by indirect exposure to *Leptospira* through contaminated damp soil or water. Most infected persons remain asymptomatic. The disease presents with different entities: a self-limited systemic illness (90 percent of all cases) or a severe, potentially fatal disease presenting with renal failure, liver failure and pneumonitis with haemorrhagic diathesis. Leptospirosis is endemic throughout the world except in the polar region.

Epidemiological situation in 2011

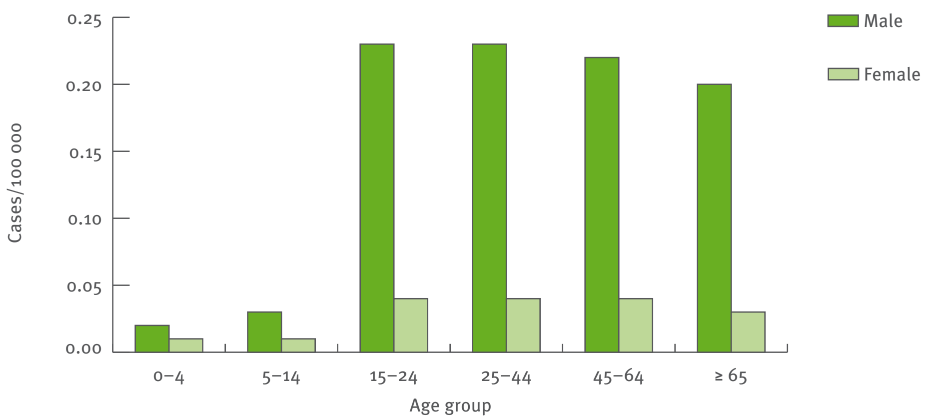
In 2011, 27 EU/EEA countries provided data on the disease. Iceland, Lichtenstein and Norway did not report any data. Overall, 526 confirmed cases of leptospirosis were reported, giving an overall case rate of 0.11 per 100 000 (Table 2.3.12). The highest rates were observed in Romania (0.46 per 100 000 inhabitants) followed by Slovenia (0.44 per 100 000 inhabitants) (Table 2.3.12). The highest numbers of confirmed cases were reported by Romania (98) and France (71).

Figure 2.3.29. Trend and number of confirmed cases of leptospirosis reported in the EU/EEA, 2007–2011



Source: Country reports from Austria, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Sweden and the United Kingdom.

Figure 2.3.30. Rates of confirmed leptospirosis cases reported in the EU/EEA, by age and gender, 2011



Source: Country reports from Austria, Belgium, Bulgaria, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Among the 526 confirmed cases, 146 were reported as being autochthonous, 64 were related to travel and 316 infections were of unknown origin. Travel-related cases were reported by Belgium (7), Denmark (4), France (3), Germany (19), Ireland (2), the Netherlands (17), and the United Kingdom (12). The trend has been declining since 2007 but stabilised between 2010 and 2011 (Figure 2.3.29).

Age and gender distribution

Among the 526 confirmed cases of leptospirosis reported in 2011, three cases were in the age group 0–4 years, ten in the age group 5–14 years, 74 in the age group 15–24 years, 171 in the age group 25–44 years, 161 cases were in the age group 45–64 years and 78 cases were over 65 years. The case rates were five times higher for males over 15 years of age than for females in the respective age categories (Figure 2.3.30). This was also reflected in the gender distribution; 425 were male and 87 were female with a male-to-female ratio 4.9:1.

Seasonality

During the summer and autumn of 2011, there was a seasonal increase in the number of reported leptospirosis cases reported. The number of cases started to increase in July, peaking in September and then declining progressively towards background reporting in December (Figure 2.3.31). The seasonal increase was mostly driven by a sharp increase in reported cases in Romania, France and Germany.

Discussion

Leptospirosis is an uncommon disease in Europe. In 2011, according to the collected data by TESSy, most of the leptospirosis cases were diagnosed in men of working age (24–64 years old). There were no outbreaks detected through ECDC's epidemic intelligence services. Most of the cases occurred during the summer and autumn when recreational and outdoor activities are most common.

Table 2.3.12. Numbers and rates of confirmed leptospirosis cases reported in the EU/EEA, 2007–2011

Country	2011						2010		2009		2008		2007	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population			Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Rate	Age-standardised rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	Y	C	9	3	0.04	0.03	9	0.11	9	0.11	11	0.13	9	0.11
Belgium	Y	A	15	15	0.14	0.00	9	0.08	8	0.07	5	0.05	8	0.08
Bulgaria	Y	A	12	12	0.16	0.16	11	0.15	11	0.15	9	0.12	16	0.21
Cyprus	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Czech Republic	Y	C	31	31	0.29	0.30	40	0.38	32	0.31	17	0.16	24	0.23
Denmark	Y	C	9	9	0.16	0.16	6	0.11	2	0.04	8	0.15	8	0.15
Estonia	Y	C	2	2	0.15	0.15	1	0.08	1	0.08	2	0.15	2	0.15
Finland	Y	C	8	8	0.15	0.15	0	0.00	12	0.23	8	0.15	2	0.04
France	Y	C	228	71	0.11	0.09	39	0.06	-	-	-	-	-	-
Germany	Y	C	51	50	0.06	0.06	70	0.09	92	0.11	66	0.08	165	0.20
Greece	Y	C	20	20	0.18	0.18	24	0.21	31	0.28	12	0.11	13	0.12
Hungary	Y	C	16	16	0.16	0.16	9	0.09	9	0.09	15	0.15	31	0.31
Ireland	Y	C	16	16	0.36	0.37	17	0.38	25	0.56	29	0.66	22	0.51
Italy	Y	C	24	24	0.04	0.04	21	0.04	38	0.06	40	0.07	45	0.08
Latvia	Y	C	7	6	0.27	0.26	2	0.09	5	0.22	3	0.13	2	0.09
Lithuania	Y	C	3	3	0.09	0.09	5	0.15	5	0.15	2	0.06	6	0.18
Luxembourg	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Malta	Y	C	1	1	0.24	0.26	1	0.24	3	0.73	2	0.49	1	0.25
Netherlands	Y	C	29	29	0.17	0.18	30	0.18	25	0.15	37	0.23	37	0.23
Poland	Y	C	4	3	0.01	0.01	4	0.01	4	0.01	2	0.01	7	0.02
Portugal	Y	C	34	33	0.31	0.30	29	0.27	32	0.30	15	0.14	38	0.36
Romania	Y	C	98	98	0.46	0.45	181	0.84	128	0.60	200	0.93	296	1.37
Slovakia	Y	C	7	7	0.13	0.14	27	0.50	16	0.30	23	0.43	17	0.32
Slovenia	Y	C	9	9	0.44	0.43	9	0.44	2	0.10	6	0.30	7	0.35
Spain	N	C	4	4	-	-	0	-	0	-	5	-	3	-
Sweden	Y	C	4	4	0.04	0.05	4	0.04	4	0.04	6	0.07	1	0.01
United Kingdom	Y	C	52	52	0.08	0.08	42	0.07	53	0.09	76	0.12	81	0.13
EU total	**-**	**-**	**693**	**526**	**0.11**	**0.11**	**590**	**0.13**	**547**	**0.14**	**599**	**0.15**	**841**	**0.22**
Iceland	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	**-**	**-**	**693**	**526**	**0.11**	**0.11**	**590**	**0.13**	**547**	**0.14**	**599**	**0.15**	**841**	**0.22**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

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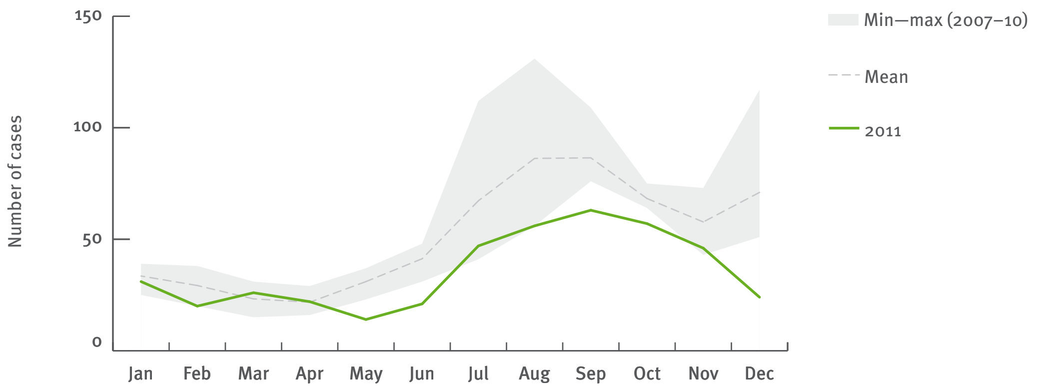
Figure 2.3.31. Seasonal distribution: Number of confirmed cases of leptospirosis by month, EU/EEA, 2007–2011



Source: Country reports from Austria, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Sweden and the United Kingdom.

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by				National coverage	National reference laboratory data	Comparable data available	Case definition used
						Laboratories	Physicians	Hospitals	Others				
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Belgium	BE-REFLAB	V	Co	P	C	Y	N	N	N	Y	-	-	Not specified/unknown
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	Y	-	-	EU-2008
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y	-	-	EU-2008
Denmark	DK-MIS	Cp	Co	P	C	N	Y	N	N	Y	-	-	Other
Estonia	EE-LEPTOSPIROSIS	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Finland	FI-NIDR	Cp	Co	P	C	Y	N	N	N	Y	-	-	Not specified/unknown
France	FR-NATIONAL_REFERENCE_CENTRES	V	Co	P	C	Y	N	N	N	-	-	-	Other
Germany	DE-SURVNET@RKI-7.1	Cp	Co	P	C	Y	N	N	Y	Y	-	-	Other
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Hungary	HU-EFRIR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Ireland	IE-CIDR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Italy	IT-NRS	Cp	Co	P	C	N	Y	Y	N	Y	-	-	Other
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU case definition (legacy/deprecated)
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Netherlands	NL-OSIRIS	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	N	Y	Y	N	Y	-	-	EU-2008
Portugal	PT-LEPTOSPIROSIS	Cp	Co	P	C	N	Y	N	N	Y	-	-	Other
Romania	RO-RNSSy	Cp	Co	P	C	N	N	Y	N	Y	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y	-	-	EU-2008
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Spain	ES-MICROBIOLOGICAL	V	Se	P	C	Y	N	N	N	N	-	-	EU-2008
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
United Kingdom	UK-LEPTOSPIROSIS	O	Co	P	C	Y	N	Y	Y	Y	-	-	Other

Listeriosis

- Listeriosis remains an uncommon disease in Europe.
- In 2011, the trend in the number of confirmed cases remained stable in EU/EEA countries.
- Listeriosis affected both genders almost equally.
- Cases occur predominantly among men and women over 65 years

Listeriosis is caused by a Gram-positive bacterium *Listeria monocytogenes*, which is widely distributed in the environment. It is commonly found in soil, decaying vegetation and water. Infection is acquired through consumption of contaminated food. *L. monocytogenes* can be found in many food types, including vegetables, raw milk, and raw meat but the infection is most likely to occur after consumption of certain ready-to-eat foods such as non-pasteurised milk products, meat and salmon products, where *Listeria* has been able to multiply during the cold-storage period[1-3]. *L. monocytogenes* usually causes a mild febrile illness, although severe and fatal systemic infections such as meningitis, encephalitis or endocarditis may occur in immunocompromised persons. *L. monocytogenes* infection during pregnancy may lead to a spontaneous abortion and neonatal death. Listeriosis is endemic throughout the world.

Table 2.3.13. Numbers and rates of confirmed listeriosis cases reported in the EU/EEA, 2007–2011

Country	2011						2010		2009		2008		2007	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population			Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Rate	Age-standardised rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	Y	C	26	26	0.31	0.29	34	0.41	46	0.55	31	0.37	20	0.24
Belgium	N	C	70	70	-	-	40	0.37	58	-	64	0.60	57	0.54
Bulgaria	Y	A	4	4	0.05	0.05	4	0.05	5	0.07	5	0.07	11	0.14
Cyprus	Y	C	2	2	0.24	0.27	1	0.12	0	0.00	0	0.00	0	0.00
Czech Republic	Y	C	35	35	0.33	0.33	26	0.25	32	0.31	37	0.36	51	0.50
Denmark	Y	C	49	49	0.88	0.86	62	1.12	97	1.76	51	0.93	58	1.07
Estonia	Y	C	3	3	0.22	0.22	5	0.37	3	0.22	8	0.60	3	0.22
Finland	Y	C	44	43	0.80	0.76	71	1.33	34	0.64	40	0.76	40	0.76
France	Y	C	282	282	0.43	0.42	312	0.48	328	0.51	276	0.43	319	0.50
Germany	Y	C	337	330	0.40	0.35	377	0.46	394	0.48	306	0.37	356	0.43
Greece	Y	C	9	9	0.08	0.07	10	0.09	4	0.04	1	0.01	10	0.09
Hungary	Y	C	11	11	0.11	0.11	20	0.20	16	0.16	19	0.19	9	0.09
Ireland	Y	C	7	7	0.16	0.16	10	0.22	10	0.23	13	0.30	21	0.49
Italy	Y	C	100	100	0.17	0.15	137	0.23	109	0.18	118	0.20	89	0.15
Latvia	Y	C	7	7	0.31	0.31	7	0.31	4	0.18	5	0.22	5	0.22
Lithuania	Y	C	6	6	0.19	0.18	5	0.15	5	0.15	7	0.21	4	0.12
Luxembourg	Y	C	2	2	0.39	0.47	0	0.00	3	0.61	1	0.21	6	1.26
Malta	Y	C	2	2	0.48	0.51	1	0.24	0	0.00	0	0.00	0	0.00
Netherlands	Y	C	87	87	0.52	0.54	72	0.43	44	0.27	45	0.27	68	0.42
Poland	Y	C	62	62	0.16	0.17	59	0.16	32	0.08	33	0.09	43	0.11
Portugal	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Romania	Y	C	9	9	0.04	0.04	6	0.03	6	0.03	0	0.00	0	0.00
Slovakia	Y	C	31	31	0.57	0.59	5	0.09	10	0.19	8	0.15	9	0.17
Slovenia	Y	C	5	5	0.24	0.23	11	0.54	6	0.30	3	0.15	4	0.20
Spain	N	C	91	91	-	-	129	-	121	-	88	-	82	-
Sweden	Y	C	56	56	0.60	0.55	63	0.67	73	0.79	60	0.65	56	0.61
United Kingdom	Y	C	164	164	0.26	0.26	176	0.28	235	0.38	206	0.34	260	0.43
EU total	**-**	**-**	**1501**	**1493**	**0.31**	**0.29**	**1643**	**0.34**	**1675**	**0.35**	**1425**	**0.30**	**1581**	**0.34**
Iceland	Y	C	2	2	0.63	0.65	1	0.32	0	0.00	0	0.00	4	1.30
Liechtenstein	-	-	-	-	-	-	-	-	-	-	0	0.00	0	0.00
Norway	Y	C	21	21	0.43	0.47	22	0.45	31	0.65	34	0.72	49	1.05
Total	**-**	**-**	**1524**	**1516**	**0.31**	**0.30**	**1666**	**0.34**	**1706**	**0.35**	**1459**	**0.31**	**1634**	**0.35**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

Epidemiological situation in 2011

In 2011, 28 EU/EEA countries provided data on the disease. Lichtenstein and Portugal did not report any data. Overall, 1516 confirmed cases of listeriosis were reported, giving an overall case rate of 0.31 per 100 000 population (Table 2.3.13). The highest rates were observed in Denmark (0.88 per 100 000) followed by Finland with 0.80 per 100 000 inhabitants. Germany and France reported the highest number of confirmed cases, 330 and 282, respectively.

Among the 1516 confirmed cases, 1186 were reported as being autochthonous and 12 related to travel, while for 318 cases travel information was unknown. The trend has been rather stable with slight annual fluctuation due to seasonal peaks in the reporting of cases (Figure 2.3.32).

Age and gender distribution

Among the 1516 confirmed cases of listeriosis reported in 2011, 867 (57%) were over 65 years old, 362 (24%) cases were in the age group 45–64 years, 141 (9%) in the age group 25–44 years, 29 (2%) cases were in the age group 15–24 years, 14 (1%) cases in the age group 5–14 years and 92 (6%) in the age group 0–4 years (age unknown for 11 cases). With regard to gender distribution, 806 were males and 707 were females (no data on gender for three cases) giving a male-to-female ratio 1.1:1. There is a predominance of higher case rates for both genders aged over 65 years (Figure 2.3.33).

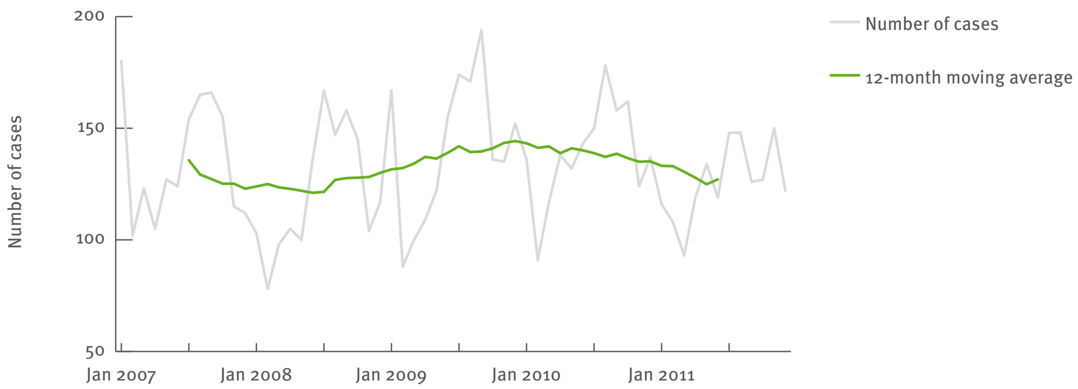
Seasonality

The seasonal trend for listeriosis in 2011 followed the same pattern as in previous years. The first peak in reported cases was noted in May, the second in August and the third in November (Figure 2.3.34).

Enhanced surveillance in 2011

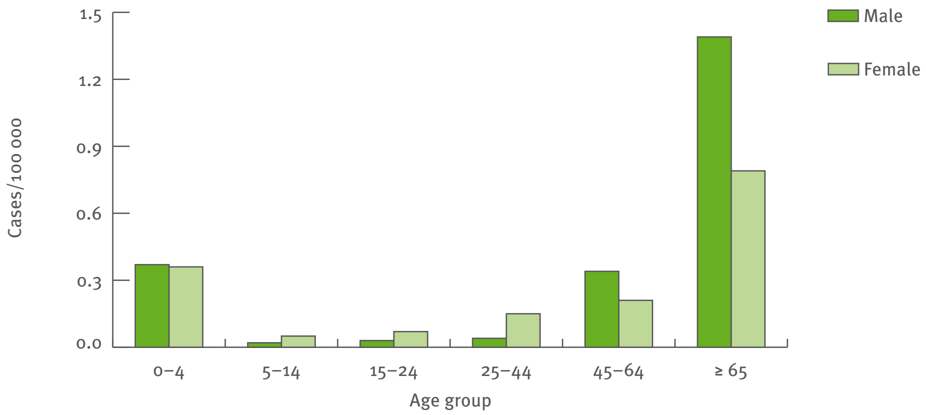
Data on hospitalisation for listeriosis have been collected as part of TESSy's case-based reporting for the last two years. Sixteen Member States provided this information for all or the majority of their cases, representing 43.7% of all confirmed cases reported in the EU in 2011. On average, 93.6 % of the cases were hospitalised and, in 10 Member States, this proportion

Figure 2.3.32. Trend and number of confirmed cases of listeriosis reported in the EU/EEA, 2007–2011



Source: Country reports from Austria, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Lithuania, Latvia, Malta, the Netherlands, Norway, Poland, Romania, Slovakia, Slovenia, Sweden and the United Kingdom.

Figure 2.3.33. Rates of confirmed listeriosis cases reported in the EU/EEA, by age and gender, 2011



Source: Country reports from Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, the Netherlands, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

was 100%. This is the highest hospitalisation rate of all zoonoses under EU surveillance and reflects the focus of surveillance on severe, systemic infections.

Discussion

Listeriosis is an uncommon but severe disease in Europe; elderly people, pregnant women and immunocompromised individuals are particularly susceptible. According to the data collected by TESSy, in 2011 all age groups were affected by the disease with a predominance of cases among persons over 65 years. Listeriosis is a severe disease and further efforts are needed to improve the timely linkage of comparable molecular typing data from human and food isolates[4].

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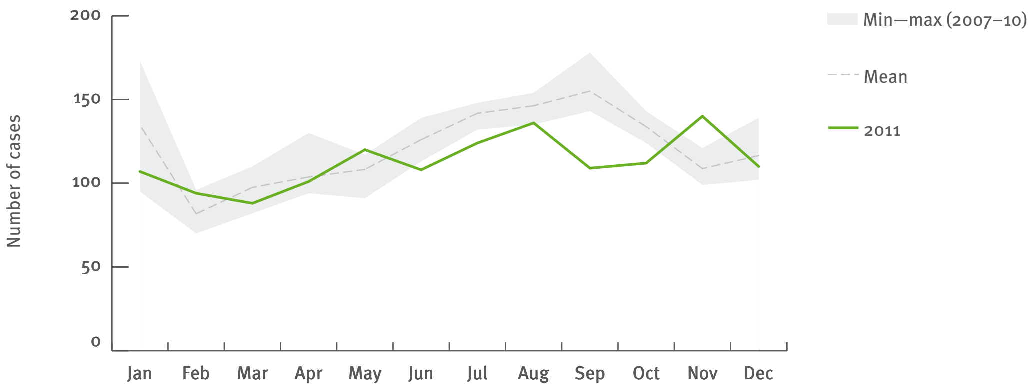
Figure 2.3.34. Seasonal distribution: Number of confirmed cases of listeriosis by month, EU/EEA, 2007–2011



Source: Country reports from Austria, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Lithuania, Latvia, Malta, the Netherlands, Norway, Poland, Romania, Slovakia, Slovenia, Sweden and the United Kingdom.

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by				National coverage	National reference laboratory data	Comparable data available	Case definition used
						Laboratories	Physicians	Hospitals	Others				
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Belgium	BE-LABNET	V	Se	A	C	Y	N	-	-	Y	-	-	Not specified/unknown
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	Y	-	-	EU-2008
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y	-	-	EU-2008
Denmark	DK-LAB	Cp	Co	P	C	Y	N	N	N	Y	-	-	Other
Estonia	EE-LISTERIOSIS	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2002
Finland	FI-NIDR	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
France	FR-MANDATORY_INFECTIOUS_DISEASES	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	Not specified/unknown
Germany	DE-SURVNET@RKI-7.1	Cp	Co	P	C	Y	N	N	Y	Y	-	-	Other
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Hungary	HU-Zoonoses	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Ireland	IE-CIDR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Italy	IT-NRS	Cp	Co	P	C	N	Y	Y	N	Y	-	-	Other
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU case definition (legacy/deprecated)
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	-	Y	N	N	Y	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Netherlands	NL-OSIRIS	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	Not specified/unknown
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	N	Y	Y	N	Y	-	-	EU-2008
Romania	RO-RNSSy	Cp	Co	P	C	Y	N	Y	N	Y	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y	-	-	EU-2008
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Spain	ES-MICROBIOLOGICAL	V	Se	P	C	Y	N	N	N	N	-	-	EU-2008
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
United Kingdom	UK-LISTERIOSIS	V	Co	A	C	Y	N	Y	Y	Y	-	-	Other

Salmonellosis

- Salmonellosis continues to be the second most commonly reported gastrointestinal infection and an important cause of foodborne outbreaks in the EU/EEA.
- In 2011, the confirmed case rate of salmonellosis was 20.4 cases per 100 000 population in the EU/EEA.
- Between 2007 and 2011, salmonellosis rates showed a significant five-year decreasing trend in the EU; this decrease is mainly attributed to the implementation of successful veterinary control programmes, particularly in poultry.
- The reported case rate is highest in young children: 94.8 cases per 100 000 population (2011), five times higher than in adults.
- In 2011, the five most commonly reported serotypes were *S.* Enteritidis, *S.* Typihimurium, monophasic *S.* Typhimurium, *S.* Infantis, and *S.* Newport.
- In 2012, four multinational foodborne *Salmonella* outbreaks were reported in the EU/EEA. The largest involved ten EU countries with almost 700 cases and was most likely related to turkey meat.

Infections by bacteria belonging to the genus *Salmonella* are one of the most common gastrointestinal illnesses reported in the EU/EEA. A range of wild and domesticated animals are reservoirs for *Salmonella* species, and humans are usually infected by ingesting contaminated, undercooked food. In addition to food, other transmission modes that have been linked to infections are travel, pet products and direct contact with live animals, including exotic pets. Outbreaks occur frequently and they often have a multinational scope due to cross-border travelling and food and animal trade.

Epidemiological situation in 2011

In 2011, 96 883 confirmed salmonellosis cases were reported by 29 EU/EEA countries (Table 2.3.14). The overall confirmed case rate was 20.4 per 100 000 population.

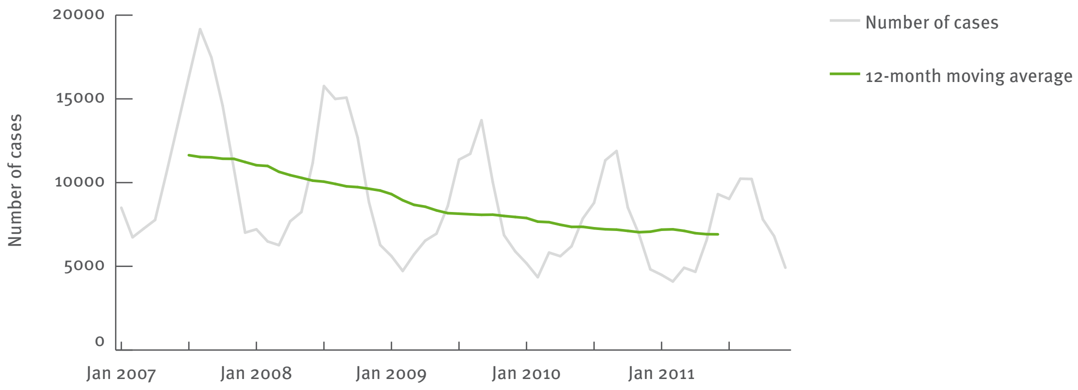
The highest confirmed case rates were reported in the Czech Republic (80.69 cases per 100 000 population), Slovakia (71.70) and Lithuania (70.70). Five countries reported fewer than 10 cases per 100 000 population: Greece, Ireland, Italy, Portugal and Romania.

Overall, reported case rates declined steadily between 2007 and 2011 (Figure 2.3.35). Ten EU countries had a statistically significant ($p < 0.001$) five-year decreasing trend in reported cases (Austria, Denmark, Finland, Germany, Greece, Italy, Portugal, Slovakia, Slovenia and Sweden)[1]. Only one country, France, had a significant increasing trend in salmonellosis cases. This could be explained by an increased proportion of *Salmonella* isolates from private laboratories sent to the National Reference Centre for Salmonella from 2008 and onwards and two very large outbreaks of the monophasic variant of *S.* Typhimurium[1,2].

Age and gender distribution

As in previous years, the age-specific confirmed case rate in 2011 was highest in young children, in particular in the 0–4-year-old age group: 94.8 per 100 000 population (Figure 2.3.36). The rate in young children was almost three times higher than in older children and more than five times higher than in the other age groups. There were no differences in the overall rates between males and females (male-female ratio 1.0:1.0).

Figure 2.3.35. Trend and number of confirmed cases of salmonellosis reported in the EU/EEA, 2007–2011



Source: Country reports from Austria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Norway, Portugal, Slovakia, Slovenia, Sweden and the United Kingdom.

Seasonality

There is a clear seasonal trend for reported salmonellosis cases (Figure 2.3.37), with rates increasing over the summer months, peaking in August and September, and then decreasing sharply. Compared to the previous four years however, the number of cases reported by month was generally lower in 2011, particularly in August and September.

Enhanced surveillance

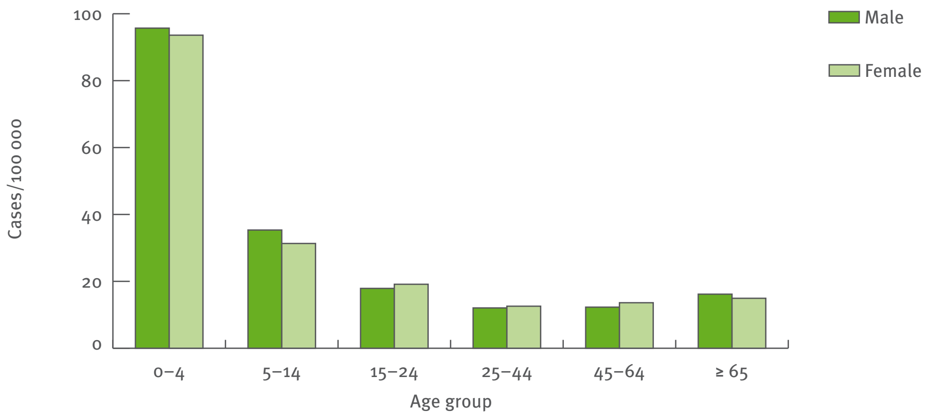
The two most common *Salmonella* serotypes in 2011 in the EU/EEA countries were *S.* Enteritidis and *S.* Typhimurium, accounting for 44% and 25% of all reported serotypes, respectively (Table 2.3.15). In 2011, the number of cases with *S.* Enteritidis decreased by 6% compared to 2010, while cases with *S.* Typhimurium decreased by 9%. Most of the decrease in *S.* Typhimurium could however be explained by the introduction of a separate code in TESSy for the reporting of monophasic *S.* Typhimurium 1,4,5,12:i:- in 2010. The significant increase in monophasic *S.* Typhimurium (157%) was therefore partly a result of harmonised reporting and partly due to two large foodborne outbreaks in France with 682 and 337 cases, respectively[2]. New on the list of most common serovars in 2011 was *S.* Poona, with 548 cases reported in 2011 (Table 2.3.15). A large proportion of these cases were from an outbreak involving *S.* Poona in infants in Spain due to contaminated milk formula[3].

Table 2.3.15. *Salmonella* serotypes most frequently reported from EU/EEA countries in 2011 and percentage change, 2010–2011

Serotype	2011	Change 2010–2011
S. Enteritidis	34 385	-6%
S. Typhimurium	19 250	-9%
S. Typhimurium, monophasic 1,4,5,12:i:-*	3 666	157%
S. Infantis	1 676	-7%
S. Newport	771	-8%
S. Derby	704	6%
S. Kentucky	559	-29%
S. Poona	548	135%
S. Virchow	467	-32%
S. Agona	459	3%

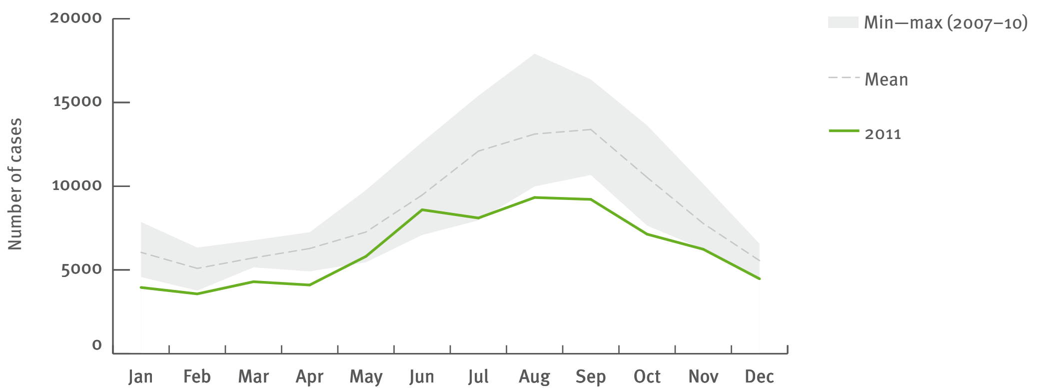
Source: Country reports from Austria, Belgium, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.
* A separate serotype code for *S.* Typhimurium, monophasic 1,4,5,12:i:- was introduced in 2010; ten countries reported cases with the new serotype code in 2011 compared with six in 2010.

Figure 2.3.36. Rates of confirmed salmonellosis cases reported in the EU/EEA, by age and gender, 2011



Source: Country reports from Austria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Norway, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Figure 2.3.37. Seasonal distribution: Number of confirmed cases of salmonellosis by month, EU/EEA, 2007–2011



Source: Country reports from Austria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Norway, Portugal, Slovakia, Slovenia, Sweden and the United Kingdom.

In 2011, the percentage of imported cases in the EU was 17% of all confirmed cases with known importation status (n=62 538). The percentage of imported cases was highest in the Nordic countries of Finland, Sweden and Norway (over 70%), between 45–60% in Denmark, Iceland, Ireland and the United Kingdom. In the remaining countries, *Salmonella* infections were mainly reported as domestically acquired. Of the imported cases, other EU/EEA countries were mentioned as the probable country of infection in 25% of cases where this information was available (n=13 386).

Updates from epidemic intelligence 2012

During 2012, *Salmonella* was the most common agent associated with the urgent inquiries (UIs) in the Epidemic Intelligence Information System for Food- and Waterborne Diseases (EPIS-FWD), a platform for information exchange between Member States (59%; for information on other UIs relating to *Salmonella* spp. see below). Four outbreaks, caused by *S.* Stanley, *S.* Thompson, *S.* Newport and monophasic *S.* Typhimurium phage type U323, were classified as multinational and affected several Member States.

Multi-country outbreak of non-travel-related *Salmonella* Stanley, 2011–2013

On 29 June 2012, the National Reference Centre for Salmonella in Belgium reported through the EPIS-FWD platform a significant increase in human cases of *Salmonella* Stanley infection compared to previous years. This marked the start of an EU-wide multi-country outbreak investigation of *S.* Stanley involving collaboration at local, regional and national level in the affected Member States and between ECDC, EFSA, the EU reference laboratory for *Salmonella* and the European Commission to identify the source and determine the appropriate control measures[4]. As of 23 January 2013, 684 cases of *S.* Stanley infections with no history of travel outside the EU had been identified in the EU since 1 August 2011. Ten countries had at least one case with the outbreak pattern, as indicated by using pulsed-field gel electrophoresis (PFGE): Hungary (235), Austria (186),

Table 2.3.14. Numbers and rates of confirmed salmonellosis cases reported in the EU/EEA, 2007–2011

Country	National coverage	Report type	Total cases	2011			2010		2009		2008		2007	
				Confirmed cases and notification rate per 100 000 population			Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Rate	Age-standardised rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	Y	C	2 010	1 433	17.05	17.56	2 179	26.02	2 775	33.21	2 312	27.79	3 386	40.88
Belgium	N	C	3 177	3 177	-	-	3 169	-	3 113	-	3 831	-	3 930	-
Bulgaria	Y	A	932	924	12.31	-	1 154	15.26	1 247	16.39	1 516	19.84	1 136	14.79
Cyprus	Y	C	110	110	13.10	12.82	136	16.60	134	16.82	169	21.41	158	20.29
Czech Republic	Y	C	8 641	8 499	80.69	82.73	8 209	78.13	10 480	100.12	10 707	103.14	17 655	171.62
Denmark	Y	C	1 170	1 170	21.04	20.74	1 608	29.05	2 130	38.65	3 669	67.00	1 648	30.26
Estonia	Y	C	385	375	27.98	28.48	381	28.43	261	19.47	647	48.25	428	31.88
Finland	Y	C	2 082	2 082	38.73	39.38	2 422	45.26	2 329	43.73	3 126	58.98	2 738	51.89
France	Y	C	8 685	8 685	13.35	12.50	7 184	11.10	7 153	11.12	7 186	11.23	5 313	8.35
Germany	Y	C	24 511	23 982	29.34	31.05	24 833	30.36	31 395	38.29	42 885	52.16	55 399	67.30
Greece	Y	C	472	469	4.15	4.29	297	2.63	403	3.58	792	7.06	706	6.32
Hungary	Y	C	6 446	6 169	61.78	64.42	5 953	59.45	5 873	58.55	6 637	66.07	6 578	65.35
Ireland	Y	C	311	311	6.94	6.46	349	7.81	335	7.53	447	10.16	440	10.20
Italy	Y	C	3 344	3 344	5.52	5.79	4 752	7.88	5 715	9.52	6 662	11.17	6 731	11.38
Latvia	Y	C	1 088	998	44.76	47.25	877	39.01	795	35.16	1 229	54.12	619	27.13
Lithuania	Y	C	2 294	2 294	70.70	71.57	1 962	58.94	2 063	61.58	3 308	98.27	2 270	67.06
Luxembourg	Y	C	125	125	24.42	23.69	211	42.03	162	32.83	153	31.63	163	34.23
Malta	Y	C	129	129	30.89	28.71	160	38.61	125	30.22	161	39.24	85	20.84
Netherlands	N	C	1 284	1 284	-	-	1 447	-	1 204	-	1 627	-	1 224	-
Poland	Y	A	8 813	8 400	21.99	-	9 257	24.25	8 529	22.37	9 149	24.00	11 155	29.26
Portugal	Y	C	174	174	1.64	1.73	205	1.93	220	2.07	332	3.13	438	4.13
Romania	Y	C	1 055	989	4.62	4.67	1 285	5.99	1 105	5.14	624	2.90	620	2.88
Slovakia	Y	C	4 131	3 897	71.70	72.95	4 942	91.10	4 182	77.27	6 849	126.81	8 367	155.13
Slovenia	Y	C	400	400	19.51	20.07	363	17.73	616	30.31	1 033	51.39	1 336	66.46
Spain	N	C	3 786	3 786	-	-	4 420	-	4 304	-	3 833	-	3 842	-
Sweden	Y	C	2 887	2 887	30.66	30.61	3 612	38.67	3 054	32.99	4 185	45.57	3 930	43.12
United Kingdom	Y	C	9 455	9 455	15.13	14.70	9 670	15.59	10 479	17.01	11 511	18.81	13 557	22.31
EU total	**-**	**-**	**97 897**	**95 548**	**20.36**	**19.83**	**101 037**	**21.51**	**110 181**	**23.81**	**134 580**	**29.46**	**153 852**	**34.17**
Iceland	Y	C	45	45	14.13	14.00	34	10.70	35	10.96	134	42.48	93	30.23
Liechtenstein	-	-	-	-	-	-	-	-	-	-	0	0.00	1	2.84
Norway	Y	C	1 290	1 290	26.22	25.98	1 370	28.20	1 235	25.73	1 941	40.97	1 649	35.23
Total	**-**	**-**	**99 232**	**96 883**	**20.42**	**19.88**	**102 441**	**21.58**	**111 451**	**23.82**	**136 655**	**29.59**	**155 595**	**34.18**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

Germany (77), the United Kingdom (England and Wales) (64), Belgium (41), the Czech Republic (35), Sweden (18), Italy (14), Slovakia (12), and Greece (1) (Figure 2.3.38)[5].

The standardised European questionnaire did not identify a significant common exposure for the EU's human cases, although investigations in Austria and Hungary suggested turkey meat was the source of infection. Indistinguishable 'fingerprints', determined by PFGE, were confirmed in several isolates from humans, turkeys, turkey meat and environment samples throughout the turkey food production chain, implicating turkeys and meat thereof as most likely multiple vehicles for infection. The joint ECDC risk assessment with EFSA recommended thorough trace-back and trace-forward investigations to understand and assess the outbreak's associated risks, identify its primary source and track its spread along the food chain in order to enable control measures to prevent further human cases. In January 2013, the case numbers of *S.* Stanley had returned to background levels, indicating that the outbreak was over.

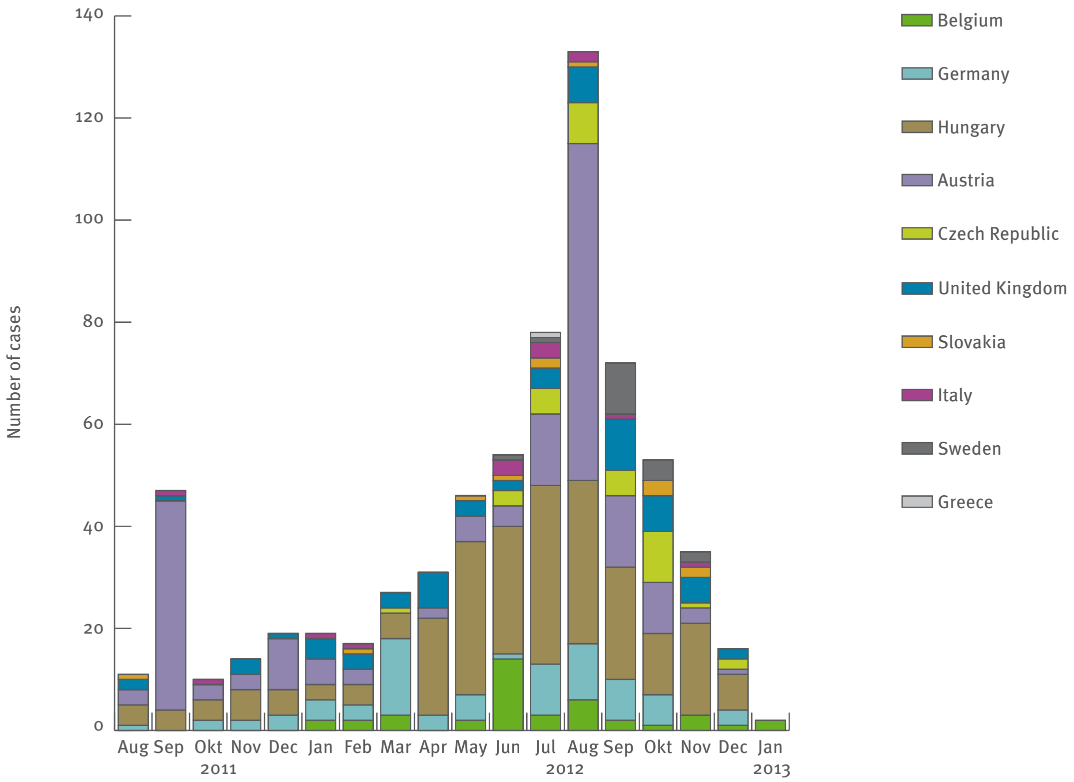
Salmonella Newport outbreak linked to watermelons

In January 2012, an outbreak of *Salmonella* Newport was reported through the EPIS-FWD platform. Germany reported the first cluster of 15 cases with a *S.* Newport PFGE pattern, matching that of an isolate from Brazilian watermelons, processed in the United Kingdom and notified through the Rapid Alert System for Food and Feed (RASFF)[6]. The cases were distributed across the country and ranged in age between five and 92 years. Disease onsets were between 24 November and 29 December 2011. Cases with indistinguishable PFGE pattern to that of the German cases and the watermelon isolate had also been identified in the United Kingdom (England and Wales 32 cases, Scotland four cases) and Ireland (four cases) primarily in December 2011.

Salmonella Thompson in smoked salmon

At the end of August 2012, the Netherlands reported an increase in the number of *Salmonella* Thompson cases reported to EPIS-FWD when 34 cases had been identified, most of them in the preceding weeks. A month later the case numbers had increased to 190. All cases had the same PFGE pattern and were spread across the country. There was a higher proportion of female cases than male and at the time the median age was 55 years (range=2–91). Through a matched case-control study the authorities were able to identify smoked salmon as the cause of the outbreak[6]. Trace-back studies identified a particular Dutch brand of smoked salmon as a suspected vehicle and subsequent investigations of salmon samples yielded positive *S.* Thompson findings with the indistinguishable PFGE pattern as in human cases. Recalls of the product were initiated but due to the lag between the date of onset and the reporting from the laboratories, high numbers of cases continued to be reported in the following weeks. When the outbreak was

Figure 2.3.38. Distribution of cases of non-travel-related *Salmonella* Stanley infections (probable and confirmed cases) by Member States and month of report, August 2011–January 2013, as of 23 January 2013 (n=684)



declared over there had been 1 149 cases reported and confirmed, with four fatal cases among older patients by 31 December 2012. The peak of the outbreak (looking at date of disease onset) was observed in the last week of September, which was when the recall started.

No other European country reported any cases linked to this outbreak. There were however two almost simultaneous outbreaks of *S.* Thompson in the United States (113 cases) and Canada (105 cases). The epidemiological investigation did not point to smoked salmon in either of these outbreaks, although the PFGE profile in the US cases was indistinguishable from that of the Dutch cases and the Canadian profile was very similar. The same brand of smoked salmon had been distributed to both of these countries.

Monophasic *Salmonella* Typhimurium phage type U323 from unknown source

In 2012, a number of countries reported case numbers above the levels expected for monophasic *Salmonella* Typhimurium phage type U323 to the EPIS-FWD platform. These included Ireland (16 cases), the United Kingdom (England and Wales 12 cases, and Scotland six non-travel related cases), Denmark (five cases) and Germany (32 cases). The majority of cases were reported in August and September and ranged in age from infants to the elderly; in Germany a third of the cases were children below five years of age. Most isolates had the same antimicrobial resistance pattern, PFGE-pattern and identical or similar pattern using multi-locus variable-number-tandem repeats analysis (MLVA). Considering the unusual phage type and similar strain characteristics, it was considered possible that the cases had the same source. However, none of the national epidemiological investigations could identify a suspected cause of this outbreak, and the vehicle and cause remained unidentified.

Discussion

The rate of salmonellosis reported in young children is more than five times as high as among adults. This may be due to the higher proportion of symptomatic infections among the young, as well as an increased likelihood of doctors taking samples from small children.

The steady decrease in reported human salmonellosis cases at the EU/EEA level continued in 2011. This statistically significant trend has been observed over the last five years[1]. The decrease is mostly attributed to the implementation of *Salmonella* control programmes in the poultry industry since 2007, particularly in laying hens and broilers. The continuous decline for the fifth consecutive year, especially in *S.* Enteritidis cases, supports this observation because this particular serotype is most often reported in poultry and eggs. Salmonellosis, however, continued to have a high confirmed case rate in EU/EEA countries (20.4 per 100 000 population). In 2011, salmonellosis was the second most commonly reported zoonoses in humans, following campylobacteriosis[1].

The number of *Salmonella* outbreaks in the EU has been decreasing since 2008[1], which is in line with the general decline in notified salmonellosis cases observed in EU countries. However, *Salmonella* is still the most important cause of foodborne outbreaks with known source in the EU and accounted for 27% of all outbreaks reported to EFSA and 59% of all outbreaks reported in EPIS FWD in 2011. Eggs and egg products accounted for half of the *Salmonella* outbreaks with strong evidence reported to EFSA[1].

Multinational *Salmonella* outbreaks continue to occur and the largest in 2011 involved ten EU countries with almost 700 human cases. This underlines the need to continue to improve early detection, coordinated investigation and implementation of the appropriate control measures across and within the Member States, at the European level, and between human, veterinary and food safety organisations and networks. It is necessary to rapidly detect dispersed multinational clusters as well as to investigate if and how the various *Salmonella* strains found in Member States (and worldwide) are related. It is therefore anticipated that the molecular surveillance of human *Salmonella* isolates set up at ECDC (starting with a pilot study in 2012) and later at EFSA for animal and food isolates, will significantly improve the detection of multinational outbreaks.

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Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by: Laboratories	Physicians	Hospitals	Others	National coverage	National reference laboratory data	Comparable data available	Case definition used
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Belgium	BE-REFLAB	V	Se	A	C	Y	N	N	N	Y	-	-	Not specified/unknown
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	Y	-	-	EU-2008
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y	-	-	EU-2008
Denmark	DK-LAB	Cp	Co	P	C	Y	N	N	N	Y	-	-	Other
Estonia	EE-SALMONELLOSIS	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Finland	FI-NIDR	Cp	Co	P	C	Y	N	N	N	Y	-	-	Not specified/unknown
France	FR-NATIONAL_REFERENCE_CENTRES	V	Co	P	C	Y	N	N	N	Y	-	-	Other
Germany	DE-SURVNET@RKI-7.1	Cp	Co	P	C	Y	N	N	Y	Y	-	-	Other
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Hungary	HU-Zoonoses	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Ireland	IE-CIDR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Italy	IT-NRS	Cp	Co	P	C	N	Y	Y	N	Y	-	-	Other
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU case definition (legacy/deprecated)
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Luxembourg	LU-LNS-Microbio	V	Co	P	C	Y	N	Y	N	Y	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Netherlands	NL-LSI	V	Co	P	C	Y	N	N	N	-	-	-	EU-2008
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	Not specified/unknown
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Portugal	PT-SALMONELLOSIS	Cp	Co	P	C	N	Y	N	N	Y	-	-	Other
Romania	RO-RNSSy	Cp	Co	P	C	Y	N	Y	N	Y	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	Y	Y	-	-	EU-2008
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Spain	ES-MICROBIOLOGICAL	V	Se	P	C	Y	N	N	N	N	-	-	EU-2008
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
United Kingdom	UK-SALMONELLOSIS	O	Co	P	C	Y	N	Y	Y	Y	-	-	Other

Shigellosis

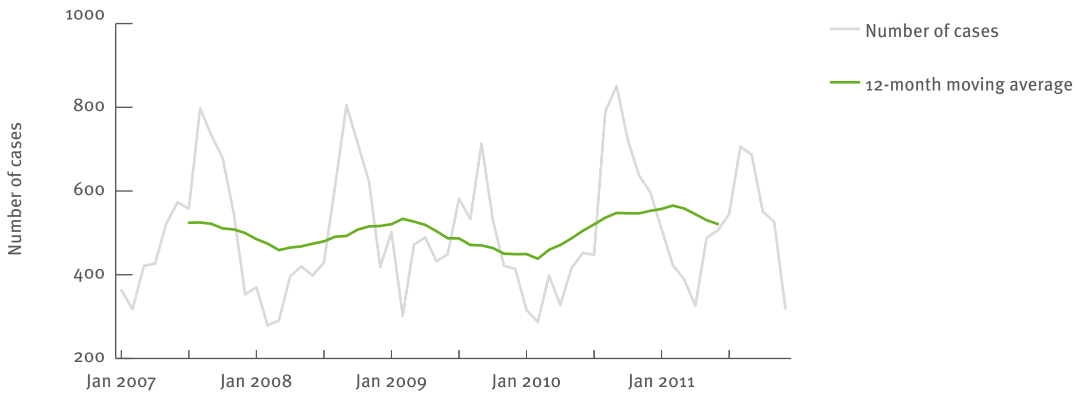
- In 2011, the confirmed case rate of shigellosis was 1.61 cases per 100 000 population in Europe.
- Shigellosis continues to be most prevalent in children under five years of age.
- There is a high proportion of travel-associated cases, predominantly related to travel outside of the EU/EEA.
- Among indigenous cases, the most common transmission modes reported in 2011 were contaminated food, sex and other person-to-person transmission.

Shigellosis, which is caused by bacteria of the genus *Shigella*, is a relatively uncommon infection in the EU. Infections may cause severe gastrointestinal illness potentially leading to death. Outbreaks may occur in crowded environments with poor sanitation. Humans are the only significant reservoir. Transmission occurs via the faecal-oral route, either through person-to-person contact, or through contaminated food or water.

Epidemiological situation in 2011

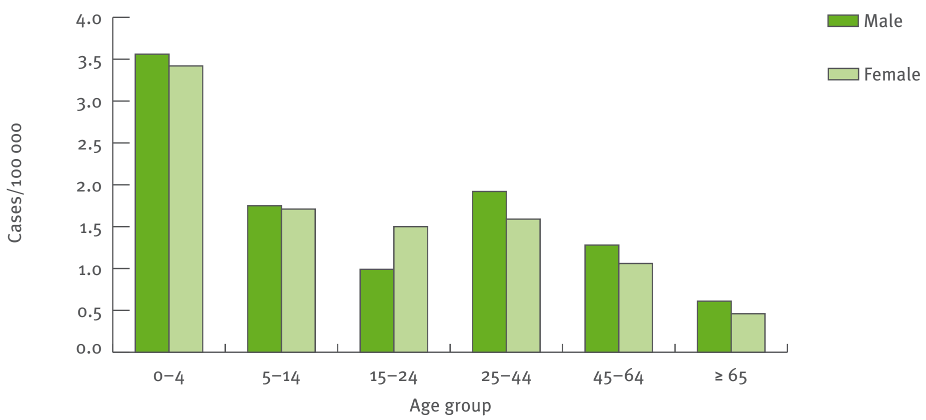
In 2011, 7 322 confirmed shigellosis cases were reported in 28 EU/EEA countries. Shigellosis remains a relatively uncommon infection; the overall EU/EEA confirmed case rate was 1.61 cases per 100 000 population in 2011.

Figure 2.3.39. Trend and number of confirmed cases of shigellosis reported in the EU/EEA, 2007–2011



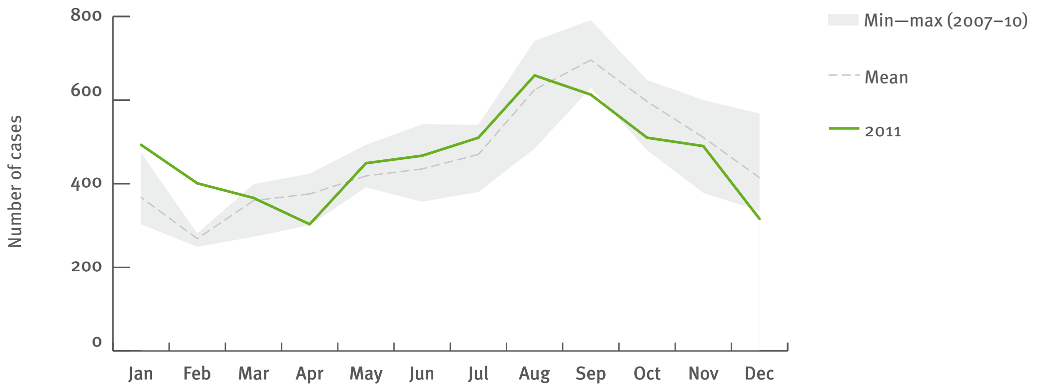
Source: Country reports from Austria, Cyprus, the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Malta, the Netherlands, Norway, Portugal, Slovakia, Slovenia, Sweden and the United Kingdom.

Figure 2.3.40. Rates of confirmed shigellosis cases reported in the EU/EEA, by age and gender, 2011



Source: Country reports from Austria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Figure 2.3.41. Seasonal distribution: Number of confirmed cases of shigellosis by month, EU/EEA, 2007–2011



Source: Country reports from Austria, Cyprus, the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Malta, the Netherlands, Norway, Portugal, Slovakia, Slovenia, Sweden and the United Kingdom.

Table 2.3.16. Numbers and rates of confirmed shigellosis cases reported in the EU/EEA, 2007–2011

Country	2011						2010		2009		2008		2007	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population			Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Rate	Age-standardised rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	Y	C	52	36	0.43	0.43	98	1.17	80	0.96	120	1.44	136	1.64
Belgium(a)	N	C	317	317	-	-	342	-	348	-	418	-	330	-
Bulgaria	Y	A	798	798	10.63	11.27	596	7.88	751	9.87	1094	14.32	1072	13.96
Cyprus	Y	C	2	2	0.24	0.27	0	0.00	2	0.25	1	0.13	0	0.00
Czech Republic	Y	C	164	157	1.49	1.53	387	3.68	177	1.69	227	2.19	331	3.22
Denmark	Y	C	91	91	1.64	1.66	91	1.64	106	1.92	90	1.64	-	-
Estonia	Y	C	22	22	1.64	1.69	46	3.43	52	3.88	69	5.15	114	8.49
Finland	Y	C	127	127	2.36	2.42	162	3.03	118	2.22	124	2.34	112	2.12
France	Y	C	641	641	0.99	0.98	774	1.20	1042	1.62	848	1.33	827	1.30
Germany	Y	C	679	664	0.81	0.85	697	0.85	617	0.75	575	0.70	867	1.05
Greece	Y	C	47	47	0.42	0.44	33	0.29	37	0.33	19	0.17	49	0.44
Hungary	Y	C	44	43	0.43	0.45	63	0.63	42	0.42	43	0.43	62	0.62
Ireland	Y	C	42	42	0.94	0.86	60	1.34	71	1.60	63	1.43	43	1.00
Italy	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Latvia	Y	C	10	10	0.45	0.44	11	0.49	36	1.59	91	4.01	73	3.20
Lithuania	Y	C	40	40	1.23	1.26	42	1.26	37	1.11	81	2.41	150	4.43
Luxembourg	Y	C	16	16	3.13	3.01	13	2.59	18	3.65	9	1.86	8	1.68
Malta	Y	C	4	4	0.96	0.99	2	0.48	1	0.24	3	0.73	0	0.00
Netherlands	Y	C	575	551	3.31	3.31	523	3.16	438	2.66	343	2.09	359	2.20
Poland	Y	A	17	17	0.05	0.04	24	0.06	21	0.06	31	0.08	53	0.14
Portugal	Y	C	3	3	0.03	0.03	6	0.06	3	0.03	7	0.07	12	0.11
Romania	Y	C	373	371	1.73	1.79	293	1.37	414	1.93	371	1.72	733	3.40
Slovakia	Y	C	600	536	9.86	9.95	370	6.82	370	6.84	446	8.26	525	9.73
Slovenia	Y	C	20	18	0.88	0.89	31	1.51	42	2.07	44	2.19	39	1.94
Spain(b)	Y	C	81	81	0.18	0.17	76	0.17	216	0.47	133	-	119	-
Sweden	Y	C	454	454	4.82	4.88	557	5.96	469	5.07	596	6.49	470	5.16
United Kingdom	Y	C	2070	2070	3.31	3.25	1881	3.03	1568	2.55	1595	2.61	1746	2.87
EU total	-	-	**7289**	**7158**	**1.59**	**1.58**	**7178**	**1.59**	**7076**	**1.57**	**7441**	**1.80**	**8230**	**2.07**
Iceland	Y	C	1	1	0.31	0.33	2	0.63	2	0.63	3	0.95	2	0.65
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	163	163	3.31	3.35	132	2.72	153	3.19	134	2.83	148	3.16
Total	-	-	**7453**	**7322**	**1.61**	**1.60**	**7312**	**1.60**	**7231**	**1.59**	**7578**	**1.82**	**8380**	**2.08**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.
(a) Sentinel surveillance system. (b) Surveillance system changed to full national coverage in 2009; earlier data covered only an estimated 25% of the population.

The number of cases reported at the EU/EEA level has remained stable during the period 2008–2011 (Table 2.3.16, Figure 2.3.39) even though both decreasing and increasing trends could be observed in individual Member States.

Bulgaria reported the highest confirmed case rate with 10.63 cases per 100 000 population, followed by Slovakia with 9.86, and Sweden with 4.82 cases per 100 000 population (Table 2.3.16).

Age and gender distribution

As in previous years, the highest confirmed case rate in the EU/EEA was among children under five years, with on average 5.1 cases per 100 000 population. Bulgaria and Slovakia reported the highest rates (109 and 94 cases per 100 000 population, respectively) in this age group. Shigellosis cases in the other age groups were substantially lower, ranging from 0.64 cases per 100 000 population in people aged 65 years and older to 2.1 among 5–14 year olds (Figure 2.3.40). However, in ten countries the highest rates of confirmed cases were observed in the 25–44-year age group.

There was a slightly higher rate of confirmed cases reported in men (1.7 cases per 100 000 population) than in women (1.5 cases per 100 000) with a male-to-female ratio of 1.13:1 (Figure 2.3.40).

Seasonality

Shigellosis cases in the EU/EEA normally follow a seasonal pattern, with most cases reported in late summer/early autumn. In 2011, the dominant peak was observed in August and a smaller peak was observed in January (Figure 2.3.41).

Enhanced surveillance

Twenty countries provided information on travel association for 3 197 (44%) cases. Of those, 1 999 (62%) were reported as imported (acquired in a country other than the reporting country), compared with 1 198 domestic infections (38%). The highest proportion of travel-associated cases was reported in January (79%). While in some countries the majority of cases are reported as travel-associated (e.g. Finland and Sweden), other countries report that most of their cases were domestically acquired (e.g. Greece and Hungary) (Table 2.3.17). Travel-associated cases were more common among adults (66%) than in children (43% in <15-year-olds).

The most probable country of infection was reported for 1 909 of the imported cases and 96% of these were associated with travel to non-EU/EEA countries. The highest number of cases was linked to travel to Egypt (445) and India (371).

Six countries reported transmission modes for part of their cases in 2011. The most common transmission modes for domestic cases were food (37%), sex (32%) and person-to-person transmission (26%), however information on transmission mode was provided for only 182 (15%) of all reported domestic cases.

Species information was provided for 4 584 confirmed cases (63%). Among these, the most common species were *S. sonnei* (61%) and *S. flexneri* (32%), but *S. boydii* (5%) and *S. dysenteriae* (3%) were also reported. Serotype information was provided for 700 of the 1 450 *S. flexneri* cases (*S. sonnei* does not have any serotypes). The most common *S. flexneri* serotypes were 2a (29%), 3a (15%), 6 (15%) and 1b (13%).

Table 2.3.17. Proportion of confirmed cases of shigellosis reported in the EU/EEA, 2011, based on origin of infection (travel-associated/domestic)

Country	Travel-associated (%)	Domestic (%)	Unknown (%)	Total (n)
Belgium	0	0	100.0	317
Bulgaria	0	0	100.0	798
Cyprus	0	100.0	0	2
Czech Republic	0	0	100.0	157
Denmark	65.9	34.1	0	91
Estonia	59.1	40.9	0	22
Finland	93.7	1.6	4.7	127
France	31.0	5.8	63.2	641
Germany	50.5	49.5	0	664
Greece	2.1	97.9	0	47
Hungary	14.0	86.0	0	43
Ireland	59.5	23.8	16.7	42
Italy	-	-	-	-
Latvia	0.0	100.0	0	10
Lithuania	22.5	77.5	0	40
Luxembourg	0	0	100.0	16
Malta	50.0	50.0	0	4
Netherlands	69.1	29.4	1.5	551
Poland	17.6	82.4	0	17
Portugal	0	0	100.0	3
Romania	0	0	100.0	371
Slovakia	0	0	100.0	536
Slovenia	16.7	0	83.3	18
Spain	0	0	100.0	81
Sweden	80.8	18.7	0	454
United Kingdom	17.8	15.1	67.1	2 070
EU total	**26.7**	**15.8**	**57.5**	**7 158**
Iceland	100.0	0	0	1
Liechtenstein	-	-	-	-
Norway	52.8	40.5	6.7	163
Total	**27.3**	**16.4**	**56.3**	**7 322**

Discussion

As in previous years, the highest confirmed case rate occurred in children under five years of age. Around 60% of cases were infected while travelling, predominantly to countries outside of the EU/EEA. An increase in travel during the winter holidays was also reflected as a small peak in cases during January.

Almost 40% of shigellosis cases were however indigenous and linked to consumption of contaminated food, sex and person-to-person transmission. Sexual transmission of shigellosis, particularly among men who have sex with men[1], is becoming more common in developed countries as transmission resulting from poor hygiene and sanitation is decreasing.

In 2011, five foodborne outbreaks due to *Shigella* spp. were reported in the EU/EEA[2]. These accounted for a total of 184 cases, 19 of which were hospitalised. The outbreaks were linked to buffet meals and one specific case was due to imported fresh basil used in pesto[3].

References

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Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by				National coverage	National reference laboratory data	Comparable data available	Case definition used
						Laboratories	Physicians	Hospitals	Others				
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Belgium	BE-REFLAB	V	Se	A	C	Y	N	N	N	Y	-	-	Not specified/unknown
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	Y	-	-	EU-2002
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y	-	-	EU-2008
Denmark	DK-MIS	Cp	Co	P	C	N	Y	N	N	Y	-	-	Other
Estonia	EE-PERTUSSIS/SHIGELLOSIS/SYPHILIS	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Finland	FI-NIDR	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
France	FR-NATIONAL_REFERENCE_CENTRES	V	Co	P	C	Y	N	N	N	Y	-	-	Other
Germany	DE-SURVNET@RKI-7.1	Cp	Co	P	C	Y	N	N	Y	Y	-	-	Other
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Hungary	HU-EFRIR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Ireland	IE-CIDR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	-	Y	N	N	Y	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Netherlands	NL-OSIRIS	Cp	Co	P	C	Y	Y	N	Y	Y	-	-	EU-2008
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	Not specified/unknown
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Portugal	PT-SHIGELLOSIS	Cp	Co	P	C	N	Y	N	N	Y	-	-	Other
Romania	RO-RNSSy	Cp	Co	P	C	Y	N	Y	N	Y	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	Y	Y	-	-	EU-2008
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Spain	ES-STATUTORY_DISEASES	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
United Kingdom	UK-SHIGELLOSIS	O	Co	P	C	Y	N	Y	Y	Y	-	-	Other

Toxoplasmosis (congenital)

- Congenital toxoplasmosis is an uncommon disease in the EU/EEA. At the time of writing, 29 cases had been reported for 2011 by 19 EU countries.
- The surveillance of toxoplasmosis is very heterogeneous in EU/EEA countries, making it impossible to estimate the burden of congenital toxoplasmosis in Europe, therefore any comparison of rates between countries should be made with caution.

Toxoplasmosis is an infection with the protozoan parasite *Toxoplasma gondii*. Cats are the primary host for the parasite, and humans are infected by ingestion of the oocysts. Toxoplasmosis is mild or without symptoms for most individuals, but infection in early pregnancy can result in stillbirth or congenital brain lesions (or lesions in other organs), particularly if the mother acquired her primary infection during the first trimester of pregnancy. Due to the change in the EU case definition for toxoplasmosis in 2008, since 2009 only congenital cases have had to be reported. This section therefore only reports data from cases below one year of age.

Epidemiological situation in 2011

In 2011, 29 confirmed congenital toxoplasmosis cases were reported by 19 EU Member States. This represents only a tenth of the number of cases reported in 2010

Table 2.3.18. Numbers and rates of confirmed congenital toxoplasmosis cases reported in the EU/EEA, 2007–2011

Country	2011					2010		2009		2008		2007	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	Y	C	0	0	0.00	1	1.32	1	1.30	0	0.00	1	1.29
Belgium	-	-	-	-	-	-	-	-	-	-	-	-	-
Bulgaria	Y	C	0	0	0.00	0	0.00	17	23.01	64	89.52	113	160.19
Cyprus	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Czech Republic	Y	C	2	2	1.70	2	1.69	2	1.67	2	1.75	1	0.95
Denmark	-	-	-	-	-	-	-	-	-	-	-	-	-
Estonia	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Finland	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	1	1.70
France[1]	-	-	-	-	-	244	29.75	266	33.32	-	-	-	-
Germany	Y	C	14	14	2.06	14	2.11	-	-	-	-	-	-
Greece	-	-	-	-	-	-	-	-	-	-	-	-	-
Hungary	Y	C	0	0	0.00	1	1.05	3	3.09	1	1.04	0	0.00
Ireland	Y	C	1	1	1.33	1	1.36	0	0.00	2	2.84	2	3.11
Italy	-	-	-	-	-	-	-	-	-	-	-	-	-
Latvia	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Lithuania	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Luxembourg	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Malta	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Netherlands	-	-	-	-	-	-	-	-	-	-	-	-	-
Poland	Y	A	4	4	0.97	7	1.68	3	0.73	8	2.07	8	2.15
Portugal	-	-	-	-	-	-	-	-	-	-	-	-	-
Romania	Y	C	0	0	0.00	0	0.00	2	0.91	0	0.00	0	0.00
Slovakia	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	2	3.73
Slovenia	Y	C	0	0	0.00	0	0.00	1	4.57	0	0.00	2	10.46
Spain	N	C	1	1	-	0	-	1	-	1	-	0	-
Sweden	-	-	-	-	-	-	-	-	-	-	-	-	-
United Kingdom	Y	C	7	7	0.87	9	1.14	10	1.27	5	0.65	3	0.40
EU total	**-**	**-**	**29**	**29**	**1.01**	**279**	**7.77**	**306**	**10.55**	**83**	**4.06**	**133**	**6.76**
Iceland	-	-	-	-	-	-	-	-	-	0	0.00	0	0.00
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	**-**	**-**	**29**	**29**	**1.01**	**279**	**7.77**	**306**	**10.55**	**83**	**4.05**	**133**	**6.74**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.
[1] Data from 2011 not available at the time of this report.

as France, accounting for 87% of the reported cases in 2010, did not have their surveillance data available at the time of this report. Only six countries reported any cases and thirteen countries reported zero cases (Table 2.3.18). The overall EU confirmed case rate was 1.01 per 100 000 under one-year-olds.

Discussion

Infection with *Toxoplasma* during pregnancy can result in very severe outcomes. Providing targeted information for pregnant women at risk of toxoplasmosis infection is therefore crucial to avoid severe complications in the foetus. As the prevalence of *Toxoplasma* infection in women of child-bearing ages has decreased in the last 30 years[1], more women are today susceptible to the infection. The importance of some transmission modes should also be better investigated, such as waterborne transmission, which has recently been increasingly reported in outbreaks and in endemic areas[2,3].

The usefulness of surveillance for toxoplasmosis is however debated because the disease is often asymptomatic and the effect of prenatal treatment for congenital toxoplasmosis is uncertain[4,5]. The surveillance of the disease differs in European countries, making it difficult to compare disease rates. Several countries have no surveillance of the disease, some focus on severe cases in all ages, and a few have surveillance targeted at congenital toxoplasmosis[4,6]. An example of the latter is the French surveillance system, which includes the screening of pregnant women (with follow-up during pregnancy of those that are not immune in order to detect seroconversion) and laboratory reporting of congenital toxoplasmosis cases detected during this process[7]. This systematic surveillance probably explains why France has reported the highest rate of congenital toxoplasmosis among EU countries.

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Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by				National coverage	National reference laboratory data	Comparable data available	Case definition used
						Laboratories	Physicians	Hospitals	Others				
Austria	AT-Reflab	V	O	P	C	Y	N	N	N	Y	-	-	EU-2008
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	Y	-	-	EU-2002
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y	-	-	EU-2008
Estonia	EE-TOXOPLASMOSIS	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Finland	FI-NIDR	Cp	Co	P	C	Y	N	N	N	Y	-	-	Not specified/unknown
Germany	DE-SURVNET@RKI-7.1	Cp	Co	P	C	Y	N	N	Y	-	-	-	Other
Hungary	HU-Zoonoses	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Ireland	IE-CIDR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	N	Y	Y	N	Y	-	-	EU-2008
Romania	RO-RNSSy	Cp	Co	P	C	Y	N	Y	N	Y	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y	-	-	EU-2008
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Spain	ES-MICROBIOLOGICAL	V	Se	P	C	Y	N	N	N	N	-	-	EU-2008
United Kingdom	UK-TOXOPLASMOSIS	V	Co	P	C	Y	N	Y	Y	Y	-	-	Other

Trichinellosis

- Trichinellosis remains an uncommon disease in EU and EEA countries
- In 2011, the confirmed case rate of trichinellosis was 0.06 cases per 100 000 population (268 confirmed cases), which is comparable to 2010 and substantially lower than in 2007–2009
- In 2011, most cases were reported from Romania and Latvia.

Trichinellosis is a disease caused by an infection with the intestinal nematode parasite *Trichinella*, most commonly the species *T. spiralis*. A wide range of animals act as hosts, such as pigs (including wild boar), dogs, cats and horses. Infection in humans occurs by ingesting larvae-containing meat or blood from infected animals. Infection in humans is uncommon in the EU due to effective meat inspection control, but occurs in some countries, mostly associated with the consumption of wild boar meat.

Epidemiological situation in 2011

In 2011, 27 of the 30 EU/EEA countries reported on human trichinellosis and there were a total of 363 cases. In 13 countries there were zero cases reported (Table 2.3.19). Of these, 268 cases were confirmed, which is 20.2% more than in 2010. The overall confirmed case rate in 2011 was 0.06 cases per 100 000, very similar to that

Table 2.3.19. Numbers and rates of confirmed trichinellosis cases reported in the EU/EEA, 2007–2011

Country	2011						2010		2009		2008		2007	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population			Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Rate	Age-standardised rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	Y	C	1	1	0.01	0.01	5	0.06	0	0.00	0	0.00	0	0.00
Belgium	N	A	3	0	-	-	3	-	0	0.00	5	-	3	-
Bulgaria	Y	A	27	27	0.36	0.38	14	0.19	407	5.35	67	0.88	62	0.81
Cyprus	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Czech Republic	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Denmark	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Estonia	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Finland	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
France	Y	C	2	2	0.00	0.00	0	0.00	9	0.01	3	0.01	1	0.00
Germany	Y	C	3	3	0.00	0.00	3	0.00	1	0.00	1	0.00	10	0.01
Greece	Y	C	0	0	0.00	0.00	4	0.04	2	0.02	0	0.00	0	0.00
Hungary	Y	C	0	0	0.00	0.00	0	0.00	9	0.09	5	0.05	2	0.02
Ireland	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	2	0.05
Italy	Y	C	6	6	0.01	0.01	0	0.00	1	0.00	0	0.00	1	0.00
Latvia	Y	C	52	50	2.24	2.26	9	0.40	9	0.40	4	0.18	4	0.18
Lithuania	Y	C	51	29	0.89	0.89	77	2.31	20	0.60	31	0.92	8	0.24
Luxembourg	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Malta	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Netherlands	Y	C	1	1	0.01	0.01	0	0.00	1	0.01	1	0.01	0	0.00
Poland	Y	C	23	10	0.03	0.03	14	0.04	18	0.05	4	0.01	217	0.57
Portugal	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Romania	Y	C	162	107	0.50	0.49	82	0.38	265	1.23	503	2.34	432	2.00
Slovakia	Y	C	13	13	0.24	0.24	2	0.04	0	0.00	18	0.33	8	0.15
Slovenia	Y	C	1	1	0.05	0.04	0	0.00	1	0.05	1	0.05	0	0.00
Spain	Y	C	18	18	0.04	0.04	10	0.02	7	0.02	27	0.06	36	0.08
Sweden	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	1	0.01
United Kingdom	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
EU total	-	-	**363**	**268**	**0.06**	**0.06**	**223**	**0.05**	**750**	**0.15**	**670**	**0.14**	**787**	**0.16**
Iceland	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	-	-	**363**	**268**	**0.06**	**0.06**	**223**	**0.05**	**750**	**0.15**	**670**	**0.14**	**787**	**0.16**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

observed in 2010 and notably lower than in 2007–2009. This sustained decrease in case rate since 2009 (Figure 2.3.42) is mainly a result of significantly lower case numbers being reported from Bulgaria and Romania.

Eight countries reported more confirmed cases in 2011 than in 2010. Latvia accounted for the largest increase in cases from 2010 to 2011 (going from 9 to 50) and the highest case rate in 2011 (2.24 cases per 100 000). Lithuania observed the largest decrease in confirmed cases over the last year, reporting 77 in 2010 and 29 in 2011. Seventeen food-borne outbreaks from seven Member States were reported in 2011[1].

Age and gender distribution

The highest confirmed case rates were reported among young and middle-aged adults, with the most significant rate in females aged 25–44 years (0.086 cases per 100 000) followed by men aged 15–24 years (0.083 cases per 100 000) (Figure 2.3.43).

Seasonality

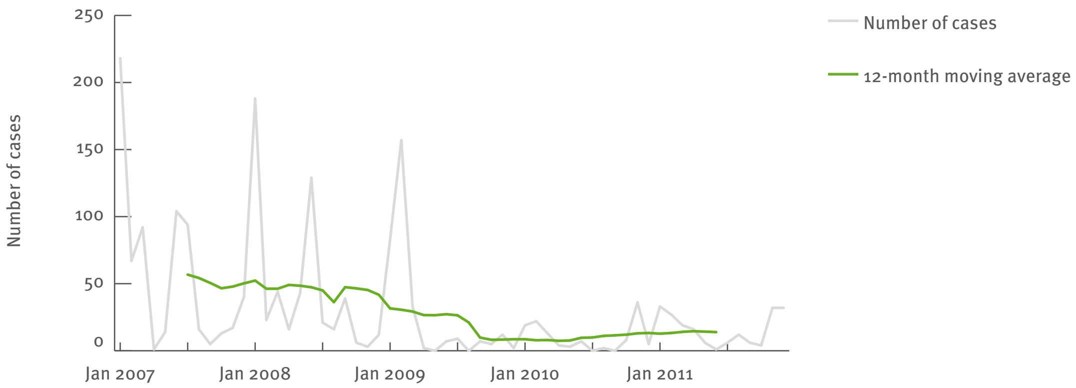
In previous years a clear winter peak could be observed each January–February, followed by a smaller peak in June. This trend was less evident in 2011 where peaks were observed in January and April (data from Bulgaria could not be included in the graph due to the Bulgarian reporting format) (Figure 2.3.44).

Discussion

Trichinellosis is an uncommon but serious human disease that is still present in the EU, with most cases reported from only a few Member States. During 2010 and 2011, the notification rate observed at the EU level was comparable, although Romania continued to report significantly higher case numbers than other countries. While the number of confirmed cases of human trichinellosis infection has decreased markedly in Romania since 2009, it continues to be a significant issue, accounting for 39.9 % of all confirmed cases in the EU in 2011, and 51.4 % of all confirmed cases since 2007.

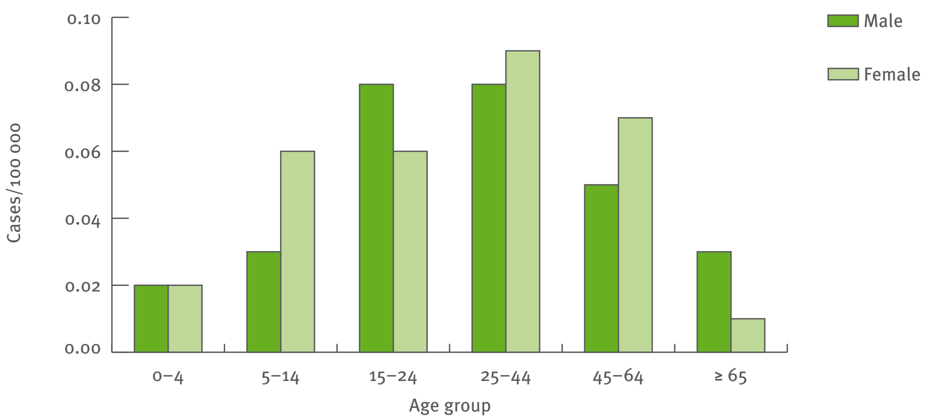
Of the seventeen trichinellosis outbreaks reported by seven Member States in 2011, five were linked to the consumption of pig and wild-boar meat, and/or derivative products[1]. Pig and wild boar meat and derivative products remain the two most important sources of human trichinellosis infection in the EU. Raising pigs in backyards poses a risk of infection and most positive findings in pigs come from such non-controlled domestic settings. There is no sign of a decreasing trend of *Trichinella* in wildlife so it is vital to continue educating

Figure 2.3.42. Trend and number of confirmed cases of trichinellosis reported in the EU/EEA, 2007–2011



Source: Country reports from Austria, Cyprus, the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Sweden and the United Kingdom.

Figure 2.3.43. Rates of confirmed trichinellosis cases reported in the EU/EEA, by age and gender, 2011



Source: Country reports from Austria, Bulgaria, France, Germany, Italy, Latvia, Lithuania, Luxembourg, Poland, Romania, Slovakia, Slovenia and Spain.

hunters on the risks of eating undercooked boar meat. Changes in current practices, such as the performing of mandatory post-slaughter inspection, could help reduce trichinellosis incidence[2].

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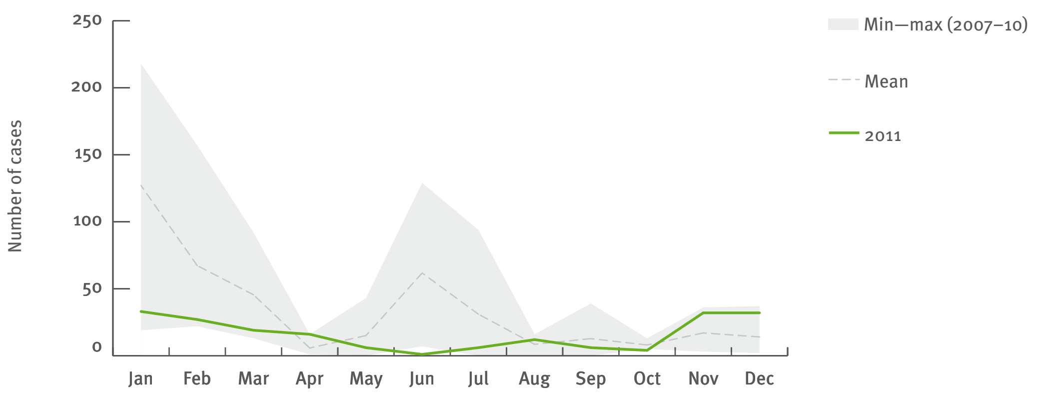
Figure 2.3.44. Seasonal distribution: Number of confirmed cases of trichinellosis by month, EU/EEA, 2007–2011



Source: Country reports from Austria, Bulgaria, Cyprus, the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Sweden and the United Kingdom.

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by				National coverage	National reference laboratory data	Comparable data available	Case definition used
						Laboratories	Physicians	Hospitals	Others				
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Belgium	BE-REFLAB	V	Se	A	C	Y	N	N	N	Y	-	-	Not specified/unknown
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	Y	-	-	EU-2002
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y	-	-	EU-2008
Estonia	EE-ANTH/CHOL/DIPH/MALA/SPOX/TRIC/TULA/TYPH	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Finland	FI-NIDR	Cp	Co	P	C	Y	N	N	N	Y	-	-	Not specified/unknown
France	FR-NATIONAL_REFERENCE_CENTRES	V	Co	P	C	Y	N	N	N	Y	-	-	Other
Germany	DE-SURVNET@RKI-7.1	Cp	Co	P	C	Y	N	N	Y	Y	-	-	Other
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Hungary	HU-Zoonoses	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Ireland	IE-CIDR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Italy	IT-NRS	Cp	Co	P	C	N	Y	Y	N	Y	-	-	Other
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Netherlands	NL-OSIRIS	Cp	Co	P	C	Y	Y	N	Y	Y	-	-	EU-2008
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	Not specified/unknown
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	N	Y	Y	N	Y	-	-	EU-2008
Portugal	PT-TRICHINOSIS	Cp	Co	P	C	N	Y	N	N	Y	N	1987	Other
Romania	RO-RNSSy	Cp	Co	P	C	Y	N	Y	N	Y	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y	-	-	EU-2008
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Spain	ES-STATUTORY_DISEASES	Cp	Co	P	C	N	Y	Y	N	Y	-	-	EU-2008
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
United Kingdom	UK-TRICHINOSIS	V	Co	P	C	Y	N	Y	Y	Y	Y	-	EU case definition (legacy/deprecated)

Tularaemia

- Tularaemia is an uncommon disease in the EU and EEA countries.
- The confirmed case rate (0.15 per 100 000) of tularaemia has decreased in 2011.
- The highest case rates were reported among elderly men.
- Sweden accounted for more than half of the reported cases in EU/EEA countries in 2011.

Tularaemia is a disease caused by infection with the bacterium *Francisella tularensis*. It is a relatively uncommon disease in EU/EEA countries. Many wild animals host the bacterium, and transmission to humans occurs usually through a bite of an infected tick or mosquito, but also through direct contact with infected animals, inhalation of contaminated dust, or ingesting contaminated water. Tularaemia is presented with an abrupt onset of symptoms, which consists of high fever, chills, headache, cough, generalised myalgia and vomiting. The disease can occasionally be fatal if untreated, but this is rare in Europe where patients have access to effective antibiotic treatment.

Epidemiological situation in 2011

In 2011, 26 EU and EEA countries provided data on tularaemia; Denmark, the Netherlands, Portugal and Liechtenstein did not report any cases. Overall, 724

Table 2.3.20. Number and rates of confirmed tularaemia cases reported in EU/EEA countries, 2007–2011

Country	2011						2010		2009		2008		2007	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population			Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Rate	Age-standardised rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	Y	C	4	0	0.00	0.05	3	0.04	2	0.02	8	0.10	4	0.05
Belgium	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	-	-
Bulgaria	Y	C	0	0	0.00	0.00	3	0.04	7	0.09	3	0.04	3	0.04
Cyprus	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Czech Republic	Y	C	57	57	0.54	0.54	50	0.48	64	0.61	109	1.05	51	0.50
Denmark	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Estonia	Y	C	2	2	0.15	0.15	-	-	-	-	1	0.08	2	0.15
Finland	Y	C	75	75	1.40	1.37	91	1.70	405	7.60	116	2.19	403	7.64
France	Y	C	43	16	0.03	0.03	22	0.03	16	0.03	104	0.16	48	0.08
Germany	Y	C	17	17	0.02	0.02	31	0.04	10	0.01	15	0.02	20	0.02
Greece	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Hungary	Y	C	15	15	0.15	0.15	126	1.28	38	0.39	25	0.25	20	0.20
Ireland	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Italy	Y	C	0	0	0.00	0.00	1	0.00	2	0.00	43	0.07	0	0.00
Latvia	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Lithuania	Y	C	0	0	0.00	0.00	1	0.03	1	0.03	2	0.06	1	0.03
Luxembourg	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Malta	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Netherlands	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Poland	Y	C	6	6	0.02	0.02	4	0.01	1	0.00	0	0.00	1	0.00
Portugal	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Romania	Y	C	0	0	0.00	0.00	4	0.02	0	0.00	0	0.00	0	0.00
Slovakia	Y	C	5	5	0.09	0.09	17	0.31	22	0.41	25	0.46	11	0.20
Slovenia	Y	C	0	0	0.00	0.00	0	0.00	1	0.05	2	0.10	1	0.05
Spain	Y	C	1	1	0.00	0.00	1	0.00	12	0.03	58	0.13	493	1.11
Sweden	Y	C	350	350	3.72	3.71	484	5.18	244	2.64	382	4.16	174	1.91
United Kingdom	Y	C	0	0	0.00	0.00	1	0.00	0	0.00	0	0.00	0	0.00
EU Total	**-**	**-**	**575**	**544**	**0.12**	**0.12**	**839**	**0.18**	**825**	**0.18**	**893**	**0.19**	**1232**	**0.27**
Iceland	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	-	-
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	180	180	3.66	3.69	33	0.68	13	0.27	66	1.39	49	1.05
EU/EEA Total	**-**	**-**	**755**	**724**	**0.15**	**0.15**	**872**	**0.19**	**838**	**0.18**	**959**	**0.20**	**1281**	**0.28**

confirmed cases of tularaemia were reported, giving an overall rate of 0.15 cases per 100 000. Sweden reported the highest case rate (3.72 per 100 000 population), followed by Finland (1.40) and the Czech Republic (0.54). Sweden reported the highest number of confirmed cases (n=350).

Age and gender distribution

For cases with known data, there was a higher proportion of males (n=352) than females (n=196), giving a male-to-female ratio of 1.8:1 (Figure 2.3.46). Four cases belonged to the age group 0–4 years, 31 to the age group 5–14 years, 30 to the age group 15–24 years, 135 were in the age group 25–44 years, 229 cases were in the age group 45–64 years, and 119 were over 65 years of age.

As in previous years, the highest confirmed case rates were observed in the oldest age groups and among men: 193 cases (0.31 per 100 000) were reported in 45–64-year-old men and 103 (0.30 per 100 000) cases in men were over 65 years of age. By comparison, 112 cases (0.10 per 100 000) were in females in the 45–64-year-old age group (Figure 2.3.46).

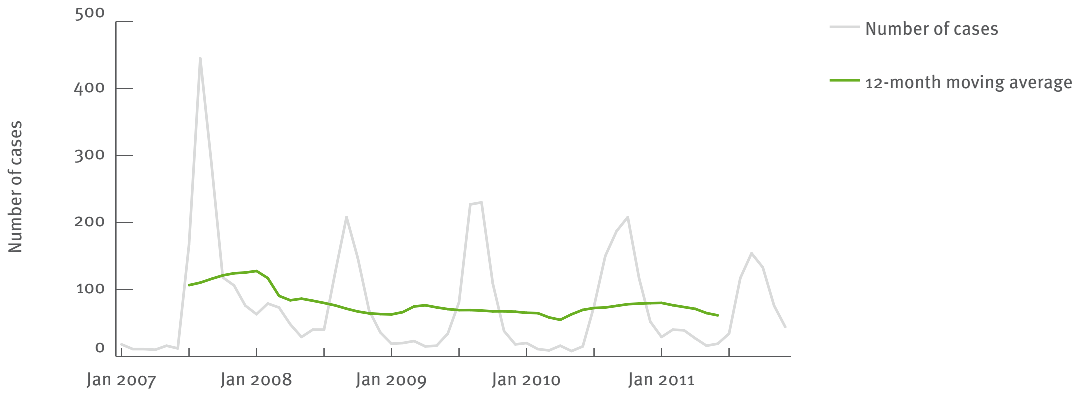
Seasonality

Tularaemia has a clear *seasonal* pattern, with most cases occurring in summer and early autumn. In 2011, the peak was in September (Figure 2.3.47).

Discussion

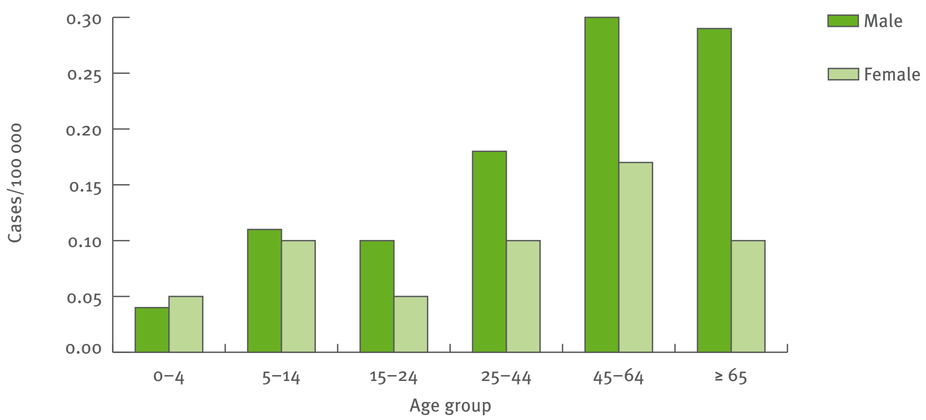
Since the reservoir of tularaemia is in hares and small rodents, the incidence in humans has been observed to follow the fluctuating numbers of animal populations, which are often cyclic. In Sweden – the country reporting the highest confirmed case rate – the main transmission route for tularaemia was through mosquito bites. *F. tularensis* has also been found to persist in natural waters and sediments in endemic areas in Sweden, also during non-outbreak years[3]. Several waterborne outbreaks have been reported after consumption of untreated natural spring water, e.g. in Turkey[4,5,6].

Figure 2.3.45. Trend and number of confirmed cases of tularaemia reported in the EU/EEA, 2007–2011



Source: Country reports from Austria, Bulgaria, Cyprus, the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Figure 2.3.46. Rates of confirmed tularaemia cases reported in the EU/EEA, by age and gender, 2007–2011



Source: Country reports from Austria, the Czech Republic, Estonia, Finland, France, Germany, Hungary, Norway, Poland, Slovakia, Spain, and Sweden.

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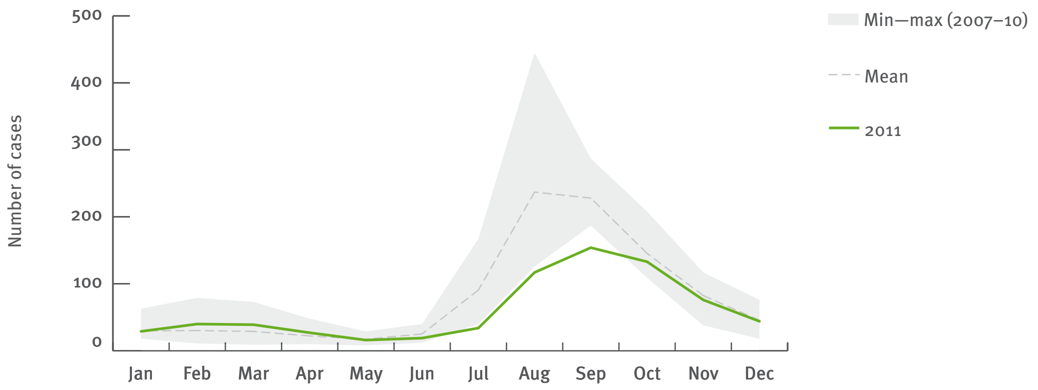
Figure 2.3.47. Seasonal distribution: Number of confirmed tularaemia cases by month, EU/EA countries, 2007–2011



Source: Country reports from Austria, Cyprus, the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Luxembourg, Malta, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by: Laboratories	Physicians	Hospitals	Others	National coverage	National reference laboratory data	Comparable data available	Case definition used
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Belgium	BE-REFLAB	V	Co	P	C	Y	N	N	N	Y	-	-	Not specified/unknown
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	Y	-	-	EU-2008
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y	-	-	EU-2008
Estonia	EE-ANTH/CHOL/DIPH/MALA/SPOX/TRIC/TULA/TYPH	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Finland	FI-NIDR	Cp	Co	P	C	Y	N	N	N	Y	-	-	Not specified/unknown
France	FR-MANDATORY_INFECTIOUS_DISEASES	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	Not specified/unknown
Germany	DE-SURVNET@RKI-7.1	Cp	Co	P	C	Y	N	N	Y	Y	-	-	Other
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Hungary	HU-EFRIR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Ireland	IE-CIDR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Italy	IT-NRS	Cp	Co	P	C	N	Y	Y	N	Y	-	-	Other
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU case definition (legacy/deprecated)
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	Not specified/unknown
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Romania	RO-RNSSy	Cp	Co	P	C	N	N	Y	N	Y	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y	-	-	EU-2008
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Spain	ES-STATUTORY_DISEASES	Cp	Co	P	C	N	Y	Y	N	Y	-	-	EU-2008
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
United Kingdom	UK-TULARAEMIA	V	Co	P	C	Y	N	Y	Y	Y	-	-	Other

Typhoid/paratyphoid fever

- In 2011, 1155 confirmed cases of typhoid and paratyphoid fever were reported in the EU and EEA countries, which was a 21% decrease on 2010.
- In total, 90% of cases were imported, the majority from India and Pakistan.
- Reported case rates were highest among 15–24-year-olds in 2011.
- There were more cases of typhoid fever reported than paratyphoid fever.
- *Salmonella* Paratyphi A was the most commonly reported serotype in paratyphoid fever cases.

Typhoid and paratyphoid fever are systemic bacterial diseases, which are caused by infection with *Salmonella enterica* serovars Typhi (typhoid fever), Paratyphi A, Paratyphi B or Paratyphi C (paratyphoid fever). Humans are the only source of these bacteria and can be short- or long-term asymptomatic carriers. Transmission occurs via the faecal-oral route, through person-to-person contact, or contaminated water or food. The infection is uncommon in the EU/EEA, and most cases are reported by travellers returning from countries where the disease is endemic. The highest risk of typhoid and paratyphoid fever exists for travellers to southern Asia[1].

Table 2.3.21. Numbers and rates of confirmed typhoid and paratyphoid cases reported in the EU/EEA, 2007–2011

Country	2011						2010		2009		2008		2007	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population			Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Rate	Age-standardised rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	Y	C	8	4	0.05	0.05	30	0.36	0	0.00	14	0.17	0	0.00
Belgium	N	C	50	50	-	-	72	-	104	-	61	-	43	-
Bulgaria	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyprus	Y	C	1	1	0.12	0.11	1	0.12	4	0.50	5	0.63	1	0.13
Czech Republic	Y	C	7	7	0.07	0.07	5	0.05	4	0.04	6	0.06	6	0.06
Denmark	Y	C	14	14	0.25	0.27	18	0.33	17	0.31	19	0.35	14	0.26
Estonia	Y	C	0	0	0.00	0.00	1	0.08	3	0.22	0	0.00	2	0.15
Finland	Y	C	6	6	0.11	0.12	17	0.32	9	0.17	6	0.11	20	0.38
France	Y	C	146	146	0.22	0.23	222	0.34	264	0.41	236	0.37	167	0.26
Germany	Y	C	116	114	0.14	0.15	128	0.16	141	0.17	179	0.22	126	0.15
Greece	Y	C	8	8	0.07	0.08	12	0.11	4	0.04	11	0.10	18	0.16
Hungary	Y	C	0	0	0.00	0.00	4	0.04	0	0.00	3	0.03	0	0.00
Ireland	Y	C	16	16	0.36	0.32	14	0.31	17	0.38	13	0.30	12	0.28
Italy	Y	C	89	89	0.15	0.16	134	0.22	120	0.20	123	0.21	182	0.31
Latvia	Y	C	0	0	0.00	0.00	0	0.00	-	-	0	0.00	1	0.04
Lithuania	Y	C	2	2	0.06	0.06	1	0.03	0	0.00	2	0.06	-	-
Luxembourg	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	-	-	0	0.00
Malta	Y	C	2	2	0.48	0.44	1	0.24	1	0.24	0	0.00	0	0.00
Netherlands	Y	C	56	56	0.34	0.34	72	0.43	48	0.29	66	0.40	55	0.34
Poland	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Portugal	Y	C	14	14	0.13	0.13	16	0.15	34	0.32	21	0.20	44	0.42
Romania	Y	C	0	0	0.00	0.00	3	0.01	2	0.01	-	-	-	-
Slovakia	Y	C	2	2	0.04	0.04	6	0.11	2	0.04	0	0.00	1	0.02
Slovenia	Y	C	3	3	0.15	0.15	2	0.10	2	0.10	5	0.25	10	0.50
Spain	N	C	47	47	-	-	37	-	26	-	21	-	33	-
Sweden	Y	C	24	24	0.26	0.27	42	0.45	38	0.41	49	0.53	47	0.52
United Kingdom	Y	C	524	524	0.84	0.84	586	0.95	503	0.82	596	0.97	20	0.03
EU total	**-**	**-**	**1135**	**1129**	**0.26**	**0.27**	**1424**	**0.33**	**1343**	**0.31**	**1436**	**0.36**	**802**	**0.20**
Iceland	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	2	0.63	0	0.00
Liechtenstein	-	-	-	-	-	-	-	-	-	-	0	0.00	0	0.00
Norway	Y	C	26	26	0.53	0.52	34	0.70	28	0.58	33	0.70	45	0.96
Total	**-**	**-**	**1161**	**1155**	**0.26**	**0.27**	**1458**	**0.33**	**1371**	**0.31**	**1471**	**0.37**	**847**	**0.21**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

Epidemiological situation in 2011

In 2011, 1 155 confirmed cases (total 1 161) of human typhoid or paratyphoid were reported by 25 EU Member States, Iceland and Norway which was a 21% decrease on 2010. The reported confirmed case rate was 0.26 per 100 000 population (Table 2.3.21). Two Member States (Bulgaria and Poland) do not distinguish typhoid/paratyphoid fever cases from 'salmonellosis', and their data cannot be included here. In 2011, the confirmed case rate was the lowest observed in the last four years (Figure 2.3.48). In 2011, the highest confirmed case rate was reported by the United Kingdom (0.84 per 100 000 population).

Age and gender distribution

In 2011, the highest confirmed case rate (0.46 per 100 000 population) was reported in 15–24-year-olds followed by children under five years (0.37 per 100 000) and 25–44-year-olds (0.35 per 100 000) (Figure 2.3.49). This represented a change in trend compared to previous years as the rate is normally highest in children under five years. The lowest rate was reported for ≥65-year-olds (0.06 per 100 000). In 2011, as in previous years, typhoid/paratyphoid fever was slightly more common in men than in women, particularly among people aged between 15 and 44 years. The overall confirmed case rates for males and females were 0.28 and 0.24 per 100 000 population respectively, and the male-to-female ratio was 1.21:1.

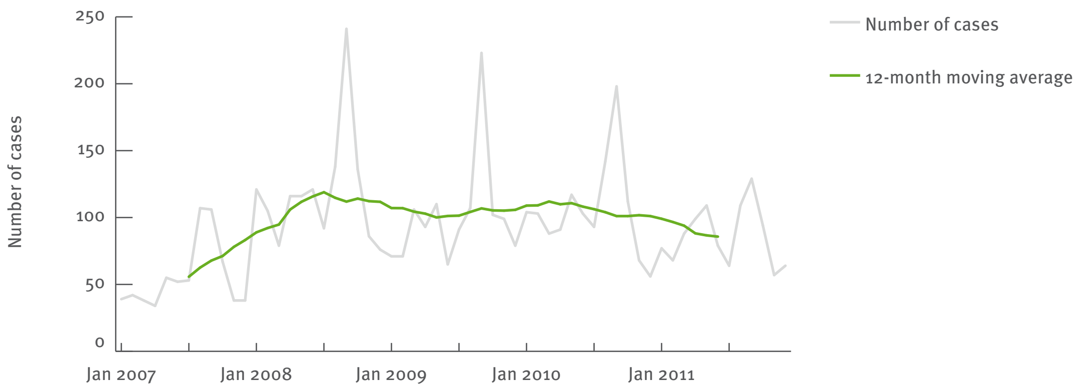
Seasonality

The seasonality for typhoid and paratyphoid fever followed that of the previous three years (2007 excluded due to missing data), with a clear peak in September, although this was lower in 2011 (Figure 2.3.50).

Enhanced surveillance

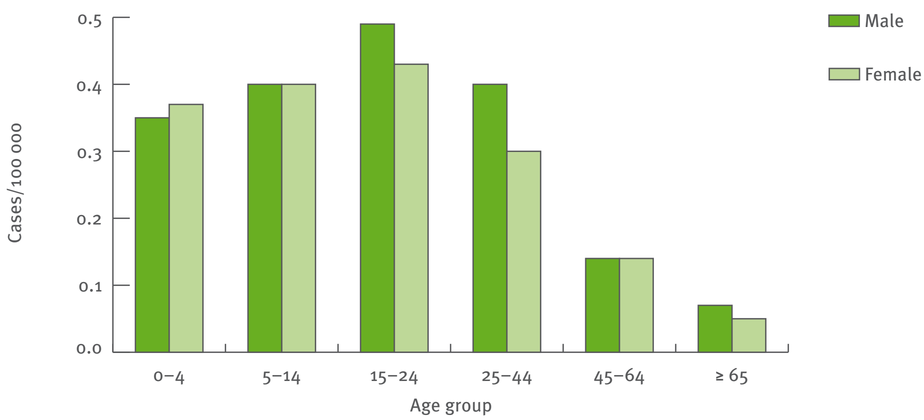
As in previous years, a high proportion of cases were travel-associated (90% of 648 cases for which data were available). The proportion of travel-associated cases varied between 50% and 100% in the countries which provided this information, with the exception of Spain where all cases were reported as domestically acquired. Non-EU countries were reported as the most

Figure 2.3.48. Trend and number of confirmed cases of typhoid and paratyphoid cases reported in the EU/EEA, 2008–2011



Source: Country reports from Austria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Portugal, Slovakia, Slovenia, Sweden and the United Kingdom.

Figure 2.3.49. Rates of confirmed typhoid and paratyphoid cases reported in the EU/EEA, by age and gender, 2011



Source: country reports from Austria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

probable country of infection in 99% of imported cases, and the three countries most frequently mentioned were India (n=242 cases), Pakistan (n=125) and Bangladesh (n=28).

In 2011, 631 cases of typhoid fever and 435 of paratyphoid fever were reported. The most common serotype of paratyphoid fever was *S.* Paratyphi A (Table 2.3.22).

Table 2.3.22. *Salmonella* enterica serotypes of typhoid and paratyphoid fever cases reported in the EU/EEA, 2011

Serotype	Number of cases
Typhi	631
Paratyphi A	329
Paratyphi B	95
Paratyphi C	5
Paratyphi (unspecified)	6
Total	**1066**

Serotype data reported by: Austria, Belgium, Cyprus, the Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Lithuania, Malta, the Netherlands, Norway, Portugal, Slovakia, Slovenia, Spain, Sweden and the United Kingdom. Italy did not specify the serotype and Estonia, Hungary, Iceland, Latvia, Luxemburg and Romania reported zero cases.

Discussion

Typhoid and paratyphoid fever continue to be uncommon infections in EU/EEA countries. Most cases (90%) are imported and the disease is strongly associated with travel to endemic areas outside the EU[2–4]. The seasonal pattern, with a clear peak in cases during September, also reflects travel during the holiday period, with disease onset and reporting after the return home.

The high confirmed case rate reported in the United Kingdom could be attributed to residents of Asian origin, particularly those from the Indian subcontinent, with recent travel history to these areas, as described by Clark et al[3].

A possible explanation for the decreased typhoid/paratyphoid cases reported in the EU/EEA in 2011 could be that the amount of international travel has decreased as a result of the financial crisis. This is supported by the marked reduction in cases during the late summer months, which is the major holiday period in the EU[5]. However, travel statistics from Eurostat do not fully support this theory as in 2011 the number of long, outbound holiday trips increased against 2010 and it was chiefly the number of business trips which were negatively affected by the financial crisis[5].

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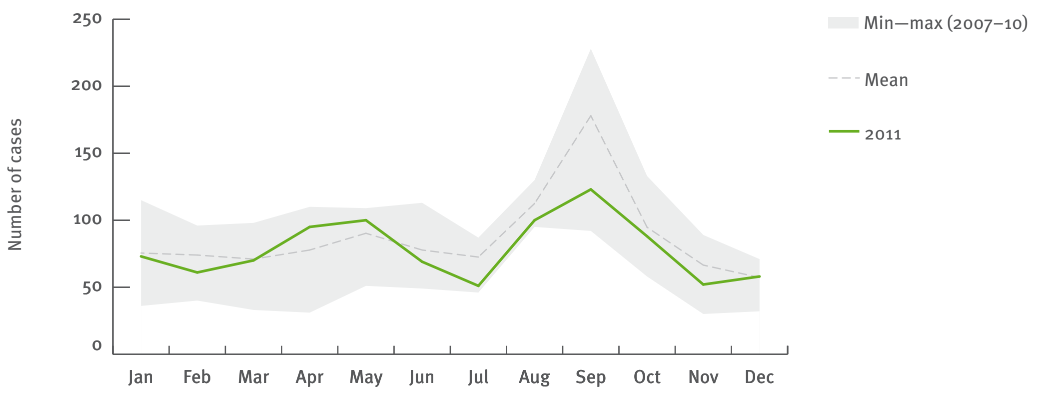
Figure 2.3.50. Seasonal distribution: Number of confirmed cases of typhoid and paratyphoid cases by month, EU/EEA, 2008–2011



Source: Country reports from Austria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Portugal, Slovakia, Slovenia, Sweden and the United Kingdom.

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by: Laboratories	Physicians	Hospitals	Others	National coverage	National reference laboratory data	Comparable data available	Case definition used
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Belgium	BE-REFLAB	V	Co	P	C	Y	N	N	N	Y	-	-	Not specified/unknown
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y	-	-	EU-2008
Denmark	DK-LAB	Cp	Co	P	C	Y	N	N	N	Y	-	-	Other
Estonia	EE-SALMONELLOSIS	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Finland	FI-NIDR	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
France	FR-NATIONAL_REFERENCE_CENTRES	V	Co	P	C	Y	N	N	N	Y	-	-	Other
Germany	DE-SURVNET@RKI-7.1	Cp	Co	P	C	Y	N	N	Y	Y	-	-	Other
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Hungary	HU-Zoonoses	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Ireland	IE-CIDR	-	-	-	-	-	-	-	-	-	-	-	Not specified/unknown
Italy	IT-NRS	-	-	-	-	-	-	-	-	-	-	-	Not specified/unknown
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Luxembourg	LU-LNS-Microbio	V	Co	P	C	Y	N	Y	N	Y	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Netherlands	NL-OSIRIS	Cp	Co	P	C	Y	Y	N	Y	Y	-	-	EU-2008
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	Not specified/unknown
Portugal	PT-SALMONELLOSIS	Cp	Co	P	C	N	Y	N	N	Y	-	-	Other
Romania	RO-RNSSy	Cp	Co	P	C	Y	N	Y	N	Y	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y	-	-	EU-2008
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Spain	ES-MICROBIOLOGICAL	V	Se	P	C	Y	N	N	N	N	-	-	EU-2008
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
United Kingdom	UK-SALMONELLOSIS	O	Co	P	C	Y	N	Y	Y	Y	-	-	Other

Variant Creutzfeldt-Jakob disease (vCJD)

- Variant CJD is a rare but fatal neurodegenerative disease.
- Three new cases were reported in the EU and EEA countries in 2011.
- Continued surveillance of vCJD is crucial to closely monitor the gradual elimination of the disease and the impact of the control measures that have been taken at EU level.

Variant Creutzfeldt-Jakob disease is a human prion disease that produces a fatal spongiform encephalopathy, which is manifested by a rapidly progressing dementia. Transmission to humans is associated to the consumption of meat products from infected cattle but the incubation period is several years. The disease has become very rare due to the effective control measures that have been established at the EU level over ten years ago. Few human infections through blood transfusion have also been documented.

Epidemiological situation in 2011

In 2011, there were three new fatal vCJD cases reported in the EU. The United Kingdom reported two cases. However, the total numbers of deaths due to vCJD were five in the United Kingdom in 2011 but three of five cases were diagnosed as probable cases already in 2009. France reported one case. None of the cases was blood donor or recipient of blood or blood products. The overall mortality rate remains low at 0.01 per 1 000 000 population.

Age and gender distribution

The three cases reported in 2011 were two males from the United Kingdom (36 and 56 years of age) and a 20-year-old female from France.

Discussion

vCJD has become a very rare neurodegenerative disease in the EU as a result of successful prevention and control measures implemented at the EU level since 2011. ECDC has continued with the diagnostic support to the countries across Europe and global monitoring of the disease occurrence continues through the EuroCJD network[1]. The long incubation period of vCJD, the lack of reliable laboratory methodologies that allow the early confirmed diagnosis of the disease on live patients and the unknown risk of new methods of transmission, e.g. through infected medical instruments[2], justifies the need for close continued surveillance at the national and EU level.

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Yersiniosis

- Yersiniosis decreased significantly in the EU/EEA during the five-year period 2007–2011.
- In 2011, 7 041 confirmed cases of human yersiniosis were reported (2% increase on 2010 when 6 909 cases were reported).
- In 2011, the confirmed case rate of yersiniosis was 2.19 cases per 100 000 population in the EU and EEA countries.

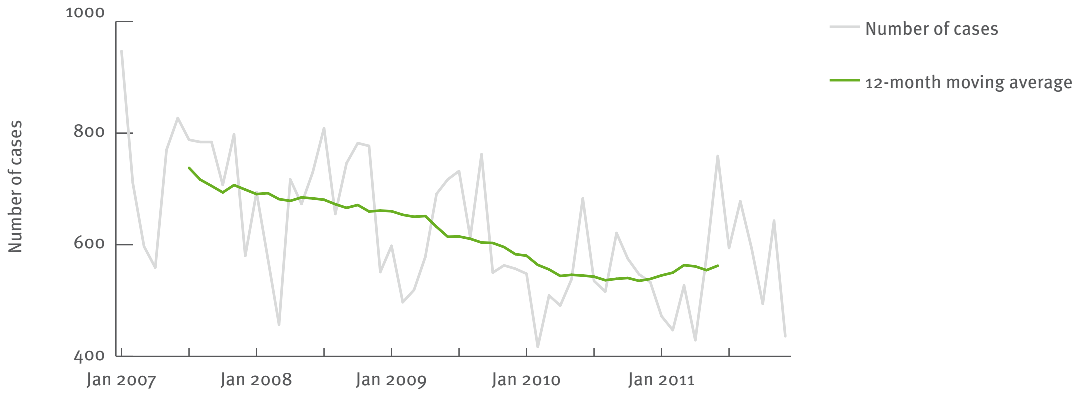
The highest rate of confirmed cases was observed in children aged 0–4 years: 11.42 cases per 100 000 population, which is more than ten times higher than the respective rates in adults.

The enteric form of yersiniosis is caused by two pathogenic *Yersinia* species (*Y. enterocolitica* and *Y. pseudotuberculosis*). These bacteria are a common cause of gastroenteritis (sometimes mimicking appendicitis) in a number of the EU/EEA countries. Pigs are an important reservoir for *Y. enterocolitica*, and many cases are considered to be related to the consumption of undercooked contaminated pork.

Epidemiological situation in 2011

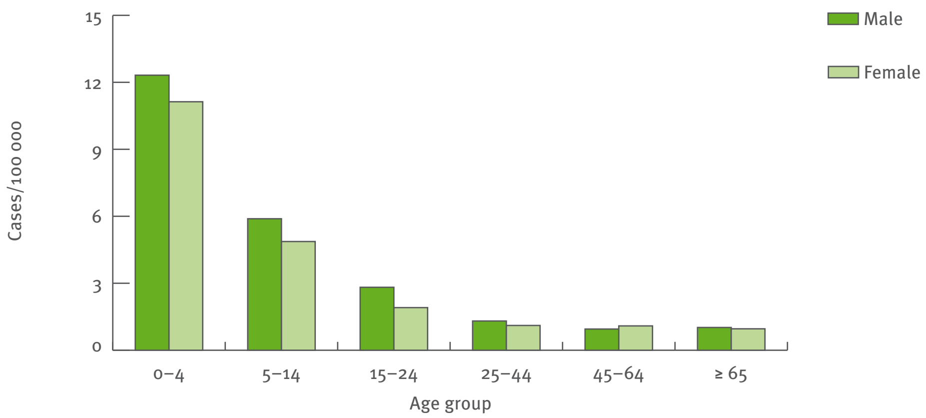
In 2011, 7 041 confirmed cases of yersiniosis were reported by 25 EU/EEA countries, with an overall confirmed case rate of 2.19 per 100 000 population. As in previous years, Germany accounted for the highest proportion: 47.9% of all reported cases in the EU/EEA. Lithuania and Finland were the countries with the

Figure 2.3.51. Trend and number of confirmed cases of yersiniosis reported in the EU/EEA, 2007–2011



Source: Country reports from Austria, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Latvia, Lithuania, Malta, Norway, Poland, Slovakia, Slovenia, Sweden and the United Kingdom.

Figure 2.3.52. Rates of confirmed yersiniosis cases reported in the EU/EEA, by age and gender, 2011



Source: Country reports from Austria, Belgium, Bulgaria, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

highest confirmed case rates: 11.40 and 10.31 cases per 100 000 population, respectively (Table 2.3.23).

Between 2007 and 2011, a significant reduction in confirmed cases of yersiniosis was observed in the EU/EEA countries (Figure 2.3.51). Six EU countries reported this reduction (Denmark, Germany, Lithuania, Slovenia, Spain and Sweden), while a significant increase was observed in Hungary, Romania and Slovakia[1].

As in previous years, *Y. enterocolitica* was the most common *Yersinia* species reported in human cases (98.4% of all confirmed cases in 2011) followed by *Y. pseudotuberculosis* in 0.9% of cases[1].

Age and gender distribution

The gender distribution of confirmed cases for which information was provided (n=7 016), was 53.2 % for males and 46.4 % for females in the EU/EEA countries. The male-to-female ratio was 1.2:1 in 2011. Confirmed case rates were higher for males compared to females in the age group 0–24 years yet remained similar for both genders in the older age groups (>=25 years). The highest confirmed case rates were detected in 0–4-year-olds, both males (12.28 cases per 100 000) and females (11.08 cases per 100 000) (Figure 2.3.52).

Seasonality

Cases of yersiniosis were reported throughout the year with an increase in cases during the spring, starting from April and peaking in June and August in 2011 (Figure 2.3.53).

Discussion

Human yersiniosis has shown a significant five-year decreasing trend in the EU since 2007. Yersiniosis is still the third most commonly reported zoonoses in humans and a commonly reported gastrointestinal disease in Europe. *Yersinia* is mainly found in pigs and pork, but may also be found in other foodstuffs and other animal species in the EU[1]. Pigs are considered the main

Table 2.3.23. Numbers and rates of confirmed yersiniosis cases reported in the EU/EEA, 2007–2011

Country	2011						2010		2009		2008		2007	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population			Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Rate	Age-standardised rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Austria	Y	C	142	119	1.42	1.48	84	1.00	140	1.68	93	1.12	142	1.71
Belgium	N	C	214	214	-	-	216	-	238	-	273	-	248	-
Bulgaria	Y	A	4	4	0.05	0.06	5	0.07	8	0.11	10	0.13	8	0.10
Cyprus	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Czech Republic	Y	C	460	460	4.37	4.51	447	4.25	463	4.42	557	5.37	576	5.60
Denmark	Y	C	225	225	4.05	4.01	193	3.49	238	4.32	331	6.05	274	5.03
Estonia	Y	C	69	69	5.15	5.08	58	4.33	54	4.03	42	3.13	76	5.66
Finland	Y	C	554	554	10.31	10.31	522	9.75	633	11.88	608	11.47	480	9.10
France	N	A	294	294	-	-	238	-	208	-	213	-	-	-
Germany	Y	C	3361	3345	4.09	4.62	3346	4.09	3731	4.55	4352	5.29	4987	6.06
Greece	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hungary	Y	C	93	93	0.93	0.95	87	0.87	51	0.51	40	0.40	55	0.55
Ireland	Y	C	6	6	0.13	0.11	3	0.07	3	0.07	3	0.07	6	0.14
Italy	N	C	15	15	-	-	15	-	11	-	-	-	-	-
Latvia	Y	C	28	28	1.26	1.36	23	1.02	45	1.99	50	2.20	41	1.80
Lithuania	Y	C	370	370	11.40	11.56	428	12.86	483	14.42	536	15.92	569	16.81
Luxembourg	Y	C	33	33	6.45	6.21	35	6.97	0	0.00	17	3.51	22	4.62
Malta	Y	C	0	0	0.00	0.00	1	0.24	0	0.00	0	0.00	0	0.00
Netherlands	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Poland	Y	C	258	250	0.65	0.66	205	0.54	288	0.76	214	0.56	182	0.48
Portugal	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Romania	Y	C	47	47	0.22	0.23	27	0.13	5	0.02	9	0.04	0	0.00
Slovakia	Y	C	170	166	3.05	3.05	166	3.06	167	3.09	68	1.26	71	1.32
Slovenia	Y	C	16	16	0.78	0.86	16	0.78	27	1.33	31	1.54	32	1.59
Spain	N	C	264	264	-	-	325	-	291	-	315	-	381	-
Sweden	Y	C	350	350	3.72	3.60	281	3.01	397	4.29	546	5.95	567	6.22
United Kingdom	Y	C	59	59	0.09	0.07	55	0.09	61	0.10	48	0.08	86	0.14
EU total	**-**	**-**	**7032**	**6981**	**2.20**	**2.24**	**6776**	**2.13**	**7542**	**2.42**	**8356**	**2.70**	**8803**	**2.93**
Iceland	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	60	60	1.22	1.20	52	1.07	60	1.25	50	1.06	71	1.52
Total	**-**	**-**	**7092**	**7041**	**2.19**	**2.22**	**6828**	**2.11**	**7602**	**2.40**	**8406**	**2.67**	**8874**	**2.90**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

reservoir of the bacterium as they regularly harbour the *Y. enterocolitica* serotypes which are pathogenic to humans. The most frequent route of transmission to humans is through the consumption of undercooked, contaminated pork.

Most yersiniosis cases are sporadic and outbreaks are rarely reported. In 2011, seven Member States reported a total of 17 possible *Yersinia* outbreaks[1]. One of them was linked to mixed food consumed at a restaurant which accounted for seven human cases in Denmark. In Norway, packed salad mix containing radicchio rosso was suspected as a source of a *Y. enterocolitica* O:9 outbreak with 21 cases[2,3]. The human isolates were identical with MLVA typing, geographically widespread and occurred in higher numbers among females than males.

The results from the epidemiological studies revealed that a limited number of cases had consumed pork products and the outbreak was associated with consumption of ready-to-eat salad products. However, *Y. enterocolitica* O:9 was not confirmed in any food samples.

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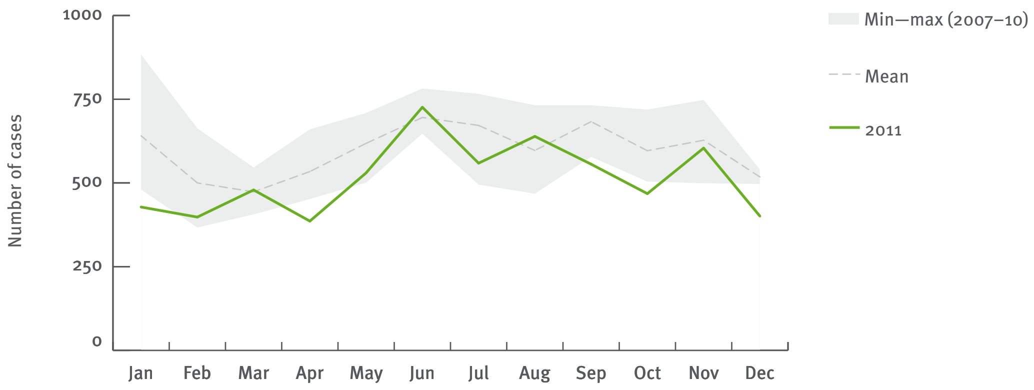
Figure 2.3.53. Seasonal distribution: Number of confirmed cases of yersiniosis by month, EU/EEA, 2007–2011



Source: Country reports from Austria, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Latvia, Lithuania, Malta, Norway, Poland, Slovakia, Slovenia, Sweden and the United Kingdom.

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by				National coverage	National reference laboratory data	Comparable data available	Case definition used
						Laboratories	Physicians	Hospitals	Others				
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Belgium	BE-LABNET	V	Se	A	C	Y	N	-	-	Y	-	-	Not specified/unknown
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	Y	-	-	EU-2002
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y	-	-	Other
Denmark	DK-LAB	Cp	Co	P	C	Y	N	N	N	Y	-	-	Other
Estonia	EE-YERSINIOSIS	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Finland	FI-NIDR	Cp	Co	P	C	Y	N	N	N	Y	-	-	Not specified/unknown
France	FR-NATIONAL_REFERENCE_CENTRES	V	Co	P	C	Y	N	N	N	N	-	-	Other
Germany	DE-SURVNET@RKI-7.1	Cp	Co	P	C	Y	N	N	Y	Y	-	-	Other
Hungary	HU-Zoonoses	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Ireland	IE-CIDR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Italy	IT-ENTERNET	V	Se	P	C	Y	N	N	N	-	-	-	Other
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	Not specified/unknown
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	N	Y	Y	N	Y	-	-	EU-2008
Romania	RO-RNSSy	Cp	Co	P	C	Y	N	Y	N	Y	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y	-	-	EU-2008
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Spain	ES-MICROBIOLOGICAL	V	Se	P	C	Y	N	N	N	N	-	-	EU-2008
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
United Kingdom	UK-YERSINOSIS	O	Co	P	C	Y	N	Y	Y	Y	-	-	Other

2.4 Emerging and vector-borne diseases

Malaria

- The confirmed case rate of malaria reported by EU/EEA countries remains stable, fluctuating around one per 100 000 population.
- Ninety-nine per cent of cases (where origin is specified) are imported; these are reported by EU/EEA countries that have strong traditional ties with endemic areas. Greece is an exception with 41% of locally acquired cases.
- Local transmission remains possible in the EU and highlights the need for surveillance, preparedness and prevention, including the improvement of access to healthcare for migrants.

Malaria is caused by infection with a protozoon of the genus *Plasmodium*, transmitted through the bite of an infected *Anopheles* mosquito.

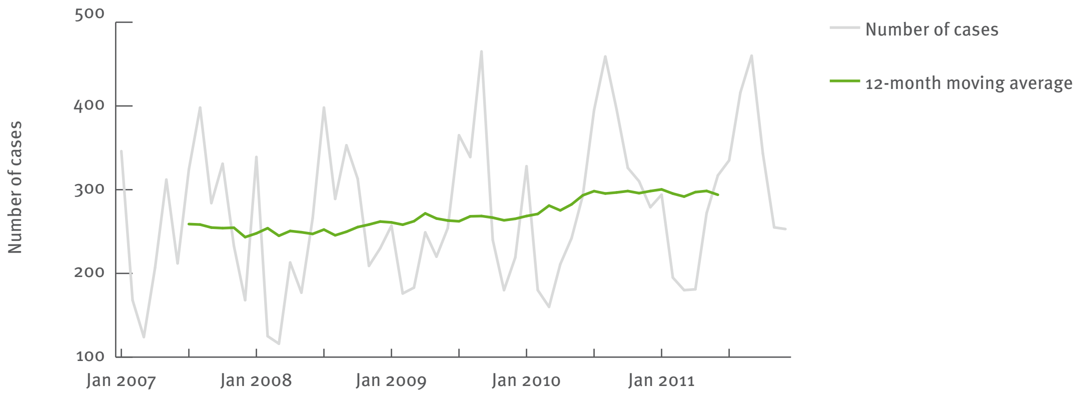
Epidemiological situation in 2011

In 2011, 5 482 confirmed cases of malaria were reported by 25 EU Member States and one EEA country in continental Europe; these do not include cases reported in overseas departments and territories. Eighty-three per cent of the cases were reported by four countries: France, the United Kingdom, Germany and Spain). The highest rates of confirmed cases were reported by the United Kingdom, the Netherlands, Ireland and Sweden (Table 2.4.1). No estimate for France is available because their surveillance system is not nationwide. Data were not available for Denmark, Italy, Iceland and Liechtenstein. Sixteen countries used the EU case definition.

The overall confirmed case rate was 0.94 per 100 000 population in 2011. The individual country rates varied between 0.02 (Slovakia) and 2.70 cases (United Kingdom) per 100 000 population. These figures are slightly lower than the ones observed in 2010.

Most malaria cases are reported as imported – the definition of imported cases refers to cases imported to continental Europe. Information on the probable country of infection was not consistently available. Based on the available information most cases were imported from an African country (more than 80%). Forty-one cases were reported as not imported, of which 38 were from Greece, one from France, one from the Netherlands and one from Spain. The number of imported malaria cases in the EU does not show a significant trend (Figure 2.4.1).

Figure 2.4.1. Trend and number of confirmed cases of malaria reported in the EU/EEA, 2007–2011



Source: Country reports: Austria, Cyprus, the Czech Republic, Estonia, Finland, France, Germany, Hungary, Ireland, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, United Kingdom.

Age and gender distribution

Information on age group was available for 65% of the cases. The confirmed case rate of malaria was more than twice as high in males as in females (1.31 and 0.54 per 100 000, respectively), giving a male-to-female ratio of 2.4:1). The age group 25–44 years had the highest rates (1.52 per 100 000 population, 2.15 in males and 0.87 in females) (Figure 2.4.2). This is consistent with the picture described in previous years and likely reflects population travel patterns rather than other risk factors.

Seasonality

Information on month of reporting was available for 65% of cases. A clear seasonal trend in monthly reports is observed across all countries, with cases increasing during the summer holiday months (July–October) and peaking in September. A lower increase in January was observed, possibly related to the winter holiday period (Figure 2.4.3).

Updates from epidemic intelligence in 2012

Between 25 May and 26 October 2012, 76 cases of malaria were reported in Greece. Sixteen cases refer to patients with no history of travel to a malaria-endemic country, with evidence that they had acquired the infection locally during the transmission period in 2012. Cases were reported from the municipalities of Evrotas, Marathon, Markopoulo, Sofades, Avdira and one case was attributed to the area around Lake Paralimni (Viotia). Sixty of the 76 cases were classified as imported. Fifty-four of the 60 cases were reported in migrants from malaria-endemic areas and six imported *Plasmodium falciparum* cases were reported from Greek travellers.

In addition, Italy recently published information on a 'locally introduced case' in the Calabria region (southern Italy)[1].

Discussion

The confirmed case rate of malaria reported by EU/EEA countries has remained stable over recent years,

Table 2.4.1. Numbers and rates of confirmed malaria cases reported in the EU/EEA, 2007–2011

Country	2011					2010		2009		2008		2007	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Crude rate	Cases	Crude rate	Cases	Crude rate	Cases	Crude rate	Cases	Crude rate
Austria	Y	C	44	7	0.08	48	0.57	44	0.53	57	0.69	34	0.41
Belgium	N	C	184	184	-	166	-	144	1.34	181	-	193	-
Bulgaria	Y	A	8	8	0.11	5	0.07	8	0.11	0	0.00	4	0.05
Cyprus	Y	C	6	6	0.71	1	0.12	1	0.13	0	0.00	1	0.13
Czech Republic	Y	C	28	28	0.27	11	0.11	10	0.10	22	0.21	23	0.22
Denmark	-	-	-	-	-	-	-	-	-	-	-	-	-
Estonia	Y	C	1	1	0.08	1	0.08	4	0.30	0	0.00	5	0.37
Finland	Y	C	33	33	0.61	33	0.62	34	0.64	42	0.79	22	0.42
France	N	A	1891	1891	-	2439	-	2199	-	2246	3.51	-	-
Germany	Y	C	562	562	0.69	615	0.75	523	0.64	547	0.67	540	0.66
Greece	Y	C	92	92	0.81	45	0.40	51	0.45	39	0.35	21	0.19
Hungary	Y	C	10	10	0.10	5	0.05	8	0.08	5	0.05	7	0.07
Ireland	Y	C	61	61	1.34	82	1.84	90	2.02	82	1.86	71	1.65
Italy	-	-	-	-	-	662	1.10	651	1.08	586	0.98	501	0.85
Latvia	Y	C	4	4	0.19	5	0.22	6	0.27	2	0.09	3	0.13
Lithuania	Y	C	3	3	0.10	3	0.09	3	0.09	3	0.09	4	0.12
Luxembourg	Y	C	3	3	0.59	12	2.39	3	0.61	2	0.41	4	0.84
Malta	Y	C	1	1	0.24	0	0.00	1	0.24	3	0.73	3	0.74
Netherlands	Y	C	253	253	1.52	247	1.49	237	1.44	229	1.40	210	1.28
Poland	Y	C	14	14	0.04	35	0.09	22	0.06	22	0.06	11	0.03
Portugal	Y	C	67	67	0.65	50	0.48	44	0.42	42	0.40	43	0.41
Romania	Y	C	40	40	0.19	19	0.09	12	0.06	13	0.06	24	0.11
Slovakia	Y	C	1	1	0.02	2	0.04	0	0.00	2	0.04	1	0.02
Slovenia	Y	C	7	6	0.29	9	0.44	7	0.34	3	0.15	9	0.45
Spain	Y	C	405	405	0.88	351	0.76	356	0.78	290	0.64	385	0.87
Sweden	Y	C	95	95	1.01	115	1.23	81	0.88	91	0.99	89	0.98
United Kingdom	Y	C	1677	1677	2.70	1761	2.86	1495	2.43	1371	2.26	1548	2.57
EU total	**-**	**-**	**5490**	**5452**	**0.94**	**6722**	**0.98**	**6034**	**0.89**	**5880**	**1.19**	**3756**	**0.86**
Iceland	-	-	-	-	-	-	-	-	-	-	-	1	0.33
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	30	30	0.61	37	0.76	34	0.71	32	0.68	28	0.60
Total	**-**	**-**	**5520**	**5482**	**0.94**	**6759**	**0.98**	**6068**	**0.89**	**5912**	**1.18**	**3785**	**0.86**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

fluctuating around one per 100 000 population per year. Nearly all (99%) of the reported cases are imported and are notified by EU/EEA countries that have strong ties with endemic areas. The seasonality and age distribution most likely reflect travel patterns to malaria-endemic countries. Outside continental Europe, some countries or territories are endemic for malaria (e.g. Mayotte and French Guiana), for which data are not collected through TESSy.

Historically, malaria was endemic in Europe, but it has been eliminated in most parts of the EU/EEA, which were declared malaria-free in the 1970s. However, cases of indigenous transmission of malaria have occasionally been reported over the last 10 years[2-5]. In 2011, the Netherlands reported one case of *Plasmodium malariae* which was transmitted through blood donation[6]. Greece reported local transmission of malaria for the fourth year running: local cases of malaria have occurred in Greece since 2009, with the highest number reported in 2011. In 2012, local malaria transmission still took place but fewer cases were reported, with the municipality of Evrotas as the most affected locality.

These reports indicate that local transmission of *Plasmodium falciparum* and *Plasmodium vivax* remains possible in the EU where the mosquito vectors are present and stresses the need for surveillance, preparedness and prevention within EU/EEA countries, including the improvement of access to healthcare for migrants. Moreover, travellers visiting friends and relatives in endemic countries constitute a significant group for malaria importation in developed countries[7].

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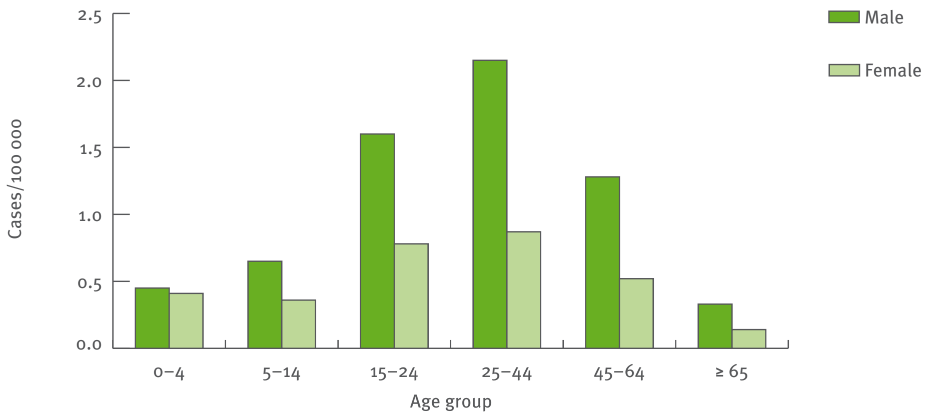
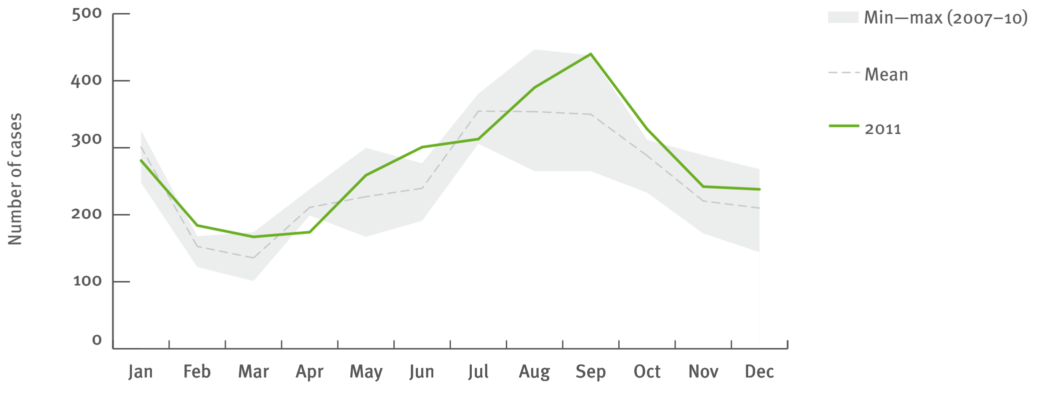
Figure 2.4.2. Rates of confirmed malaria cases reported in the EU/EEA, by age and gender, 2007–2011



Source: Country reports from Austria, Belgium, Cyprus, the Czech Republic, Estonia, Finland, Germany, Greece, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Figure 2.4.3. Seasonal distribution: Number of cases of malaria by month, EU/EEA, 2007–2011



Source: Country reports from Austria, Cyprus, the Czech Republic, Estonia, Finland, Germany, Greece, Hungary, Ireland, Malta, the Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by				National coverage
						Laboratories	Physicians	Hospitals	Others	
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	Y
Belgium	BE-LABNET	V	Se	A	C	Y	N	-	-	Y
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	Y
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y
Estonia	EE-ANTH/CHOL/DIPH/MALA/SPOX/TRIC/TULA/TYPH	Cp	Co	P	C	Y	Y	Y	Y	Y
Finland	FI-NIDR	Cp	Co	P	C	Y	Y	N	N	Y
France	FR-NATIONAL_REFERENCE_CENTRES	V	Co	P	C	Y	N	N	N	N
Germany	DE-SURVNET@RKI-7.3	Cp	Co	P	C	Y	N	N	N	Y
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y
Hungary	HU-EFRIR	Cp	Co	P	C	Y	Y	Y	N	Y
Ireland	IE-CIDR	Cp	Co	P	C	Y	Y	Y	N	Y
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	Y	Y	N	N	Y
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y
Netherlands	NL-OSIRIS	Cp	Co	P	C	Y	Y	N	N	Y
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	Y
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	N	Y	Y	N	Y
Portugal	PT-MALARIA	Cp	Co	P	C	N	Y	N	N	Y
Romania	RO-RNSSy	Cp	Co	P	C	N	N	Y	N	Y
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y
Spain	ES-STATUTORY_DISEASES	Cp	Co	P	C	N	Y	Y	N	Y
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y
United Kingdom	UK-MALARIA	O	Co	A	C	Y	N	Y	Y	Y

Plague (*Yersinia pestis* infection)

There were no cases of indigenous plague reported in the EU/EEA during 2011.

Plague, caused by the bacterium *Yersinia pestis*, is enzootic in wild rodents in some places in Eurasia, Africa and the Americas, and remains endemic in many natural foci around the world. Humans can be infected through 1) the bite of an infected flea carried by a rodent or, rarely, other animals, 2) direct contact with contaminated tissues, or 3) in rare cases, inhalation of respiratory secretions from infected persons or animals[1]. Untreated plague, particularly the pneumonic form, is often fatal. While urban plague has been controlled in most of the world, it remains a public health problem in rural areas in many countries.

Epidemiological situation in 2011

No cases of plague were reported by 29 EU/EEA countries in 2011. Data were not available for Liechtenstein.

Discussion

Autochthonous plague has not occurred in Europe for several decades. However, recent outbreaks have shown that plague may reoccur in areas that have long remained silent. More than fifty years after its last known occurrence, plague resurfaced in 2003 in a rural area south of Oran, Algeria[2], and cases also occurred in 2008 in the Laghouat area which was not previously known as a plague focus[3]. In Libya, the disease reoccurred near Tobruk in 2009, after 25 years without cases[4]. An even more recent epidemic was reported there in May 2011, for which the plague aetiology could not be confirmed due to political instability. Thus, neighbouring but independent plague foci coexist in Algeria and Libya. There is some evidence that these outbreaks were most likely caused by reactivation of organisms in local or regional foci believed to be dormant (Libya) or extinct (Algeria) for decades, rather than by recent importation of *Y. pestis* from distant foci. The outbreak in Libya was preceded by a particularly humid winter, which might have benefitted the enzootic cycle[5]. This further emphasises the need to consider the effect of environmental changes on infectious diseases that have a non-human reservoir.

Investigations into two outbreaks in the Democratic Republic of Congo showed the utility of a rapid diagnostic test detecting F1 antigen for initial diagnosis and public health management. It highlighted, however, the need for specialised sampling kits and trained personnel for quality specimen collection, and appropriate specimen handling and preservation for plague confirmation and *Y. pestis* isolation. Preparedness, followed by efficient frontline management and a streamlined diagnostic strategy are essential for confirming plague, especially in remote areas[6].

In places where plague is endemic (e.g. in the western part of the United States) visitors have to be aware of the presence of the bacteria, which is transmitted by fleas, and avoid contact with sick or dead rodents.

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Q fever

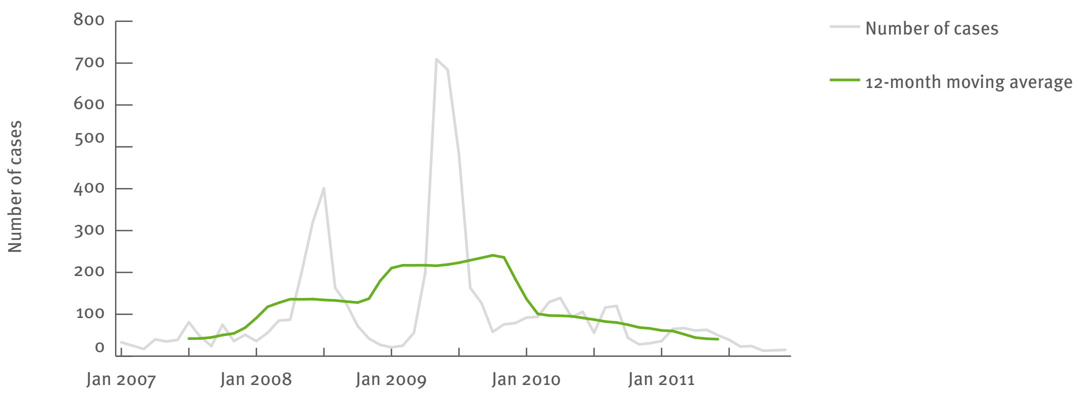
- A total of 759 confirmed Q fever infections were reported in 2011 from 24 EU/EEA countries.
- A sharp drop in case numbers is observed in the Netherlands, where a large outbreak occurred from 2007 to 2010, with more than 4 000 cases and 24 deaths. The outbreak is considered to be over.
- A reduction in case numbers was observed in most countries. Small outbreaks still occur in Europe where areas with infected sheep and goat herds are considered at risk.

Q fever, or query fever, is a zoonotic disease caused by the bacterium *Coxiella burnetii*. Cattle, sheep and goats are the primary domestic animal reservoirs, and the bacteria are excreted in high numbers in birth products, and in milk, urine and faeces. The bacteria can survive for long periods in the environment and are very resistant to physical and chemical stress. Humans are considered accidental hosts. They are most often infected when inhaling contaminated dust. Infection by ingestion of contaminated milk may also be possible.

Epidemiological situation in 2011

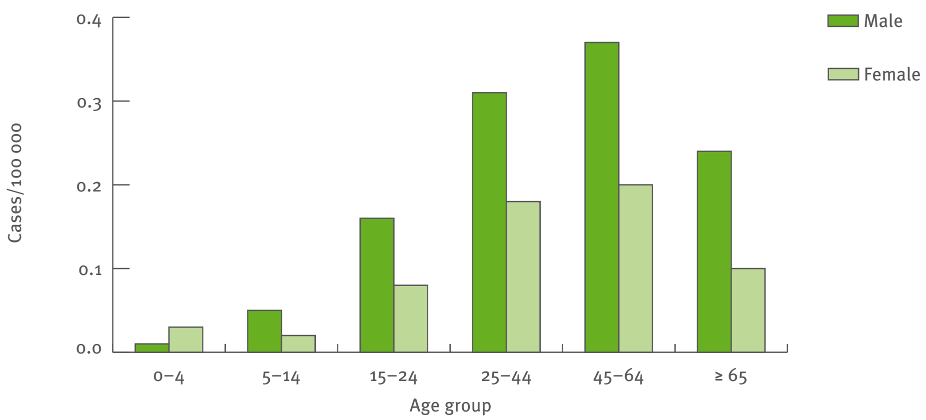
Twenty-four EU/EEA countries reported 766 cases of Q fever in 2011 (nine countries reported zero cases), of which 759 were confirmed (Table 2.4.2). Fifteen countries used the EU case definition. The disease is not notifiable in Austria, Denmark, Italy and Liechtenstein. France and Germany accounted for 67% of the total number of cases reported in 2011. The overall crude confirmed case rate was 0.19 per 100 000 population, nearly half of the 2010 rate. Case numbers decreased in 2011 in all countries reporting more than 10 cases, apart from the United Kingdom; Cyprus seems to face the highest rate and the

Figure 2.4.4. Trend and number of confirmed cases of Q fever reported in the EU/EEA, 2007–2011



Source: Country reports from Cyprus, Estonia, Finland, Germany, Greece, Hungary, Ireland, Lithuania, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia and Sweden.

Figure 2.4.5. Rates of confirmed Q fever cases reported in the EU/EEA, by age and gender, 2011



Source: Country reports from Cyprus, the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Sweden and the United Kingdom.

largest rate increase (0.60 cases per 100 000, despite a very low case number), but the rate is still six times lower than in 2008, when an outbreak occurred. The largest decrease was observed in the Netherlands: 84%, reaching pre-outbreak levels. This confirms the end of the outbreak that lasted from 2007 to 2010. The trend is highlighted in Figure 2.4.4, which shows that the main wave occurred in 2009. As in 2010, two individuals with confirmed disease were reported to have died of Q fever in 2011: a 46-year-old man from the Netherlands and a 79-year-old man from Germany.

Age and gender distribution

In 2011, as in previous years, the highest notification rate of confirmed human Q fever was in the 45–64-year-old age group (0.28 cases per 100 000), followed by 25–44-year-olds (0.25 cases per 100 000). Only 18 of the 758 cases for which information was available were reported among children under the age of 15 (2.4%, same as in 2010). The overall rate was higher for men than women (0.25 and 0.14 per 100 000, respectively), the male-to-female ratio was 1.78:1, which is notably higher than in 2010 (1.56:1) and 2009 (Figure 2.4.5) and comparable to pre-outbreak ratios.

Seasonality

No seasonal pattern is detectable for 2011 cases, only a steady downward trend throughout the year. The average seasonal pattern observed for Q fever shows a slow rise in reported cases in March and April, probably associated with the start of the kidding (goats) and lambing (sheep) seasons. One main peak is seen between May and July, decreasing sharply until August, and lower levels are again observed after October (Figure 2.4.6).

Enhanced surveillance in 2011

Q fever surveillance was not included in the 2011 EU *Summary report on zoonoses, zoonotic agents and food-borne outbreaks*[1].

Table 2.4.2. Numbers and rates of confirmed Q fever cases reported in the EU/EEA, 2007–2011

Country	2011					2010		2009		2008		2007	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Crude rate	Cases	Crude rate	Cases	Crude rate	Cases	Crude rate	Cases	Crude rate
Austria	-	-	-	-	-	-	-	-	-	-	-	-	-
Belgium	N	C	6	6	-	30	-	33	-	27	-	14	-
Bulgaria	Y	A	12	12	0.16	14	0.19	22	0.29	17	0.22	33	0.43
Cyprus	Y	C	5	5	0.60	4	0.49	2	0.25	31	3.93	8	1.03
Czech Republic	Y	C	1	1	0.01	0	0.00	0	0.00	0	0.00	-	-
Denmark	-	-	-	-	-	-	-	-	-	-	-	-	-
Estonia	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Finland	Y	C	4	4	0.07	5	0.09	1	0.02	2	0.04	2	0.04
France	Y	C	228	228	0.35	286	0.44	-	-	-	-	-	-
Germany	Y	C	287	287	0.35	326	0.40	191	0.23	370	0.45	83	0.10
Greece	Y	C	4	3	0.03	1	0.01	3	0.03	3	0.03	0	0.00
Hungary	Y	C	37	36	0.36	68	0.68	19	0.19	11	0.11	7	0.07
Ireland	Y	C	5	4	0.09	9	0.20	17	0.38	10	0.23	4	0.09
Italy	-	-	-	-	-	-	-	-	-	-	-	-	-
Latvia	Y	C	1	1	0.05	2	0.09	0	0.00	1	0.04	0	0.00
Lithuania	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Luxembourg	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	-	-
Malta	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Netherlands	Y	C	80	80	0.48	504	3.04	2 354	14.28	1 039	6.33	132	0.81
Poland	Y	A	0	0	0.00	0	0.00	3	0.01	4	0.01	0	0.00
Portugal	Y	C	9	5	0.05	13	0.12	14	0.13	12	0.11	8	0.08
Romania	Y	C	6	6	0.03	7	0.03	2	0.01	3	0.01	6	0.03
Slovakia	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	1	0.02
Slovenia	Y	C	0	0	0.00	1	0.05	0	0.00	0	0.00	93	4.63
Spain	N	C	33	33	-	69	-	34	-	119	-	159	-
Sweden	Y	C	5	5	0.05	11	0.12	5	0.05	7	0.08	0	0.00
United Kingdom	Y	C	43	43	0.07	30	0.05	19	0.03	56	0.09	62	0.10
EU total	**-**	**-**	**766**	**759**	**0.19**	**1 380**	**0.35**	**2 719**	**0.87**	**1 712**	**0.52**	**612**	**0.15**
Iceland	-	-	-	-	-	0	0.00	0	0.00	0	0.00	-	-
Liechtenstein	-	-	-	-	-	-	-	-	-	0	0.00	-	-
Norway	-	-	-	-	-	-	-	0	0.00	0	0.00	0	0.00
Total	**-**	**-**	**766**	**759**	**0.19**	**1 380**	**0.35**	**2 719**	**0.86**	**1 712**	**0.51**	**612**	**0.15**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

Updates from epidemic intelligence in 2012

No threats related to Q fever were considered in 2011 for the EU/EEA. In the Netherlands, 69 cases of human Q fever were reported in 2012 and one was fatal[2].

Outside the EU, there was a Q fever outbreak in Serbia early in 2012, with 43 cases reported in the village of Nocaj, Srem county, autonomous province of Vojvodina (an endemic region for Q fever with outbreaks also reported in 2009 and 2011[3]). Q fever was laboratory confirmed for 37 notified cases. Atypical pneumonia was predominant and the attack rate was 2%. In Serbia, Q fever has been a notifiable disease since 1966.

Discussion

In the Netherlands the number of cases in 2011 (and 2012) is much smaller than in the preceding years and the outbreak is considered to be over. The specific epidemiology of Q fever was most likely related to intensive dairy goat farming experiencing Q-fever-related abortion waves as early as 2005, in the proximity of densely populated areas in the south of the Netherlands. From 2007 to 2010, more than 4 000 human cases were notified[4–8].

The reduction in the number of human cases is probably due to a combination of the veterinary control measures taken to reduce exposure and weather conditions[9]. Vaccination of animals was shown to reduce bacterial excretion into the environment and thus human exposure. Due to the persistence of *C. burnetii*, vaccination in animals has continued[5,10]. The epidemic resulted in a serious burden of disease, with a hospitalisation rate of 20% of notified cases and is expected to result in more cases of chronic Q fever in the coming years[4].

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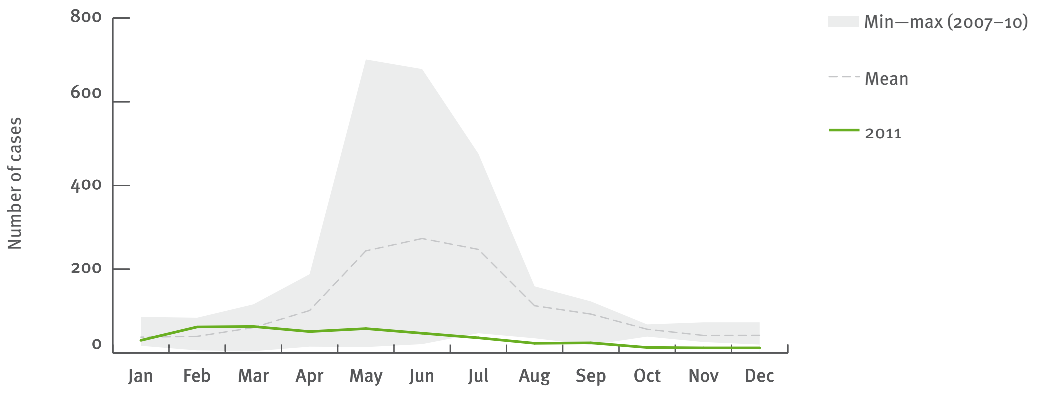
Figure 2.4.6. Seasonal distribution: Number of confirmed cases of Q fever by month, EU/EEA, 2007–2011



Source: Country reports from Cyprus, Estonia, Finland, Germany, Greece, Hungary, Ireland, Lithuania, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia and Sweden.

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by				National coverage	National reference laboratory data	Comparable data available	Case definition used
						Laboratories	Physicians	Hospitals	Others				
Belgium	BE-REFLAB	V	Se	A	C	Y	N	N	N	Y	-	-	Not specified/unknown
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	Y	-	-	EU-2002
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y	-	-	EU-2008
Estonia	EE-VHF	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU case definition (legacy/deprecated)
Finland	FI-NIDR	Cp	Co	P	C	Y	N	N	N	Y	-	-	Not specified/unknown
France	FR-NATIONAL_REFERENCE_CENTRES	V	Co	P	C	Y	N	N	N	-	-	-	Other
Germany	DE-SURVNET@RKI-7.1	Cp	Co	P	C	Y	N	N	Y	Y	-	-	Other
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Hungary	HU-Zoonoses	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Ireland	IE-CIDR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	Y	Y	N	-	Y	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Netherlands	NL-OSIRIS	Cp	Co	P	C	Y	Y	N	Y	Y	-	-	EU-2008
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	N	Y	Y	N	Y	-	-	EU-2008
Portugal	PT-QFEVER	Cp	Co	P	C	N	Y	N	N	Y	-	-	Other
Romania	RO-RNSSy	Cp	Co	P	C	N	N	Y	N	Y	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y	-	-	EU-2008
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Spain	ES-MICROBIOLOGICAL	V	Se	P	C	Y	N	N	N	N	-	-	EU-2008
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
United Kingdom	UK-Q-FEVER	V	Co	P	C	Y	N	Y	Y	Y	-	-	Other

Smallpox

- There were no reports of smallpox or potential smallpox in the EU/EEA countries (or worldwide) in 2011.
- Smallpox is a systemic infectious disease, unique to humans, caused by either of two orthopoxvirus variants, *Variola major* and *Variola minor*. In 1980, the World Health Organization declared smallpox eradicated from the world.

Epidemiological situation in 2011

There were no reports of smallpox or potential smallpox in the EU/EEA countries (or worldwide) in 2011. Twenty-eight EU/EEA countries reported, with the exception of Portugal and Liechtenstein.

Discussion

Mass smallpox vaccination campaigns have ceased after eradication. Hence the population that is immunologically naïve to orthopoxviruses has increased significantly. Smallpox viruses are therefore considered one of the viruses with potential use as a biological weapon. Legitimately, the virus exists in only two WHO reference laboratories in the world. Any new case of smallpox would have to be the result of human accidental or deliberate release.

The World Health Assembly[1] held in May 2011 reaffirmed that the remaining stock of smallpox virus should be destroyed when crucial research on the virus has been completed. Determining a date for destruction of the remaining virus stocks will be discussed at the 67th World Health Assembly in 2014.

The disease clinically and immunologically most similar to smallpox is monkeypox, a zoonosis endemic to moist forested regions in west and central Africa. Smallpox vaccine provided protection against both infections. The recent observation of a surge in human monkeypox in the Democratic Republic of Congo prompts the question of whether cessation of smallpox vaccination is driving the phenomenon. Improved surveillance and epidemiological analysis is needed to better identify the animal reservoirs (such as rodents, squirrels, and monkeys), assess the public health burden and develop strategies for reducing the risk of wider spread of monkeypox infection[2,3].

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Viral haemorrhagic fevers

A number of diseases are included under the heading 'viral haemorrhagic fevers' (VHFs), with differences in type of virus, geographical distribution, incidence, reservoir, means of transmission and clinical symptoms. The common denominator is the possible emergence of a disease with general bleeding – often leading to death. Another common feature is the potential risk that such patients might pose to close contacts and to healthcare and laboratory personnel until a firm diagnosis is established. Fortunately, most of these viruses do not transmit easily (with the exception of yellow fever virus, chikungunya and dengue virus, which are spread by infected mosquitoes).

Present in Europe are Hantaan and Puumula VHF, also called 'epidemic nephropathy' (transmitted through direct/indirect exposure to infected rodents) and Crimean–Congo VHF (transmitted through tick bites). Others are mainly seen as imported infections, such as Lassa fever (transmitted by rodents) and dengue haemorrhagic fever (transmitted through mosquito bites), Ebola and Marburg fever (monkey-associated). Yellow fever is described at the end of this section.

Hantavirus

- In 2011, 2 923 cases of hantavirus infection were reported from 24 countries; 30% fewer than reported in 2010 (4 200 cases reported by 23 countries).
- Of the diseases that have potential haemorrhagic features, it is the most commonly reported disease in the EU/EEA region.

Hantaviruses in Europe cause haemorrhagic fever with renal syndrome. Humans get infected by inhalation of dust contaminated by excreta of infected rodents.

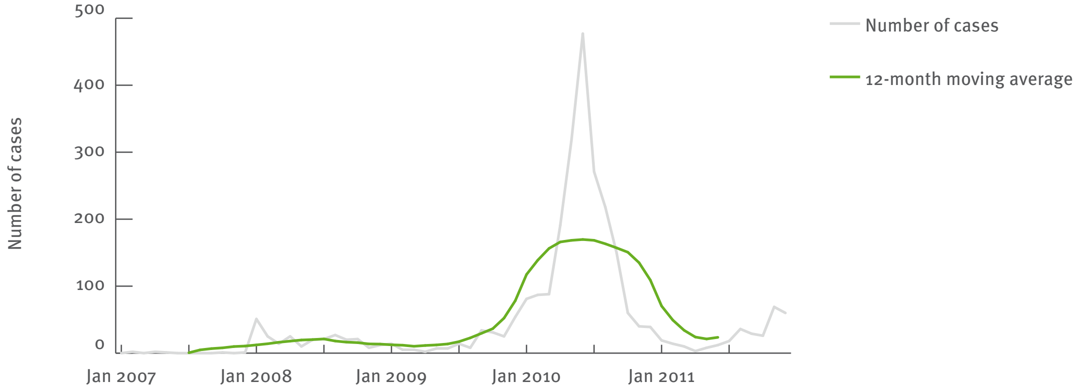
Epidemiological situation in 2011

In 2011, 2 923 cases (2 901 of which were confirmed) were reported by 24 EU/EEA countries (Table 2.4.3); eight countries reported no cases. Data were not available from Cyprus, Denmark, Italy, Portugal, Iceland and Liechtenstein. Numbers for 2011 show a 30.5% decrease from 2010 when 4 200 cases (4 196 confirmed cases) were recorded. The overall case rate was 0.65 per 100 000 population, which is quite similar to the rate reported in 2009 (0.65), but lower than the rate in 2010 (1.13) and the peak in 2008 (1.24). The rate varied from 0.02 in Poland and Romania to 34.12 in Finland. Most of the cases are reported from just four countries (Finland, Germany, Sweden and Belgium), accounting for 91.4% of all cases compared with 97.3% in 2010, 95.0% in 2009, and 97.1% in 2008.

The case rate of 34.12 reported in Finland was higher than in 2010 (26.97), quite similar to 2009 (36.18) and much lower than in 2008 (61.49). Germany, with a rate of 0.37, saw a considerable decrease compared with 2010 (2.47) but the rate is slightly higher than in 2009 and 2008 (0.22 and 0.30, respectively). Sweden showed a lower case rate in 2011 (3.73) than in 2010 (4.45) or 2008 (6.20) but higher than in 2009 (0.57).

Information about the source of infection was not available. Eight cases of hantavirus infection have been identified as imported cases (four in Germany, two in Sweden, one in Estonia and one in Norway). However, for 75.2% of cases the status was not specified.

Figure 2.4.7. Trend and number of cases of hantavirus infections reported in the EU/EEA, 2008–2011



Source: Country reports from Austria, Bulgaria, Estonia, Finland, Germany, Greece, Hungary, Ireland, Lithuania, Malta, the Netherlands, Norway, Poland, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Over the past five years, two waves of increased numbers of hantavirus infection have been perceptible at the EU level: the first between August 2008 and February 2009, dominated by the Finnish data, and the second between April 2010 and January 2011, reflecting the situation in Germany (Figure 2.4.7).

Age and gender distribution

Hantavirus infections are predominantly reported in adults, with 75% of cases in the age groups 25–64 years. The highest incidence is observed in the 45–64-year-old group (1.03 per 100 000 population, versus 1.98 in 2010 and 1.28 in 2009), followed by the 25–44-year-olds (0.77 per 100 000 population, versus 0.95 in 2009). A few cases are reported in children (2.2% of the cases), with a case rate of 0.01 per 100 000 in the 0–4 year age group and 0.13 per 100 000 population for the 5–14-year-olds.

The incidence is higher among males (0.83 per 100 000 population, 0.92 in 2009) than females (0.48 per 100 000 population, 0.65 in 2009) and the male-to-female ratio is 1.72:1 (versus 1.93:1 in 2010, and 1.41:1 in 2009) (Figure 2.4.8).

Seasonality

Cases were reported all year round, with an increase in November–December (25% of the cases were reported during these two months in 2011). The lowest numbers of cases were reported from February to April. The reporting of high numbers of cases in November–December in several countries other than Finland (Germany, Belgium and France) was an unusual occurence.

Discussion

Hantavirus infections cause haemorrhagic fever with renal syndrome in Eurasia, and hantavirus pulmonary syndrome in the Americas. However, in some severe cases in Europe respiratory distress can be observed. Haemorrhagic fever with renal syndrome is caused by different hantaviruses, mostly Puumala virus (PUUV) carried by bank voles and Dobrava-Belgrade virus (DOBV) carried by yellow-necked mice. Epidemics which occur locally may be linked to favourable environmental conditions in terms of food supplies, which leads to an increase of rodent carrier populations and contacts of the human population with the virus. About

Table 2.4.3. Numbers and rates of hantavirus infection cases reported in the EU/EEA, 2008–2011

Country	2011					2010		2009		2008	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Crude rate	Cases	Crude rate	Cases	Crude rate	Cases	Crude rate
Austria	Y	C	36	15	0.43	31	0.37	29	0.35	1	0.01
Belgium	N	C	190	190	-	212	-	187	-	336	-
Bulgaria	Y	A	3	2	0.04	3	0.04	2	0.07	2	0.05
Cyprus	-	-	-	-	-	-	-	-	-	-	-
Czech Republic	Y	C	9	9	0.09	8	0.08	6	0.06	-	-
Denmark	-	-	-	-	-	-	-	-	-	-	-
Estonia	Y	C	12	12	0.90	5	0.37	17	1.27	11	0.82
Finland	Y	C	1834	1834	34.12	1443	26.97	1927	36.18	3259	61.49
France	Y	C	101	101	0.16	-	-	-	-	-	-
Germany	Y	C	305	305	0.37	2016	2.46	181	0.22	243	0.30
Greece	Y	C	0	0	0.00	0	0.01	2	0.02	2	0.02
Hungary	Y	C	7	7	0.07	11	0.11	11	0.11	3	0.03
Ireland	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00
Italy	-	-	-	-	-	-	-	-	-	-	-
Latvia	Y	C	4	4	0.18	4	0.18	1	0.04	1	0.04
Lithuania	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00
Luxembourg	Y	C	0	0	0.00	0	0.00	1	0.20	0	0.00
Malta	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00
Netherlands	Y	C	0	0	0.00	0	0.00	1	0.05	0	0.00
Poland	Y	C	8	8	0.02	4	0.02	4	0.01	0	0.02
Portugal	-	-	-	-	-	-	-	-	-	-	-
Romania	Y	C	4	4	0.02	4	0.02	8	0.04	4	0.02
Slovakia	Y	C	3	3	0.06	1	0.02	3	0.06	1	0.02
Slovenia	Y	C	17	17	0.83	17	0.83	5	0.25	45	2.24
Spain	Y	C	0	0	0.00	0	0.00	0	0.00	2	0.00
Sweden	Y	C	351	351	3.73	416	4.45	53	0.57	569	6.20
United Kingdom	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00
EU total	**-**	**-**	**2884**	**2862**	**0.65**	**4175**	**1.14**	**2438**	**0.65**	**4479**	**1.24**
Iceland	-	-	-	-	-	-	-	-	-	-	-
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	39	39	0.79	21	0.43	21	0.44	50	1.06
Total	**-**	**-**	**2923**	**2901**	**0.65**	**4196**	**1.13**	**2459**	**0.65**	**4529**	**1.23**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

5% of hospitalised PUUV and 16–48% of DOBV patients require dialysis and some prolonged intensive-care treatment[1]. No vaccine or specific therapy is in general use in Europe.

Hantavirus infections are widely distributed across Europe, with the exception of some Mediterranean countries. There seem to be large regional differences in the incidence, and the disease is particularly prevalent in northern Europe (Finland)[1]. There are at present no indicators to suggest whether or not there is a real increase in hantavirus cases in Europe. Germany did not report an unusual outbreak situation like the major one it faced in 2010 in the south of the country[2]. Further studies are needed to elucidate the population dynamics and hantavirus prevalence in the rodent reservoir and the driving ecological factors[3].

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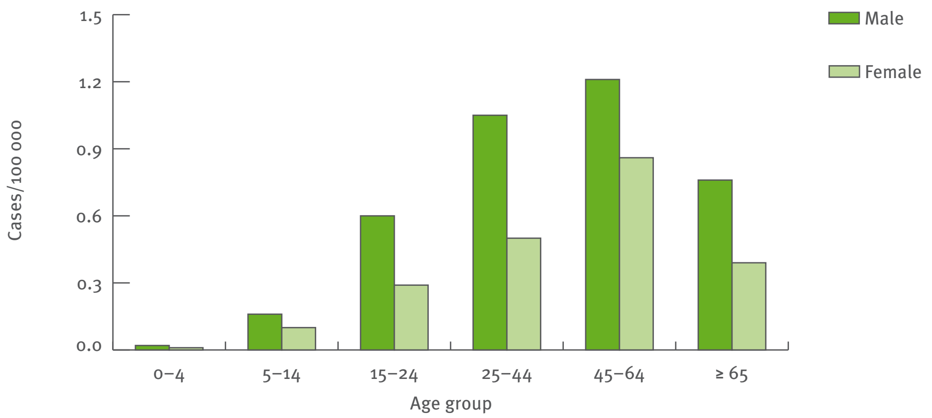
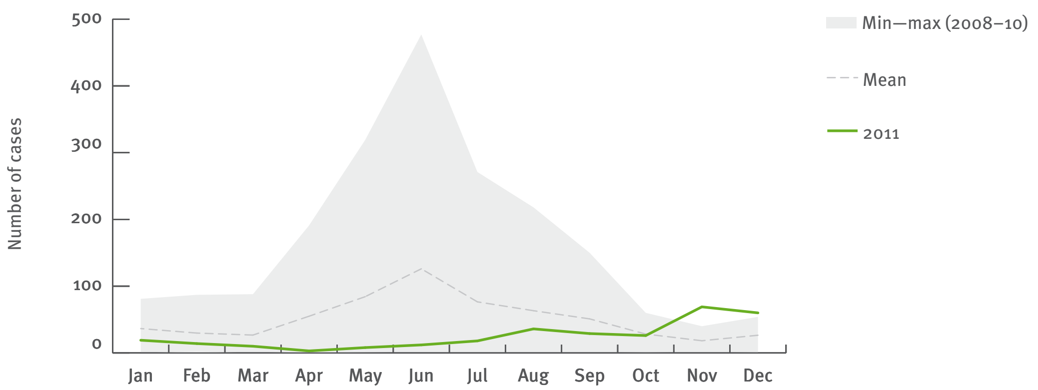
Figure 2.4.8. Rates of hantavirus cases reported in the EU/EEA, by age and gender, 2011



Source: Country reports from Austria, Belgium, Bulgaria, the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Figure 2.4.9. Seasonal distribution: Number of hantavirus infection cases reported in the EU/EEA by month, 2008–2011



Source: Country reports from Austria, Bulgaria, Estonia, Finland, Germany, Greece, Hungary, Ireland, Lithuania, Malta, the Netherlands, Norway, Poland, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by				National coverage
						Laboratories	Physicians	Hospitals	Others	
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	Y
Belgium	BE-LABNET	V	Se	A	C	Y	N	-	-	Y
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	Y
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y
Estonia	EE-VHF	Cp	Co	P	C	Y	Y	Y	Y	Y
Finland	FI-NIDR	Cp	Co	P	C	Y	N	N	N	Y
France	FR-NATIONAL_REFERENCE_CENTRES	V	Co	P	C	Y	N	N	N	-
Germany	DE-SURVNET@RKI-7.1/6	Cp	Co	P	C	Y	Y	Y	Y	Y
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y
Hungary	HU-EFRIR	Cp	Co	P	C	Y	Y	Y	N	Y
Ireland	IE-NVRL	V	Co	P	C	Y	N	N	N	Y
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	Y	Y	N	-	Y
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	N	Y
Netherlands	NL-OSIRIS	Cp	Co	P	C	Y	Y	N	N	Y
Norway	NO-MSIS_A	-	-	-	-	-	-	-	-	Y
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	N	Y	Y	N	Y
Romania	RO-RNSSy	Cp	Co	P	C	N	N	Y	N	Y
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y
Spain	ES-NRL	Cp	Co	P	C	Y	Y	Y	N	Y
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y
United Kingdom	UK-HANTAVIRUS	V	Co	A	C	Y	N	Y	Y	Y

Crimean–Congo haemorrhagic fever

Crimean–Congo haemorrhagic fever (CCHF) is a tick-borne viral disease with symptoms such as high fever, muscle pain, dizziness, abnormal sensitivity to light, abdominal pain and vomiting. Later on, sharp mood swings may occur, and the patient may become confused and aggressive. CCHF virus is widespread and evidence for the virus has been found among ticks in Africa, Asia, the Middle East, and eastern and south-western Europe. In Europe cases of human infection have been reported from Albania, Armenia, Bulgaria, Kazakhstan, Kosovo[i], Russia, Serbia, Tajikistan, Turkey, Turkmenistan, Ukraine, and Uzbekistan.

Epidemiological situation in 2011

Data were reported from 23 EU/EEA countries, with the exception of Cyprus, Denmark, Estonia, Finland, Germany, Portugal and Liechtenstein. Fourteen EU countries refer to the EU case definition (which is generic for all viral haemorrhagic fever cases).

One confirmed case and three probable cases of CCHF were reported in 2011 from Bulgaria. These four cases (one man between 45 and 49 years of age, two men over 60, and one woman over 60) were notified in June and July (onset of disease in May–July).

Updates from epidemic intelligence in 2012

In October 2012, one imported (fatal) case of CCHF was diagnosed in the United Kingdom. The patient travelled on commercial flights from Kabul, Afghanistan via Dubai to London, and had had fever and other symptoms for four days prior to hospitalisation, which led to extensive contact-tracing and follow-up[1].

Discussion

Crimean–Congo haemorrhagic fever is endemic in the Balkan region and a few cases are reported on a regular basis from Bulgaria (six cases in 2010, eight cases in 2009, and 14 cases in 2008). In the wider European region, Turkey remains the most affected country with 1075 cases and 54 deaths notified in 2011 (case–fatality rate 5.0%) (Gulay Korukluoglu, personal communication). Romania recently reported some initial serological evidence for the circulation of the virus among sheep in the south-eastern area (county of Tulcea, Northern Dobrogea)[2]. The current distribution of one major vector for CCHF, the tick *Hyalomma marginatum*, has been

i This designation is without prejudice to positions on status, and is in line with UNSCR 1244/99 and the ICJ Opinion on the Kosovo declaration of independence.

displayed on the ECDC website since 2012, showing a wide distribution[3].

Crimean–Congo haemorrhagic fever has the potential for human-to-human transmission and early detection of cases (clinically and in the laboratory) is essential for the implementation of timely appropriate protective measures and instigation of treatment[4].

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Dengue fever

- A total of 610 cases of dengue fever were notified by EU/EEA countries in 2011.
- The number of reported dengue fever cases in 2011 is much lower than the number reported in 2010 and compares to 2009.
- An outbreak of autochthonous dengue started in October 2012 in Madeira, with more than 2000 reported cases.

Dengue is a mosquito-borne disease in humans, caused by a virus of the Flaviviridae family. Dengue fever is transmitted through bites of Aedes mosquitoes and widely spread in Asia, the Pacific, the Caribbean, the Americas and Africa. Dengue fever is one of the most prevalent vector-borne diseases in the world, affecting an estimated 50–100 million people each year. While most of the clinical cases present a febrile illness, severe forms including haemorrhagic fevers and shock with fatalities are reported. No specific treatment or vaccine exists for dengue, and general intensive care is often needed[1–3].

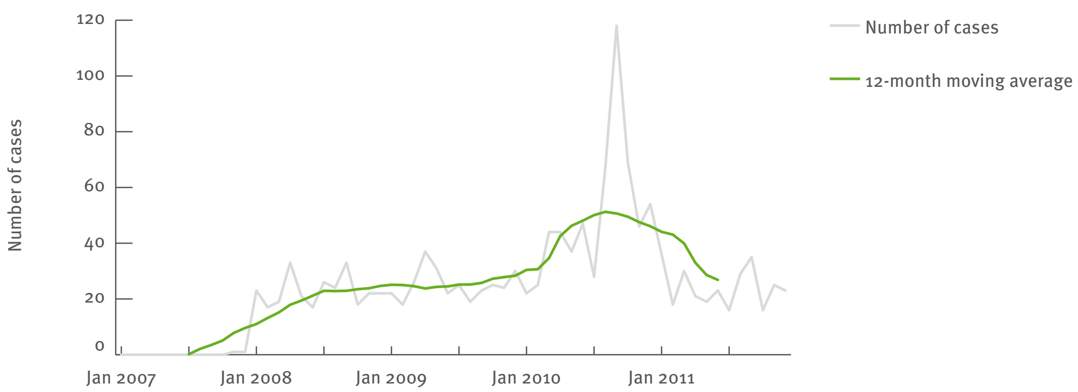
Epidemiological situation in 2011

In 2011, a total of 610 cases of dengue fever (560 of which were confirmed) were reported by 14 of 22 reporting EU/EEA countries. The disease is not notifiable in Bulgaria, Cyprus, Denmark, Estonia, the Netherlands, Portugal, Liechtenstein and Norway. Only about a third of the number of cases reported in 2010 were reported in 2011, bringing numbers almost back to 2009 levels; a 10-fold decrease was observed in France. Germany reported the highest numbers, followed by Sweden (Table 2.4.4 and Figure 2.4.10).

Data for dengue reported within the EU are very heterogeneous as no specific case definition for dengue is available yet. Eleven countries referred to the 2008 EU generic case definition for all viral haemorrhagic fevers. Some countries appear to have reported all diagnosed dengue cases, including dengue fever cases and severe dengue cases; other countries reported only cases with haemorrhages and/or hospitalised cases. Some 91.5% of the cases were reported as imported and the others were of unknown origin.

The overall case rate was 0.13 per 100 000 (0.35 per 100 000 in 2010), similar to 2009 or 2008 rates. The individual country rates varied between 0.00 and 1.09 cases per 100 000 population. The higher rates reported by Sweden (1.09 per 100 000) and Finland (0.84 per 100 000) reflect predominant choices of travel destinations to countries where dengue fever is endemic, and the intensity of dengue transmission in 2011 worldwide.

Figure 2.4.10. Trend and number of dengue cases reported in the EU/EEA, 2008–2011



Source: Country reports from Austria, the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Lithuania, Malta, Poland, Slovakia, Slovenia, Spain, Sweden.

Age and gender distribution

The case rate was similar in males (0.16 cases per 100 000) and females (0.11 per 100 000), with a male-to-female ratio of 1.4:1. The age groups with the highest rates were the 15–24- and 25–44-year-olds (with 0.18 and 0.21 cases per 100 000, respectively) (Figure 2.4.11). The age and gender distribution is most likely related to preferences for travel to tropical countries among these age groups.

Seasonality

A clear seasonal trend in monthly reports is observed across all countries, with cases increasing during the summer months June–October, peaking in August. The peak in 2011 occurred in September, one month later than in the years before 2011 (Figure 2.4.12).

Updates from epidemic intelligence in 2012

ECDC monitors individual outbreaks, seasonal transmission patterns and inter-annual epidemic cycles of dengue throughout the world through epidemic intelligence activities in order to identify significant changes in disease epidemiology. Of particular concern is the potential for the establishment of dengue transmission in European countries where the competent vectors are present.

There have been no reports of confirmed autochthonous dengue infections in continental Europe in 2012, besides the ongoing dengue outbreak in Madeira (see below). Continuously high activity was reported in Latin America, and increasing numbers of cases were reported from across Central America and the Caribbean.

The island of Madeira in the Autonomous Region of Madeira, Portugal, located around 400 km from the Canary Islands, 650 km from the African coast, and 1 000 km from the European continent, experienced an outbreak of autochthonous dengue starting in September 2012[4]. Over 2 000 cases of dengue infection have been reported (without severe cases or deaths), due to a DENV-1 virus similar to those circulating in Venezuela and Colombia in recent years[5]. In addition, nearly 80 patients have been detected in other European countries after returning from Madeira. The island of Madeira has

Table 2.4.4. Numbers and rates of dengue fever cases reported in the EU/EEA, 2008–2011

Country	2011					2010		2009		2008	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Crude rate	Cases	Crude rate	Cases	Crude rate	Cases	Crude rate
Austria	Y	A	0	0	0.00	11	0.13	0	0.00	0	0.00
Belgium	Y	A	41	41	0.37	129	1.19	53	0.49	60	0.56
Bulgaria	-	-	-	-	-	-	-	-	-	-	-
Cyprus	-	-	-	-	-	-	-	-	-	-	-
Czech Republic	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00
Denmark	-	-	-	-	-	-	-	-	-	-	-
Estonia	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00
Finland	Y	C	45	45	0.84	50	0.93	35	0.66	35	0.66
France	Y	C	55	11	0.09	125	0.92	13	0.10	15	0.09
Germany	Y	C	288	288	0.35	595	0.73	298	0.36	273	0.33
Greece	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00
Hungary	Y	C	2	2	0.02	6	0.07	1	0.01	6	0.06
Ireland	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00
Italy	Y	C	44	44	0.07	51	0.09	10	0.02	12	0.02
Latvia	Y	C	2	2	0.09	8	0.36	1	0.04	0	0.00
Lithuania	Y	C	1	1	0.03	0	0.00	0	0.00	0	0.00
Luxembourg	Y	C	1	1	0.20	2	0.40	0	0.00	0	0.00
Malta	Y	C	0	0	0.00	0	0.24	0	0.00	0	0.00
Netherlands	-	-	-	-	-	-	-	-	-	-	-
Poland	Y	C	5	0	0.01	0	0.02	0	0.01	0	0.01
Portugal	-	-	-	-	-	-	-	-	-	-	-
Romania	Y	C	2	2	0.01	0	0.00	0	0.00	1	0.01
Slovakia	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00
Slovenia	Y	C	8	7	0.39	8	0.39	4	0.20	6	0.30
Spain	Y	C	0	0	0.00	0	0.00	4	0.01	0	0.00
Sweden	Y	C	103	103	1.09	151	1.62	100	1.08	73	0.80
United Kingdom	Y	C	13	13	0.02	7	0.01	3	0.01	6	0.01
EU total	**-**	**-**	**610**	**560**	**0.13**	**1143**	**0.35**	**522**	**0.13**	**487**	**0.12**
Iceland	Y	C	0	0	0.00	0	0.00	0	0.00	-	-
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-
Norway	-	-	-	-	-	-	-	-	-	-	-
Total	**-**	**-**	**610**	**560**	**0.13**	**1143**	**0.35**	**522**	**0.13**	**487**	**0.12**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

an established mosquito population of *Aedes aegypti*, the main vector of dengue in tropical and subtropical countries. Cases continued to occur during the winter, though at a much lower level. This is indicative of uninterrupted transmission occurring since the start of the outbreak and continuous vector activity. ECDC published an updated rapid risk assessment concerning the autochthonous dengue cases in Madeira. Portuguese authorities published recommendations regarding personal protective measures, and measures for the safety of blood, cells, tissues and organ donations within the region. Blood donor deferral for 28 days from day of departure for travellers returning from the Autonomous Region of Madeira is now recommended in other EU countries.

Discussion

Travel-related dengue fever in the EU peaked in 2010, reflecting the intense dengue situation in tropical regions where the disease is endemic; the situation returned to a lower level in 2011[1–3,6].

Local transmission of dengue was reported for the first time in France and Croatia in 2010, before the current outbreak in the Autonomous Region of Madeira[4]. Imported cases were detected in other European countries. In places where the *Aedes* vectors are established and where conditions are suitable for transmission (like in many Mediterranean countries of the EU), imported viraemic patients could lead to locally acquired cases. Increased surveillance of dengue and its *Aedes* vectors is needed, as well as vigilance among health professionals.

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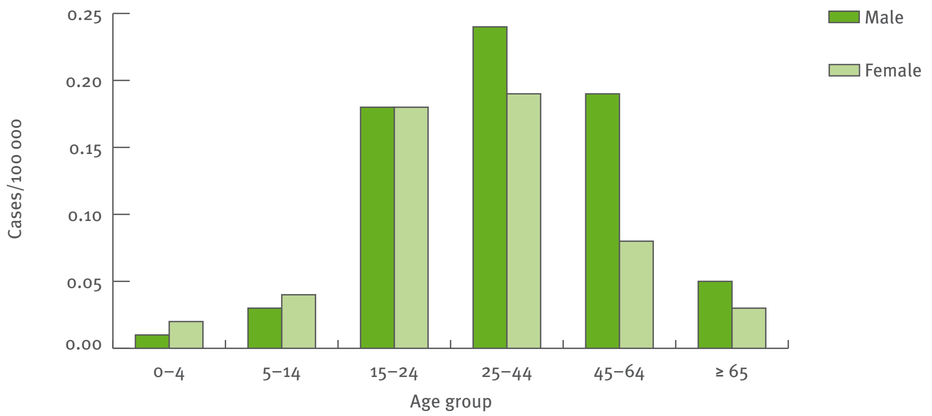
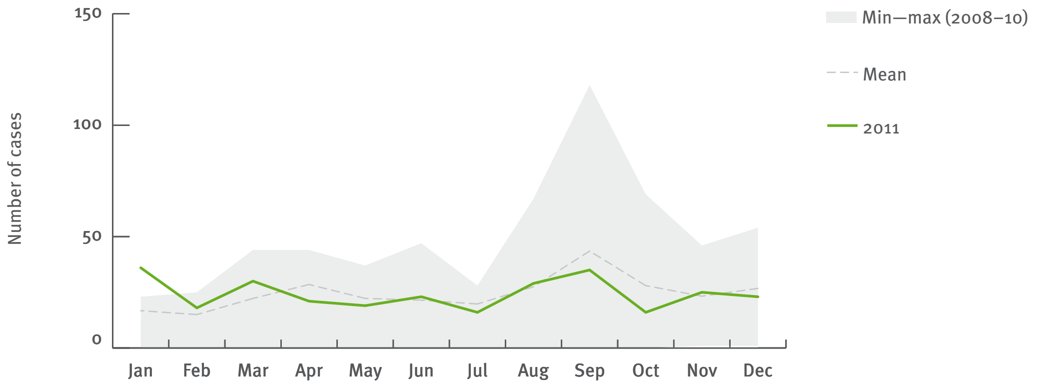
Figure 2.4.11. Rates of dengue fever cases reported in the EU/EEA, by age and gender, 2011



Source: Country reports from the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Poland, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Figure 2.4.12. Seasonal distribution: Number of cases of dengue fever by month, EU/EEA, 2008–2011



Source: Country reports from Austria, the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Lithuania, Malta, Poland, Slovakia, Slovenia, Spain and Sweden.

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by				National coverage
						Laboratories	Physicians	Hospitals	Others	
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	Y
Belgium	BE-REFLAB	V	Co	A	A	Y	N	N	N	Y
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y
Estonia	EE-VHF	Cp	Co	P	C	Y	Y	Y	Y	Y
Finland	FI-NIDR	Cp	Co	P	C	Y	N	N	N	Y
France	FR-MANDATORY_INFECTIOUS_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y
Germany	DE-SURVNET@RKI-7.1/6	Cp	Co	P	C	Y	Y	Y	Y	Y
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y
Hungary	HU-EFRIR	Cp	Co	P	C	Y	Y	Y	N	Y
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	N	-
Ireland	IE-NVRL	V	Co	P	C	Y	N	N	N	Y
Italy	IT-NRS	Cp	Co	P	C	N	Y	Y	N	Y
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	Y	Y	N	-	Y
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	N	Y
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	N	Y	Y	N	Y
Romania	RO-RNSSy	Cp	Co	P	C	Y	N	Y	N	Y
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y
Spain	ES-STATUTORY_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y
United Kingdom	UK-DENGUE	V	Co	A	C	Y	N	Y	Y	Y

Rift Valley fever

Rift Valley fever (RVF) is an acute viral disease that affects mainly domestic animals (such as cattle, buffalo, sheep, goats, and camels). The disease is caused by the RVF virus, generally found in regions of eastern and southern Africa, but also in most countries of sub-Saharan Africa, Madagascar, Saudi Arabia and Yemen. Humans may become infected through direct or indirect contact with the blood or organs of infected animals. While most human cases are relatively mild (influenza-like illness), a small percentage of patients develop a much more severe form of the disease, with haemorrhagic manifestations and hepatitis.

Epidemiological situation in 2011

No imported cases of RVF were reported from 18 EU/EEA countries (Austria, Bulgaria, Cyprus, Denmark, Estonia, Finland, Ireland, the Netherlands, Poland, Portugal, Iceland and Liechtenstein do not report). The EU case definition for RVF is generic for all viral haemorrhagic fevers.

One ProMED report mentioned the detection of RVF IgM and IgG antibodies in a blood specimen from a young woman in France in September 2011. The woman, who was returning from a trip to north-eastern Zimbabwe from July to mid-August 2011, experienced a febrile illness shortly after her return[1].

Updates from epidemic intelligence in 2012

An outbreak of RVF was reported from six regions in Mauritania between mid-September and the end of October 2012, with 34 cases, including 17 deaths. Cases had a history of direct contact with animals. A multisectorial task force was established to strengthen epidemiological surveillance in both human and animal health, strengthen capacity in case management at healthcare facilities, strengthen health measures in slaughterhouses, and raise awareness among farmers. Mauritania periodically experiences RVF outbreaks, the last one having been reported in 2010[2].

Discussion

Rift Valley fever is a viral mosquito-borne zoonotic disease endemic in sub-Saharan African countries, which also extended into Egypt, Comoros and Madagascar in the Indian Ocean, and the Arabian peninsula (Saudi Arabia and Yemen). The disease disproportionately affects vulnerable communities with poor resilience to disease, due to economic and environmental challenges.

Outbreaks of RVF were reported in 2008–2011 in South Africa[3]. The spatiotemporal analysis of these outbreaks supports the hypothesis that disease spread may be supported by factors other than active vector dispersal[4]. Namibia, having experienced outbreaks in 2010, also reported cases in the northern part of the country in June 2011[5].

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Ebola and Marburg fevers

Ebola and Marburg haemorrhagic fevers are caused by the Ebola and Marburg viruses, respectively, both belonging to the same Filovirus family. Both are rare diseases, but have the potential to cause high death rates. Transmission of the viruses occurs from person to person through close contact with blood or bodily fluids, but also through contact to infected animals (monkeys, chimpanzees, forest antelopes, bats, or other animals). Clinical illness starts as a flu-like syndrome, rapidly evolving to severe disease with bleedings. No treatment or vaccine is available for either disease.

Epidemiological situation in 2011

No imported cases have been reported in continental Europe in 2011 according to reports from 26 EU/EEA countries; no reports were available from Cyprus, Denmark, Portugal and Liechtenstein. Fifteen EU countries refer to the EU case definition (which is generic for all viral haemorrhagic fevers).

Updates from epidemic intelligence in 2012

In 2012 several outbreaks were reported in Central Africa, in the Democratic Republic of Congo and in Uganda. In the Democratic Republic of Congo one outbreak due to Bundibugyo Ebolavirus was reported in North-East Orientale province in mid-August, which ended in October, with 62 probable/confirmed cases including 34 deaths (including healthcare workers). In Uganda, one outbreak of Marburg was reported in September–October in Kbalae/Ibanda, with spread to Kampala and Mbarara districts, with 20 cases including several deaths. Two Ebola outbreaks also occurred in 2012: one due to Sudan Ebolavirus in Kibale with 24 cases (11 confirmed and 13 probable) and 17 deaths (case–fatality rate 70.8%), which ended in August, and one in Luwero and Kampala districts with seven cases (six confirmed and one probable) in November.

Discussion

The diseases described here are due to viruses from the family Filoviridae with two distinct genera, *Ebolavirus* and *Marburgvirus*. The *Ebolavirus* genus comprises five distinct species designated as *Cote d'Ivoire Ebolavirus*, *Reston Ebolavirus*, *Sudan Ebolavirus*, and *Zaire Ebolavirus*. Filoviruses are endemic in Central Africa. The Zaire, Sudan and Bundibugyo Ebolavirus species have been associated with large Ebola haemorrhagic fever outbreaks in Africa with a high case–fatality rate (25–90%). In 2011, there had been a limited outbreak due to Sudan Ebolavirus in Uganda (Luwero district)[1], which flared up again in 2012 (see above). Reston Ebolavirus can infect humans, but no serious illness or death in humans has been reported to date; it is circulating in Asia.

Guidelines for contact-tracing cases of Ebola or Marburg haemorrhagic fever on aeroplanes have been developed by ECDC[2].

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Lassa fever

Lassa fever is an acute viral illness that occurs in West Africa from Guinea to Nigeria. The viral aetiology of the disease was identified in 1969, and the name refers to the place where the cases originated from in Nigeria. The reservoir of Lassa virus is a rodent known as the multimammate rat of the *Mastomys* genus.

Humans become infected through contact with the excreta of infected rats. While about 80% of the infections present no symptoms, the remaining patients develop severe multi-system disease and up to 15% of the hospitalised cases may die. Lassa fever is also associated with occasional epidemics (including nosocomial transmission) during which the case–fatality rate can reach 50%. Early treatment with the antiviral drug ribavirin is effective, and infection is prevented by pratising good hygiene.

Epidemiological situation in 2011

No cases of Lassa fever were reported in the EU in 2011. Data were obtained from 24 EU/EEA countries. Thirteen EU countries refer to the EU case definition (which is generic for all viral haemorrhagic fevers).

Discussion

As for Ebola and Marburg viruses, Lassa fever infection remains a rare importation risk for EU countries, which requires contact-tracing and monitoring of contacts of the patient, including healthcare staff. The ECDC guidelines for contact-tracing cases of Ebola or Marburg haemorrhagic fever on aeroplanes are also applicable for Lassa fever[3].

There are no vaccines available for humans for Lassa fever, but some candidates are under trial in monkey models[1]. In Argentina there is a live attenuated vaccine (Candid-1) against another Arenavirus, Junin fever, which is manufactured locally and available for those at risk of exposure[2]. Other Arenaviruses inducing viral haemorrhagic fevers in humans are Lujo in Africa, Machupo (Bolivia), Guanarito (Venezuela), and Junin (Argentina) in South America, each virus circulating in specific areas in each country. Outbreaks of Guanarito fever (Venezuelan haemorrhagic fever) and an outbreak of Machupo fever (Bolivian haemorrhagic fever) were reported locally in 2011.

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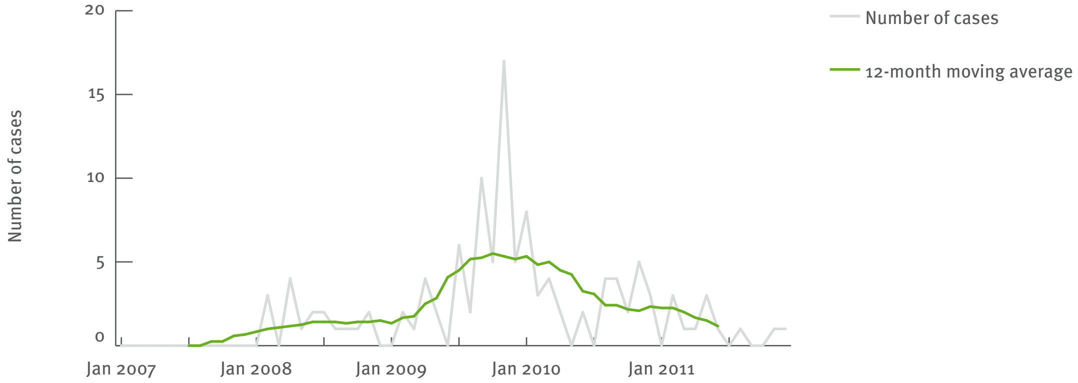
Chikungunya fever

- There were 55 cases of chikungunya fever, of which 41 were confirmed, notified by EU/EEA countries in 2011.
- Case numbers are much lower than in 2009 and 2010.
- No cases of locally acquired chikungunya fever were reported in the EU in 2011.

In 2011, 55 cases of chikungunya fever, of which 41 were confirmed, were reported by seven of 22 EU/EEA countries (Table 2.4.5). No data were available from Bulgaria, Cyprus, Denmark, the Netherlands, Portugal, Iceland, Liechtenstein or Norway. Cases were reported by Austria, Belgium, France, Germany, Italy, Spain and the United Kingdom. The highest rate (0.07 per 100 000 inhabitants) was reported by Belgium. All cases were reported as being imported, mostly from India, but also Africa and Asia. Case numbers were lower than in 2010

Figure 2.4.13. Trend and number of confirmed cases of chikungunya fever reported in the EU/EEA, 2008–2011



Source: Country reports from Austria, the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Poland, Romania, Slovakia, Slovenia and the United Kingdom.

and 2009 (about one third); this is highlighted in Figure 2.4.13.

Age and gender distribution

The reported rate is higher for females than for males (0.01 and 0.02 per 100 000, respectively). Case rates are highest in the age group 45–64 years (0.02 cases per 100 000) (Figure 2.4.14).

Seasonality

In previous years, cases were mainly reported in April, September and November; in 2011 the peak was in July, but the seasonality is not obvious and cases occur throughout the year (Figure 2.4.15).

Updates from epidemic intelligence in 2012

ECDC monitors reports of chikungunya outbreaks worldwide through epidemic intelligence activities in order to identify significant changes in disease epidemiology. Chikungunya, a viral disease transmitted mainly by *Aedes albopictus* and *Aedes aegypti*, has the potential to be established in the EU, due to the presence of these vectors in southern parts of Europe.

No autochthonous cases were reported in 2012 in Europe, and with the exception of Papua New Guinea which reported its first local outbreak, no new outbreaks were detected in the rest of the world.

Discussion

Reported case numbers of chikungunya are lower than in 2010 and 2009. Reported rates were highest among 45–64 year age group. Outside continental Europe, some European territories are endemic for chikungunya, others experienced their first cases (like New Caledonia in 2011), but data are not collected through the European Surveillance System.

The first identified outbreak of chikungunya fever in a temperate climate (Italy) in 2007 demonstrated the potential of the *Aedes albopictus* mosquito to transmit the virus at EU latitudes[1]. In 2010, indigenous transmission was reported for the second time in Europe with the first two indigenous cases identified through enhanced

Table 2.4.5. Numbers and rates of chikungunya fever cases reported in the EU/EEA, 2008–2011

Country	2011					2010		2009		2008	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Crude rate	Cases	Crude rate	Cases	Crude rate	Cases	Crude rate
Austria	Y	C	2	0	0.02	2	0.02	8	0.10	0	0.00
Belgium	Y	A	8	8	0.07	8	0.07	6	0.06	0	0.00
Bulgaria	-	-	-	-	-	-	-	-	-	-	-
Cyprus	-	-	-	-	-	-	-	-	-	-	-
Czech Republic	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00
Denmark	-	-	-	-	-	-	-	-	-	-	-
Estonia	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00
Finland	Y	C	0	0	0.00	1	0.02	3	0.06	0	0.00
France	Y	C	12	12	0.02	0	0.07	13	0.02	1	0.00
Germany	Y	C	13	13	0.02	37	0.05	54	0.07	17	0.02
Greece	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00
Hungary	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00
Ireland	Y	C	0	0	0.00	1	0.02	0	0.00	0	0.00
Italy	Y	C	2	2	0.00	7	0.01	2	0.01	1	0.02
Latvia	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00
Lithuania	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00
Luxembourg	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00
Malta	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00
Netherlands	-	-	-	-	-	-	-	-	-	-	-
Poland	Y	A	0	0	0.00	0	0.00	0	0.00	0	0.00
Portugal	-	-	-	-	-	-	-	-	-	-	-
Romania	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00
Slovakia	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00
Slovenia	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00
Spain	N	C	4	4	-	0	-	6	-	5	-
Sweden	Y	C	0	0	0.00	0	0.00	0	0.00	-	-
United Kingdom	Y	C	14	2	0.02	0	0.13	8	0.09	1	0.02
EU total	**-**	**-**	**55**	**41**	**0.01**	**56**	**0.04**	**100**	**0.04**	**25**	**0.01**
Iceland	-	-	-	-	-	-	-	-	-	-	-
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-
Norway	-	-	-	-	-	-	-	-	-	-	-
Total	**-**	**-**	**55**	**41**	**0.01**	**56**	**0.04**	**100**	**0.04**	**25**	**0.01**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

surveillance in metropolitan France[2]. During 2011 only imported cases of chikungunya were reported from EU/EEA countries.

Travel-related chikungunya in the EU might result in onward transmission from an imported viraemic patient in places where the vector is established and where conditions are suitable for transmission (as they are in many Mediterranean countries of the EU). Therefore, continued surveillance for chikungunya and its vectors is needed, as well as vigilance among health professionals[3]. There is no antiviral treatment for chikungunya virus infection and no licensed vaccine to prevent disease. The long-lasting burden of the infection is significant, as shown in Italy[4].

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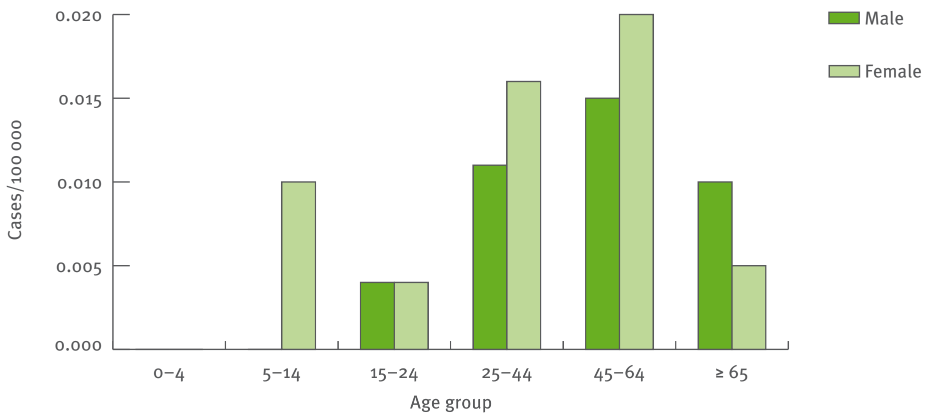
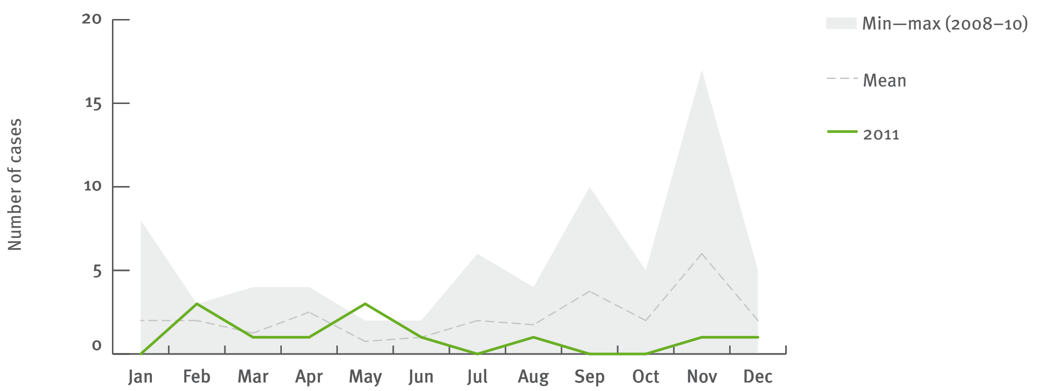
Figure 2.4.14. Rates of chikungunya cases reported in the EU/EEA, by age and gender, 2011 (47 cases)



Source: Country reports from Austria, the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Poland, Romania, Slovakia, Slovenia and the United Kingdom.

Figure 2.4.15. Seasonal distribution: Number of cases of chikungunya by month, EU/EEA, 2008–2011



Source: Country reports from Austria, the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Poland, Romania, Slovakia, Slovenia and the United Kingdom.

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by				National coverage
						Laboratories	Physicians	Hospitals	Others	
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	Y
Belgium	BE-REFLAB	V	Co	P	C	Y	N	N	N	Y
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y
Estonia	EE-VHF	Cp	Co	P	C	Y	Y	Y	Y	Y
Finland	FI-NIDR	Cp	Co	P	C	Y	N	N	N	Y
France	FR-MANDATORY_INFECTIOUS_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y
Germany	DE-SURVNET@RKI-7.1/6	Cp	Co	P	C	Y	Y	Y	Y	Y
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y
Hungary	HU-EFRIR	Cp	Co	P	C	Y	Y	Y	N	Y
Ireland	IE-NVRL	V	Co	P	C	Y	N	N	N	Y
Italy	IT-NRS	Cp	Co	P	C	N	Y	Y	N	Y
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	Y	Y	N	-	Y
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	N	Y
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	N	Y	Y	N	Y
Romania	RO-RNSSy	Cp	Co	P	C	Y	N	Y	N	Y
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y
Slovenia	SI-SURVIVAL	-	-	-	-	-	-	-	-	-
Spain	ES-NRL	V	Se	P	C	Y	N	N	N	N
Sweden	SE-SMINET	O	O	-	-	-	-	-	-	-
United Kingdom	UK-CHIKUNGUYA	V	Co	A	C	Y	N	Y	Y	Y

West Nile fever

- A total of 131 cases of West Nile fever were reported across the EU/EEA countries in 2011.
- In countries with previous case reports, the number of cases was lower in 2011 than in 2010, except for Italy.
- No new countries have reported autochthonous cases.
- In 2012, the number of cases again increased in previously affected countries and the geographic distribution expanded to affect new areas.
- The implementation of screening blood donations permitted the detection of positive blood donors in Italy and Greece in 2012.

West Nile fever is a disease caused by an arthropod-borne virus (genus *Flavivirus*) whose reservoirs are wild birds and mosquitoes (mainly *Culex* mosquitoes). Transmission to humans occurs primarily through mosquito bites. West Nile fever is endemic in the south-east of Europe. The disease is notifiable at EU level.

Epidemiological situation in 2011

In 2011, seven EU/EEA countries reported 131 cases of West Nile fever, as per the EU case definition (Table 2.4.6). No data were reported from Bulgaria, Denmark, Estonia, Iceland, Germany, Liechtenstein and Portugal. All countries with case reports in 2010 have also reported cases in 2011, except Spain.

The overall rate of autochthonous cases was 0.04 per 100 000 population. Of the countries that reported cases, the highest case rate was observed in Greece (0.88 per 100 000) and the lowest in Italy (0.02 per 100 000). In Romania and Hungary the rates were 0.05 and 0.04 per 100 000 population, respectively. France, Ireland and the Netherlands reported only imported cases. In addition, one imported case was also reported in Greece.

There was a large decrease in the number of reported autochthonous cases compared with 2010. All countries have reported fewer cases in 2011 than in 2010, except Italy (four cases reported in 2010). However, the figures are higher in 2011 than for 2007 to 2009, showing a general increasing trend (Figure 2.4.16).

In 2011, fourteen cases were reported to have died of West Nile disease: nine in Greece, four in Italy and one in Romania (for eleven cases the outcome was unknown).

Age and gender distribution

As in 2010, the highest notification rate of West Nile fever cases was reported in the ≥65-year-old age group (0.13 cases per 100 000), followed by 45–64-year-olds (0.04 cases per 100 000). Only two cases (1.5 %) were reported among children under the age of 15.

The overall rate was higher for men than for women (0.05 and 0.03 per 100 000, respectively), the male-to-female ratio was 1.6:1 (Figure 2.4.17).

Seasonality

As in previous years, most of the West Nile fever cases (123) were reported between August and October. However, the overall period of reporting was longer in 2011, with more cases reported in June (3% instead of 0.2% in 2010) and November. This seasonal pattern is consistent with the period of higher activity of mosquito vectors in the countries with case reports.

Updates from epidemic intelligence in 2012

Between June and November 2012, ECDC monitored the West Nile fever situation during the transmission season in the EU Member States and bordering countries. In 2012, 237 autochthonous cases, including 17 deaths, were detected in the EU and 670 in neighbouring countries[1].

In the EU, countries that have been affected since 2010 have also reported autochthonous cases in 2012: Greece (161), Italy (50), Romania (14) and Hungary (12). Greece reported one case infected through blood products. Italy has detected five positive blood donors through nucleic acid amplification test screening of blood donations implemented from 15 July to 30 November in areas which were affected in 2011, as per a 2012 national directive.

Outside of the EU, affected countries include Croatia, Montenegro, Serbia, Kosovo, the former Yugoslav

Table 2.4.6. Numbers and rates of West Nile fever cases reported in the EU/EEA, 2007–2011

Country	2011					2010		2009		2008		2007	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Crude rate	Cases	Crude rate	Cases	Crude rate	Cases	Crude rate	Cases	Crude rate
Austria	Y	C	0	0	0.00	-	-	0	0.00	0	0.00	-	-
Belgium	N	C	0	0	-	0	-	0	-	0	-	0	-
Bulgaria	-	-	-	-	-	-	-	-	-	0	0.00	0	0.00
Cyprus	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Czech Republic	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	-	-
Denmark	-	-	-	-	-	-	-	-	-	-	-	-	-
Estonia	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Finland	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
France	N	C	1	1	-	3	-	1	-	0	-	2	-
Germany	-	-	-	-	-	-	-	-	-	-	-	-	-
Greece	Y	C	100	52	0.88	262	2.32	0	0.00	0	0.00	0	0.00
Hungary	Y	C	4	4	0.04	19	0.19	7	0.07	19	0.19	4	0.04
Ireland	Y	C	1	1	0.02	0	0.00	0	0.00	0	0.00	0	0.00
Italy	Y	C	13	13	0.02	4	0.01	18	0.03	3	0.01	0	0.00
Latvia	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Lithuania	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Luxembourg	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	-	-
Malta	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Netherlands	Y	C	1	0	0.01	1	0.01	0	0.00	0	0.00	0	0.00
Poland	Y	A	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Portugal	-	-	-	-	-	-	-	-	-	-	-	-	-
Romania	Y	C	11	10	0.05	57	0.27	2	0.01	2	0.01	4	0.02
Slovakia	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Slovenia	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Spain	Y	C	0	0	0.00	2	0.00	0	0.00	0	0.00	0	0.00
Sweden	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
United Kingdom	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	1	0.00
EU total	**-**	**-**	**131**	**81**	**0.04**	**348**	**0.11**	**28**	**0.01**	**24**	**0.01**	**11**	**0.00**
Iceland	-	-	-	-	-	-	-	-	-	-	-	-	-
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	**-**	**-**	**131**	**81**	**0.04**	**348**	**0.11**	**28**	**0.01**	**24**	**0.01**	**11**	**0.00**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

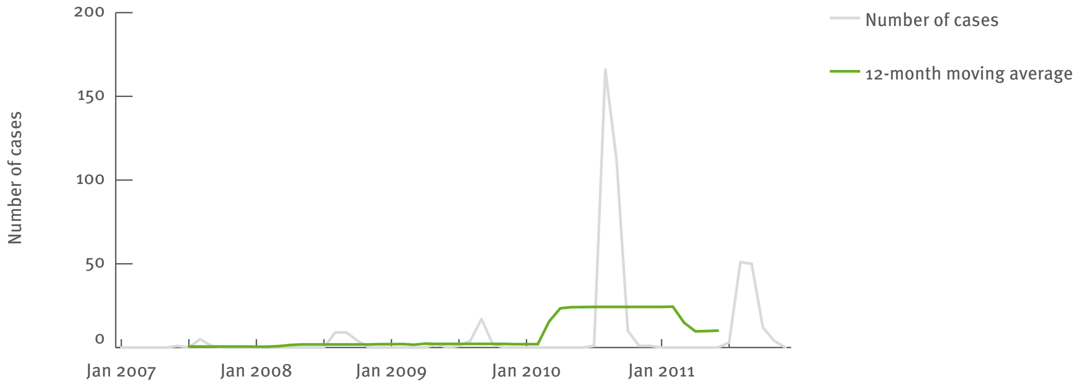
Republic of Macedonia, Russia, Ukraine, Israel and the occupied Palestinian territory, Algeria and Tunisia (Figure 2.4.19).

Discussion

The disease was first recognised in Europe in the 1960s[2] and re-appeared in 1996, when a large outbreak occurred in Romania[3]. Viruses of lineage 1 were the first identified in Europe but viruses of lineage 2 have also been reported in Europe since 2003 in birds[4] and more recently in Culex pipiens mosquitoes[5]. Since the first large outbreak of West Nile fever in Romania[3], West Nile virus has been recognised as a public health concern in Europe.

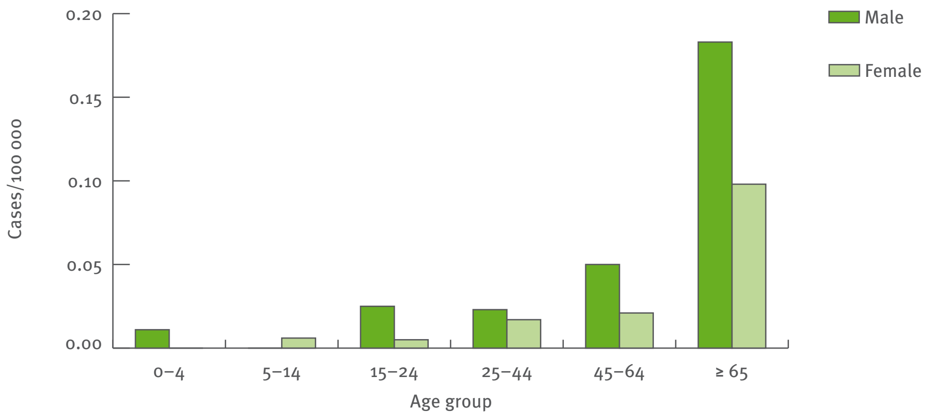
In 2011, the number of human cases of West Nile fever was lower than in 2010 but it increased again in 2012.

Figure 2.4.16. Trend and number of cases of West Nile fever in the EU/EEA, 2007–2011



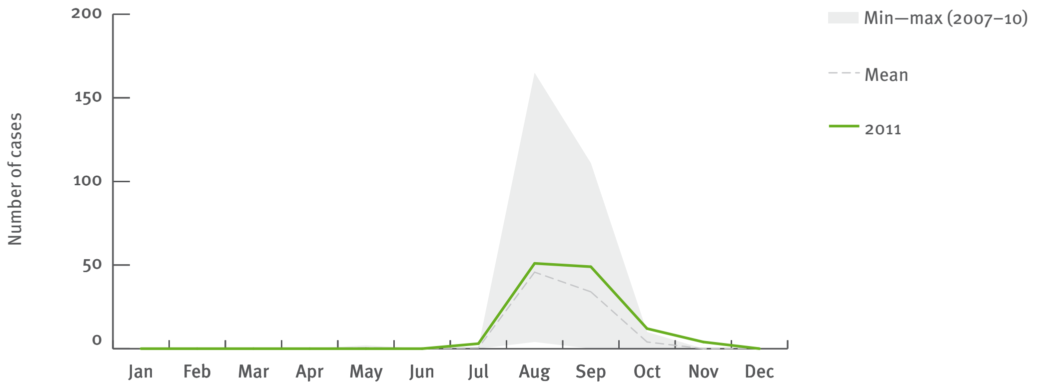
Source: Country reports from Cyprus, Estonia, Finland, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Malta, the Netherlands, Norway, Poland, Slovakia, Slovenia, Spain and Sweden.

Figure 2.4.17. Rates of West Nile fever cases reported in the EU/EEA, by age and gender, 2011



Source: Country reports from Austria, Belgium, Cyprus, the Czech Republic, Estonia, Finland, France, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Figure 2.4.18. Seasonal distribution: Number of cases of West Nile fever by month, EU/EEA, 2007–2011



Source: Country reports from Cyprus, Estonia, Finland, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Malta, the Netherlands, Norway, Poland, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Four countries in the EU have been affected for three consecutive years and the figures have steadily increased in Italy. Moreover, the geographic distribution in each country has expanded to affect new areas.

Greece was the country reporting the highest number of cases both in 2011 and 2012. In 2011, transmission was no longer limited to a specific region (Central Macedonia) but occurred on a large part of the continental territory, including the capital, Athens. It even spread to some islands (Samos and Kerkyra) in 2012. In Italy the island of Sardinia was affected for the first time in 2011. Transmission continued in 2012 and the province of Matera, in the south of the mainland, was hit.

In Romania, outbreaks were reported from counties located in the south-eastern part of the country and in the capital, Bucharest, both in 2011 and 2012. In Hungary, small outbreaks were reported across the country in 2012.

This is the first year that human cases of West Nile fever have been reported from Croatia, Serbia, Kosovo and Montenegro. However, West Nile virus circulation in horses was demonstrated through serological studies in Serbia in 2009 and 2010, and in Croatia in 2010 and 2011.

The increase of case reports can be partly explained by the substantial efforts made to strengthen the level of detection in the affected countries or in newly affected countries, as soon as the first cases were identified. Health professionals (including blood safety authorities) were alert at the beginning of the season, as were the stakeholders involved in animal and entomological surveillance. In Italy, special surveillance for West Nile fever was implemented in 2010 in the Veneto Region. The systematic nucleic acid screening of tissue and organ donations also implemented there in 2012 and carried out between 15 July and 30 November, in accordance with the National Blood Directive and the National Transplant Coordination, enabled detection of the first 2012 West Nile case (blood donor) in Italy[6]. The importance of the presence of both West Nile virus lineages 1 and 2 in Europe still needs to be elucidated, and continued close monitoring of the situation (in terms of human, veterinary and entomological surveillance) is required.

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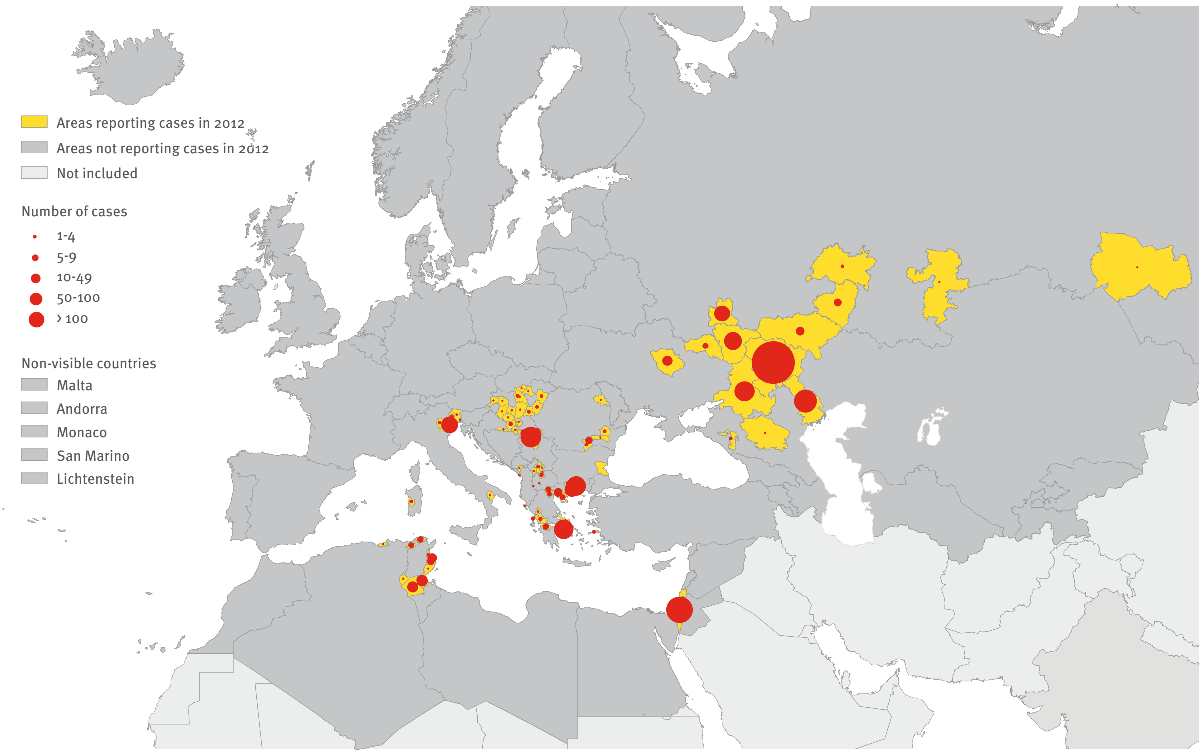
Figure 2.4.19. Reported cases of West Nile fever in EU and neighbouring countries, 2011 transmission season



Note: Data from Bulgaria are not included

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by				National coverage
						Laboratories	Physicians	Hospitals	Others	
Austria	AT-Reflab	V	O	P	C	Y	N	N	N	Y
Belgium	BE-REFLAB	V	Se	A	C	Y	N	N	N	Y
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y
Estonia	EE-VHF	Cp	Co	P	C	Y	Y	Y	Y	Y
Finland	FI-NIDR	Cp	Co	P	C	Y	N	N	N	Y
France	FR-WEST_NILE_VIRUS	V	Se	A	C	Y	Y	Y	Y	Y
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y
Hungary	HU-EFRIR	Cp	Co	P	C	Y	Y	Y	N	Y
Ireland	IE-WNF	V	Co	P	C	Y	N	N	N	Y
Italy	IT-NRS	Cp	Co	P	C	N	Y	Y	N	Y
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	Y	Y	N	-	Y
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y
Netherlands	NL-OSIRIS	Cp	Co	P	C	Y	Y	N	Y	Y
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	Y
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	N	Y	Y	N	Y
Romania	RO-RNSSy	Cp	Co	P	C	N	N	Y	N	Y
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y
Spain	ES-STATUTORY_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y
United Kingdom	UK-WEST_NILE_FEVER	V	Co	A	C	Y	N	Y	Y	Y

Yellow fever

Yellow fever is a viral infection that is present in some tropical areas of Africa and the central area of South America, where it has caused large outbreaks in the past. The virus is transmitted by mosquitoes which act as an important reservoir. Monkeys and humans also act as reservoirs in the jungle yellow fever and the urban yellow fever cycles. Following the insect bite, most infections remain without symptoms. When disease does develop, the first symptoms are high fever and red eyes, then a second rise in temperature occurs, accompanied by signs of liver and kidney failure and bleedings (primarily intestinal). Up to 50% of cases with liver damage may die. No specific therapy is available.

A highly effective vaccine is available, providing immunity to 95% of vaccinated persons; it should be recommended to travellers to endemic areas.

Epidemiological situation in 2011

No cases of yellow fever were reported in the EU in 2012. Twenty-nine EU/EEA countries reported data (Liechtenstein did not report).

Updates from epidemic intelligence in 2012

A large outbreak was reported in October 2012 in the region of Darfur, Sudan, with at least 165 deaths and a total of 732 suspected cases[1]. A high number of nomads were infected. A vast immunisation campaign was initiated in mid-November 2012, targeting 3.3 million people. The previous large outbreak was reported in 2005 in the Nuba Mountains in South Sudan[2].

Discussion

A safe and highly effective live attenuated vaccine is available. It provides protection for at least 10 years[3,4]. An update of the yellow fever risk map and recommendations for vaccination was published in 2011[5].

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2.5 Vaccine-preventable diseases

Diphtheria

- Diphtheria is largely under control in Europe.
- In 2011, 20 cases of diphtheria were reported across the EU, with a notification rate of <0.01 per 100 000 population.
- The majority of *C. diphtheria* cases occurred in 25–44-year-olds, while *C. ulcerans* cases were in older age groups (45–65 and older). The disease remains prevalent in Russia, Ukraine, and other parts of the world, and could cause new outbreaks in Europe if population immunity is low.
- Maintaining a high vaccination coverage in all age groups and increasing adult booster coverage remains essential.

Diphtheria is a disease caused by *Corynebacterium diphtheriae* and *Corynebacterium ulcerans*. It can cause respiratory symptoms or non-respiratory forms that affect other parts of the body, including the skin. Some strains are toxin-producing and can cause life-threatening illness. Thanks to childhood vaccination and regular adult booster doses, diphtheria has become a marginal problem in Europe.

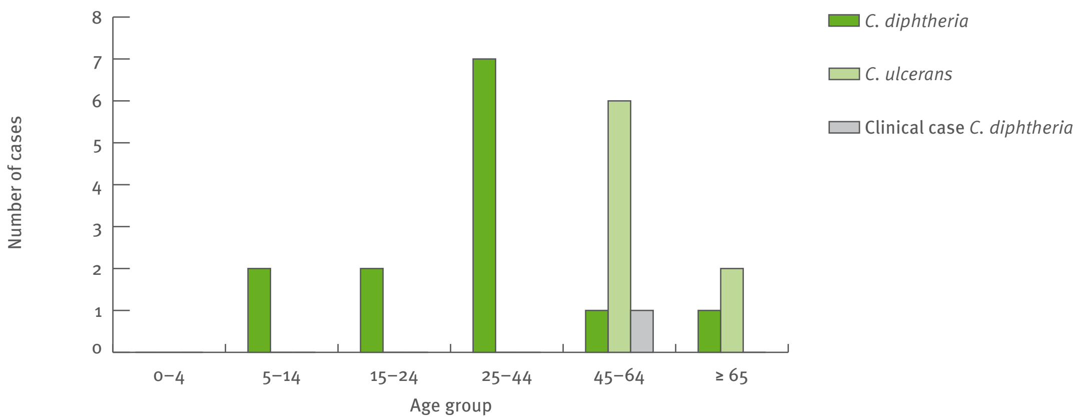
Epidemiological situation in 2011

In 2011, 29 EU/EEA countries provided diphtheria surveillance data. In total, 20 cases of diphtheria, 18 of which confirmed as caused by *C. diphtheriae* or *C. ulcerans*, were reported for an overall notification rate of <0.01 per 100 000 population (Table 2.5.1). The interpretation of the overall trend is difficult as only seven countries reported cases in the last five years; also, case detection is strongly influenced by availability of laboratory resources (techniques and supplies), expertise and surveillance systems. The high number of cases (n=29) reported from Latvia in 2008 has decreased since then; however, the reported cases in Latvia still exceed the number of cases reported in the rest of Europe. The number of cases remained low in all EU Member States that consistently reported diphtheria cases over the period. The year 2010 indicated the lowest number of reported cases in the last five years.

The majority of cases reported in 2011 were indigenous (n=14) whereas four cases were imported. Importation status was unknown for two cases.

Vaccination status was reported for eight cases out of 20; two of these cases were reported as vaccinated.

Figure 2.5.1. Age distribution of diphtheria diseases by pathogen, EU/EEA 2011



Outcome was reported for all cases and both pathogens. No deaths were reported.

Four countries reported 12 cases caused by *C. diphtheriae*, and four countries reported seven cases due to *C. ulcerans*. Lithuania reported one clinical case with an unknown pathogen (Table 2.5.2).

Table 2.5.2. Number of diphtheria cases by pathogen and country, EU/EEA, 2011

Country	*C. diphtheria*	*C. ulcerans*	Clinical case	Total
France	3	2	0	5
Germany	2	2	0	4
Latvia	6	0	0	6
Lithuania	0	0	1	1
Sweden	1	1	0	4
United Kingdom	0	2	0	2
Total	**12**	**7**	**1**	**20**

Seasonal distribution

The low number of reported cases did not allow a detailed analysis of seasonal trends; based on the available data, the number of cases was slightly higher during the colder months.

Age and gender distribution

Ten cases of diphtheria were younger than 45 years. *C. ulcerans* cases (n=7) were only reported in the age group 45 years and older (Figure 2.5.1). The disease was evenly distributed between males and females for both pathogens.

Discussion

Diphtheria is now a marginal problem in the EU/EEA, as only few sporadic cases are reported. High vaccination coverage and high living standards have interrupted the circulation of corynebacteria. The relatively high number of cases in Latvia may to a degree indicate the residual effects of an epidemic in the 1990s. Increased movement

Table 2.5.1. Numbers and rates of diphtheria cases reported in the EU/EEA, 2007–2011

Country	2011					2010		2009		2008		2007	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Crude rate	Cases	Crude rate	Cases	Crude rate	Cases	Crude rate	Cases	Crude rate
Austria	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Belgium	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Bulgaria	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Cyprus	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Czech Republic	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Denmark	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Estonia	-	-	-	-	-	-	-	-	-	-	-	-	-
Finland	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
France	Y	C	5	5	0.01	2	0.00	1	0.00	5	0.01	1	0.00
Germany	Y	C	4	4	0.01	8	0.01	4	0.01	0	0.00	2	0.00
Greece	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Hungary	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Ireland	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Italy	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Latvia	Y	C	6	5	0.24	2	0.09	5	0.22	28	1.23	15	0.66
Lithuania	Y	C	1	0	0.00	0	0.00	0	0.00	2	0.06	0	0.00
Luxembourg	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Malta	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Netherlands	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Poland	Y	A	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Portugal	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Romania	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Slovakia	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Slovenia	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Spain	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Sweden	Y	C	2	2	0.02	0	0.00	1	0.01	1	0.01	0	0.00
United Kingdom	Y	C	2	2	0.00	2	0.00	4	0.01	6	0.01	3	0.01
EU total	**-**	**-**	**20**	**18**	**0.00**	**14**	**0.00**	**15**	**0.00**	**42**	**0.01**	**21**	**0.00**
Iceland	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	0	0	0.00	0	0.00	0	0.00	4	0.08	0	0.00
Total	**-**	**-**	**20**	**18**	**0.00**	**14**	**0.00**	**15**	**0.00**	**46**	**0.01**	**21**	**0.00**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

across borders, with travel to Russia, Belarus, and Ukraine, is also likely to play a role[1].

Since 2008, European diphtheria surveillance distinguishes between *C. diphtheriae* and *C. ulcerans*[2] and pathogen-specific data have been available since 2010. Previously, these data were analysed together although the former pathogen is transmitted from human to human whereas the latter is zoonotic[3,4]. *C. ulcerans* infections were reported by France, Germany, Sweden and the United Kingdom, perhaps suggesting a higher awareness of this pathogen in these countries.

The overrepresentation of reported cases in young adults and the elderly suggests either waning immunity in the absence of booster doses or lack of high vaccination coverage in the past[1,5]. In 2011, only two of 20 cases were reported as vaccinated. A recent study carried out in six European countries and Israel found increasing age to be associated with an increase of seronegative subjects in the absence of repeated boosters[6]. A study carried out in Catalonia has revealed poor population immunity against diphtheria, with less than half of those born before 1975 properly immunised[7].

Regular seroprevalence studies are needed in the EU to identify and address gaps in population immunity against diphtheria. The disease is still prevalent in Belarus, Ukraine and Russia, and is endemic in Asia, Africa and South America. However, only four of 20 cases were reported as imported. To prevent future outbreaks of diphtheria in Europe, efforts must therefore continue to maintain national capacities[8] in rapid identification of cases. Furthermore, immunisation programmes should be shielded from budgetary constraints to maintain high diphtheria routine and booster vaccination coverage.

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Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by: Laboratories	Physicians	Hospitals	Others	National coverage	National reference laboratory data	Comparable data available	Case definition used
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Belgium	BE-REFLAB	V	Co	A	C	Y	N	N	N	Y	-	-	Not specified/unknown
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	Y	-	-	EU-2008
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y	-	-	EU-2008
Denmark	DK-MIS	Cp	Co	P	C	N	Y	N	N	Y	-	-	Other
Finland	FI-NIDR	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
France	FR-MANDATORY_INFECTIOUS_DISEASES	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	Not specified/unknown
Germany	DE-SURVNET@RKI-7.1/6	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	Other
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Hungary	HU-EFRIR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Ireland	IE-CIDR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Italy	IT-NRS	Cp	Co	P	C	N	Y	Y	N	Y	-	-	Other
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU case definition (legacy/deprecated)
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Netherlands	NL-OSIRIS	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	Not specified/unknown
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Portugal	PT-DIPHTERIA	Cp	Co	P	C	N	Y	N	N	Y	Y	1939	Other
Romania	RO-RNSSy	Cp	Co	P	C	Y	N	Y	N	Y	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y	-	-	EU-2008
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Spain	ES-STATUTORY_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
United Kingdom	UK-DIPHTHERIA	O	Co	P	C	Y	N	Y	Y	Y	-	-	Other

Invasive *Haemophilus influenzae* disease

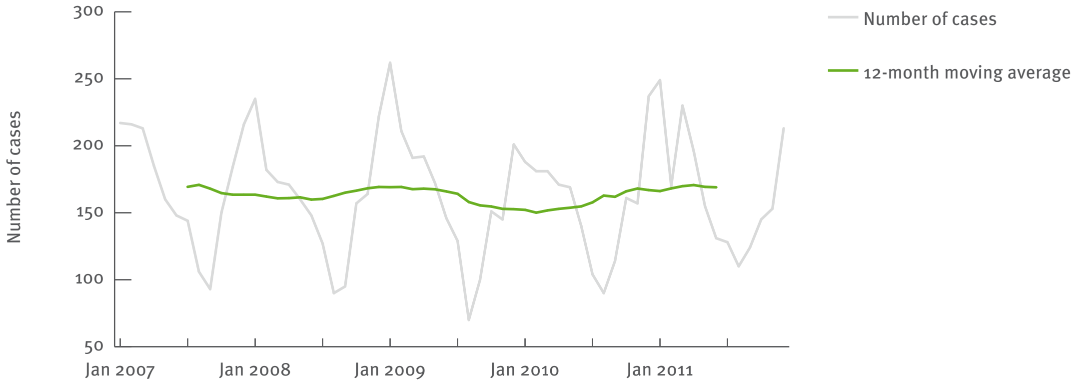
- Notification rates of invasive *Haemophilus influenzae* disease in 2011 remained stable in Europe at 0.38 cases per 100 000 population.
- Country-specific rates were highest in Sweden and Norway; age-specific rates were highest in young children and the elderly.
- The national immunisation schedules of all EU countries now include the Hib vaccine, which led to a progressive reduction of type b serotype infections. No serotype replacement has been observed so far.
- In order to maintain high coverage rates, routine Hib immunisation in early childhood should be encouraged and promoted.

Invasive *Haemophilus influenzae* disease is a systemic infection caused by the bacterium *Haemophilus influenzae*. It often presents as meningitis. Between the late 1990s and 2009, all EU countries introduced routine Hib vaccination in their early childhood vaccination schedules and *Haemophilus influenzae* has become a rare disease in the EU.

Epidemiological situation in 2011

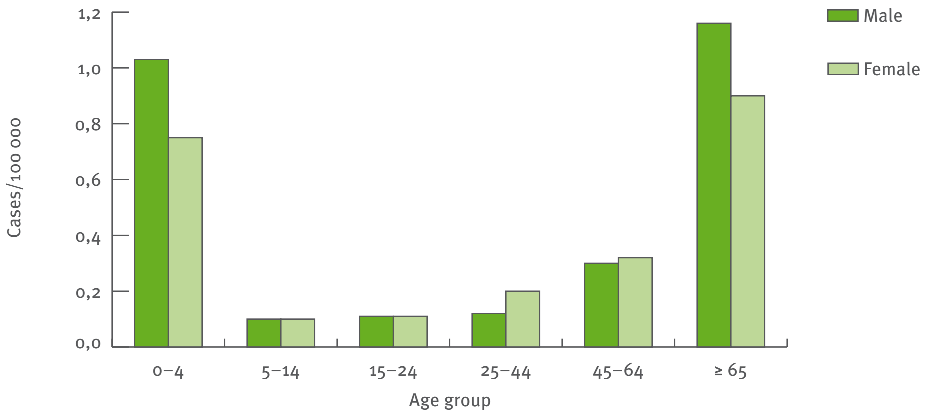
In 2011, 2 133 confirmed cases of invasive *Haemophilus influenzae* disease (all serotypes) were reported by 24 countries, 20 of which have surveillance systems with national coverage. Belgium, Cyprus, France and Spain reported data from sentinel surveillance and were excluded from the notification rates analysis, while no confirmed cases were reported from Germany, Latvia, Malta and Slovakia for 2011. No data were reported by Liechtenstein or Luxembourg (Table 2.5.3).

Figure 2.5.2. Trend and number of confirmed cases of invasive *Haemophilus influenzae* reported in the EU/EEA, 2007–2011



Source: Country reports from Austria, the Czech Republic, Denmark, Estonia, Finland, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Malta, Norway, Poland, Portugal, Slovakia, Slovenia, Sweden and the United Kingdom.

Figure 2.5.3. Rates of confirmed invasive *Haemophilus influenzae* cases reported in the EU/EEA, by age and gender, 2011



Source: Country reports from Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

The overall confirmed case notification rate was 0.38 per 100 000 population in 2011, comparable to the rates observed from 2007 to 2010. The highest rates in 2011 were reported by Sweden (2.16 per 100 000) and Norway (1.73), followed by Finland (1.23) and the United Kingdom (1.19). Finland observed the largest increase in notification rates over the last year, up from 0.75 per 100 000 in 2010. Rates in 18 of 23 countries remained below one case per 100 000 population (Table 2.5.3).

Age and gender distribution

In 2011, invasive *Haemophilus influenzae* disease was predominantly found in young children and the elderly (Figure 2.5.3), with a notification rate of 0.91 confirmed cases per 100 000 population in children under five years of age and 1.02 confirmed cases per 100 000 population in adults aged 65 years or older. For both age groups, higher rates were observed in males. High notification rates among adults aged 65 and older were reported from Sweden (6.97 per 100 000) and Norway (4.72 per 100 000).

The overall notification rate was 0.37 per 100 000 population for males and 0.38 for females, with a male-to-female ratio of 1.02:1.

Seasonality

The distribution of observed invasive *Haemophilus influenzae* cases follows a seasonal pattern, with the highest number of reported cases in the winter months, followed by a steady decrease until August and an increase towards a peak in December. The pattern follows the one established in 2006–09 (Figure 2.5.4).

Enhanced surveillance in 2011

There are no indications of serotype replacement from type b to non-capsulated (non-typeable) b strains[1–3]. Serotype b infections have remained constantly low in Europe since 2007, with a slightly decreasing trend.

Table 2.5.3. Numbers and rates of confirmed invasive *Haemophilus influenzae* cases reported in the EU/EEA, 2007–2011

Country	2011					2010		2009		2008		2007	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed c ases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Crude rate	Cases	Crude rate	Cases	Crude rate	Cases	Crude rate	Cases	Crude rate
Austria	Y	C	4	3	0.04	2	0.02	14	0.17	5	0.06	4	0.05
Belgium	N	C	96	96	-	0	-	76	-	49	-	55	-
Bulgaria	Y	A	2	2	0.03	10	0.13	15	0.20	14	0.18	19	0.25
Cyprus	N	C	1	1	-	3	0.37	2	0.25	0	0.00	0	0.00
Czech Republic	Y	C	15	15	0.14	22	0.21	10	0.10	7	0.07	13	0.13
Denmark	Y	C	47	47	0.85	43	0.78	31	0.56	32	0.58	15	0.28
Estonia	Y	C	2	2	0.15	1	0.08	1	0.08	1	0.08	2	0.15
Finland	Y	C	66	66	1.23	41	0.77	47	0.88	45	0.85	54	1.02
France	N	C	492	492	-	371	-	417	-	442	-	658	-
Germany	Y	C	0	0	0.00	224	0.27	199	0.24	160	0.20	93	0.11
Greece	Y	C	1	1	0.01	4	0.04	13	0.12	4	0.04	7	0.06
Hungary	Y	C	8	8	0.08	5	0.05	3	0.03	6	0.06	2	0.02
Ireland	Y	C	44	44	0.96	26	0.58	43	0.97	22	0.50	31	0.72
Italy	Y	C	47	47	0.08	69	0.11	56	0.09	50	0.08	33	0.06
Latvia	Y	C	1	0	0.00	0	0.00	1	0.04	1	0.04	0	0.00
Lithuania	Y	C	3	2	0.07	1	0.03	1	0.03	3	0.09	0	0.00
Luxembourg	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	1	0.21
Malta	Y	C	0	0	0.00	2	0.48	3	0.73	0	0.00	1	0.25
Netherlands	Y	C	118	118	0.71	141	0.85	102	0.62	87	0.53	-	-
Poland	Y	C	22	22	0.06	25	0.07	19	0.05	28	0.07	39	0.10
Portugal	Y	C	32	22	0.21	10	0.10	8	0.08	5	0.05	16	0.15
Romania	Y	C	10	10	0.05	19	0.09	22	0.10	2	0.01	-	-
Slovakia	Y	C	0	0	0.00	3	0.06	5	0.09	4	0.07	6	0.11
Slovenia	Y	C	22	22	1.07	15	0.73	18	0.89	12	0.60	13	0.65
Spain	N	C	77	77	-	78	-	53	-	73	-	66	-
Sweden	Y	C	203	203	2.16	179	1.92	146	1.58	163	1.78	144	1.58
United Kingdom	Y	C	746	746	1.20	622	1.01	742	1.21	773	1.27	696	1.15
EU total	**-**	**-**	**2059**	**2046**	**0.37**	**1916**	**0.39**	**2047**	**0.40**	**1988**	**0.38**	**1968**	**0.35**
Iceland	Y	C	2	2	0.63	0	0.00	0	0.00	0	0.00	1	0.33
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	85	85	1.73	89	1.83	71	1.48	75	1.58	83	1.77
Total	**-**	**-**	**2146**	**2133**	**0.38**	**2005**	**0.41**	**2118**	**0.41**	**2063**	**0.39**	**2052**	**0.37**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

Discussion

In EU/EEA countries, invasive *Haemophilus influenzae* disease remains rare and notification rates are stable. As in previous years, the disease was most prominent in northern countries. This observation is possibly due to improved case ascertainment, the implementation of enhanced surveillance systems, and physicians' heightened awareness.

Absolute numbers and rates, as well as age distributions, should be compared with caution because of differences in national surveillance systems. In addition, as the disease is rare and the reported number of cases is relatively low, small changes in numbers may cause large differences in notification rates. Caution must be taken when analysing trends due to changes in surveillance methods, such as new laboratory methodologies and improvements in system comprehensiveness. In the past, surveillance systems in many countries only recorded serotype b in the age group of 0–5-year-olds. In the last few years, most countries have enhanced their surveillance systems and now cover all age groups and non-b/non-typeable serotypes.

It is important that Hib immunisation coverage rates are maintained and possibly increased, since the vaccine has proved to be effective and has led to a progressive reduction of b-serotype infections. Furthermore, there is no evidence so far of possible serotype replacement since the introduction of the vaccine in national immunisation schedules[1–3].

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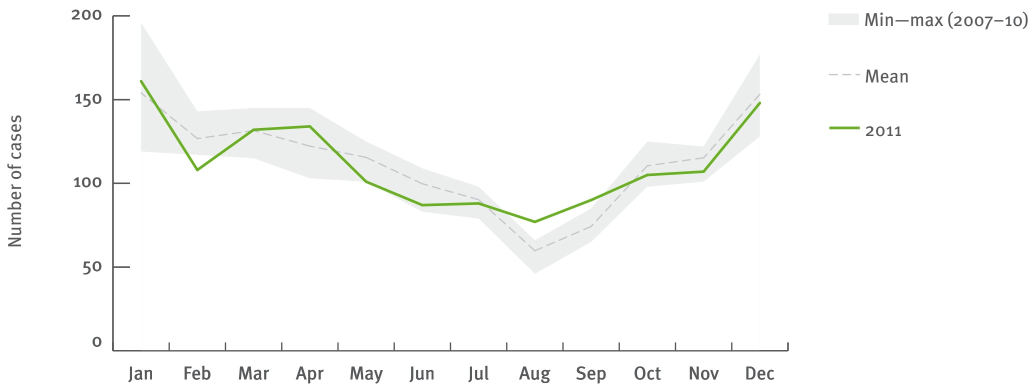
Figure 2.5.4. Seasonal distribution: Number of cases of invasive *Haemophilus influenzae* by month, EU/EEA, 2007–2011



Source: Country reports from Austria, the Czech Republic, Denmark, Estonia, Finland, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Malta, Norway, Poland, Portugal, Slovakia, Slovenia, Sweden and the United Kingdom.

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by: Laboratories	Physicians	Hospitals	Others	National coverage	National reference laboratory data	Comparable data available	Case definition used
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Belgium	BE-LABNET	V	Se	A	C	Y	N	-	-	Y	-	-	Not specified/unknown
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	Y	-	-	EU-2008
Cyprus	CY-LABNET	V	Se	A	C	Y	N	N	N	N	-	-	Not specified/unknown
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y	-	-	EU-2008
Denmark	DK-MIS	Cp	Co	P	C	N	Y	N	N	Y	-	-	Other
Estonia	EE-HIB	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Finland	FI-NIDR	Cp	Co	P	C	Y	N	N	N	Y	-	-	Not specified/unknown
France	FR-EPIBAC	V	Se	A	C	Y	N	Y	N	Y	-	-	EU-2008
Germany	DE-SURVNET@RKI-7.1	Cp	Co	P	C	Y	N	N	Y	Y	-	-	Other
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	Other
Hungary	HU-EFRIR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Ireland	IE-CIDR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Italy	IT-MENINGITIS	Cp	Co	P	C	N	Y	Y	Y	-	-	-	EU-2008
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU case definition (legacy/deprecated)
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	-	Y	N	-	-	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Netherlands	NL-NRBM	V	Co	P	C	Y	N	N	N	Y	-	-	EU-2008
Netherlands	NL-OSIRIS	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	Not specified/unknown
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	N	Y	Y	N	Y	-	-	Not specified/unknown
Portugal	PT-HAEMOPHILUS_INFLUENZAE	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2002
Romania	RO-RNSSy	Cp	Co	P	C	N	N	Y	N	Y	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y	-	-	EU-2008
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Spain	ES-MICROBIOLOGICAL	V	Se	P	C	Y	N	N	N	N	-	-	EU-2008
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008

Invasive meningococcal disease

- Invasive meningococcal disease (IMD) is rare in Europe: 0.75 cases per 100 000 population were observed in 2011; rates of confirmed IMD range from 1.99 to 0.09 cases per 100 000 population.
- Infants and children younger than five years of age are at the highest risk, followed by 15–19-year-olds.
- Most invasive meningococcal diseases are caused by serogroups B and C, with serogroup B being dominant.
- A decreasing trend has been observed over the last ten years, partly attributable to the introduction of serogroup C conjugate vaccine to the universal immunisation schedule.
- A new vaccine against serogroup B has been granted a license and will soon be available for possible inclusion in national childhood immunisation programmes.
- Strengthening surveillance of meningococcal disease is important to evaluate the impact of the ongoing vaccination programmes and supports decision-makers in view of the availability of a new vaccine against serogroup B.

Invasive meningococcal disease (IMD) is an acute bacterial disease that is uncommon but often severe and potentially life-threatening. The infectious agent is *Neisseria meningitidis*, a Gram-negative aerobic diplococcus. Invasive disease is characterised by meningitidis, meningococcemia, bacteraemia, sepsis, or, less commonly, pneumonia, arthritis, and pericarditis. Case–fatality rates are high at approximately 8–15%. Ten per cent to 20% of survivors suffer long-term sequelae, including mental retardation, hearing loss, and loss of limb use[1].

Neisseria are divided into serogroups according to the immunological reactivity of their capsular polysaccharide. Vaccines are available to protect against meningococcal infection due to serogroup C or against serogroups A, C, Y and W125. Since several countries have introduced the serogroup C conjugate vaccine to routine childhood immunisation, a decrease in the disease burden has been observed. Recently, a vaccine against group B disease, the most prevalent serogroup, was granted a licence from the European Commission and will soon be available to be included in the childhood immunisation programmes.

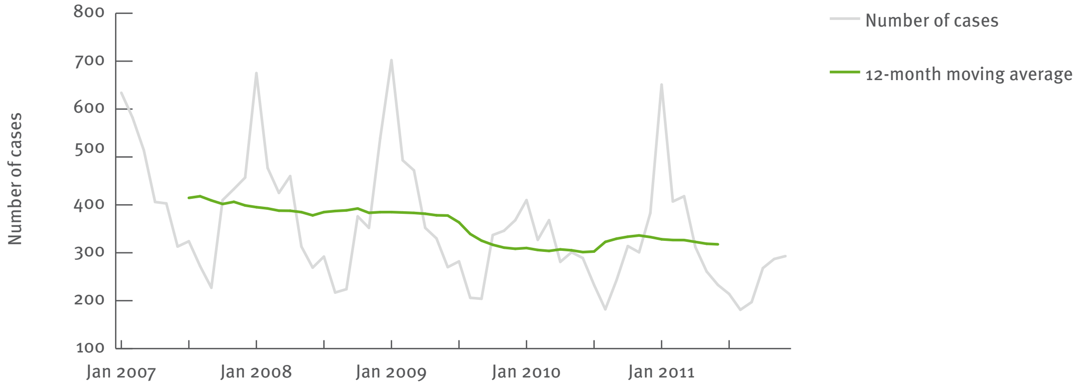
Epidemiological situation in 2011

In 2011, 4 121 cases of IMD were reported by 29 EU/EEA countries, and 3 814 were confirmed. The notification rate for confirmed cases was 0.75 per 100 000 population. Ireland, the United Kingdom and Malta reported the highest rates with 1.99, 1.66 and 1.44 confirmed cases per 100 000 population (Table 2.5.4). The higher age standardised rates were reported by the same countries. The notification rate in EU/EEA countries declined from 1.02 cases per 100 000 population in 2007 to 0.75 cases per 100 000 in 2011.

Age and gender distribution

Children younger than five years of age continued to experience the highest rates of IMD (5.73 per 100 000), followed by those aged 15–24 years (1.29 per 100 000) (Figure 2.5.6). Lower notification rates were observed among adults. In children below five years of age, higher incidences were observed in males compared to females; no differences in gender within other age groups were observed (Figure 2.5.6).

Figure 2.5.5. Trend and number of confirmed invasive meningococcal disease cases reported in the EU/EEA, 2007–2011



Source: Country reports from Austria, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Lithuania, Malta, the Netherlands. Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Seasonality

In 2011, as in previous years, a seasonal pattern was observed. IMD occurred primarily in winter and declined by late summer. The monthly distribution of cases from 2007 to 2011 is presented in Figure 2.5.7.

Enhanced surveillance in 2011

A decreasing trend has been observed over the last decade. The reduction in the number of confirmed cases is due to the decreasing incidence of serogroup B and C disease. An increase in the notification rates was observed for serogroup Y.

The highest proportion of cases in all age groups – particularly among children below five years of age – is due to serogroup B, followed by serogroup C.

Discussion

IMD is rare in Europe where 0.75 cases per 100 000 population were observed in 2011. Notification rates of confirmed IMD in Europe range from 1.99 to 0.09 cases per 100 000 population. The majority of cases were attributed to serogroups B and C, with serogroup B being dominant.

The reduction in the proportion of meningococcal infection due to serogroup C is mainly attributable to the introduction of universal vaccination programmes in some EU/EEA countries[4,5]. Variations in reported rates may also reflect differences in surveillance systems and case ascertainment[5].

Strengthening surveillance of meningococcal disease is important to evaluate the impact of ongoing vaccination programmes and to support decision-makers in view of the potential availability of a new vaccine against serogroup B.

Table 2.5.4. Numbers and rates of confirmed invasive meningococcal disease cases reported in the EU/EEA, 2007–2011

Country	2011					2010		2009		2008		2007	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed c ases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Crude rate	Cases	Crude rate	Cases	Crude rate	Cases	Crude rate	Cases	Crude rate
Austria	Y	C	68	49	0.58	85	1.02	89	1.07	84	1.01	61	0.74
Belgium	N	C	111	111	-	96	-	104	-	110	-	158	-
Bulgaria	Y	A	18	13	0.18	8	0.11	16	0.21	20	0.26	24	0.31
Cyprus	N	C	1	1	-	1	0.12	1	0.13	2	0.25	4	0.51
Czech Republic	Y	C	66	63	0.60	60	0.57	80	0.76	82	0.79	75	0.73
Denmark	Y	C	93	72	1.30	66	1.19	71	1.29	63	1.15	78	1.43
Estonia	Y	C	7	7	0.52	2	0.15	5	0.37	6	0.45	11	0.82
Finland	Y	C	34	34	0.63	34	0.64	33	0.62	28	0.53	42	0.80
France	Y	C	574	563	0.87	511	0.79	606	0.94	657	1.03	678	1.07
Germany	Y	C	370	370	0.45	384	0.47	493	0.60	451	0.55	436	0.53
Greece	Y	C	55	52	0.46	55	0.49	77	0.68	78	0.70	106	0.95
Hungary	Y	C	67	67	0.68	37	0.38	37	0.38	30	0.30	43	0.43
Ireland	Y	C	94	89	1.95	98	2.19	134	3.01	152	3.45	162	3.76
Italy	Y	C	152	152	0.25	150	0.25	181	0.30	178	0.30	178	0.30
Latvia	Y	C	15	2	0.10	5	0.22	4	0.18	7	0.31	15	0.66
Lithuania	Y	C	80	42	1.38	48	1.44	39	1.16	48	1.43	50	1.48
Luxembourg	Y	C	2	2	0.39	1	0.20	3	0.61	2	0.41	2	0.42
Malta	Y	C	6	6	1.44	2	0.48	5	1.21	3	0.73	6	1.48
Netherlands	Y	C	106	106	0.64	143	0.86	150	0.91	162	0.99	195	1.19
Poland	Y	C	284	282	0.73	228	0.60	301	0.79	321	0.84	335	0.88
Portugal	Y	C	69	56	0.54	79	0.76	65	0.62	60	0.58	98	0.94
Romania	Y	C	76	68	0.32	52	0.24	102	0.48	104	0.48	145	0.67
Slovakia	Y	C	26	21	0.39	37	0.68	39	0.72	48	0.89	35	0.65
Slovenia	Y	C	13	13	0.63	9	0.44	15	0.74	24	1.19	18	0.90
Spain	Y	C	555	431	0.93	404	0.88	533	1.16	590	1.30	619	1.39
Sweden	Y	C	68	68	0.72	67	0.72	65	0.70	49	0.53	49	0.54
United Kingdom	Y	C	1072	1036	1.67	1008	1.64	1190	1.93	1355	2.23	1522	2.52
EU total	-	-	**4082**	**3776**	**0.75**	**3670**	**0.73**	**4438**	**0.89**	**4714**	**0.95**	**5145**	**1.03**
Iceland	Y	C	2	2	0.63	2	0.63	5	1.57	2	0.63	4	1.30
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	37	37	0.75	39	0.80	44	0.92	36	0.76	30	0.64
Total	-	-	**4121**	**3815**	**0.75**	**3711**	**0.73**	**4487**	**0.89**	**4752**	**0.95**	**5179**	**1.03**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

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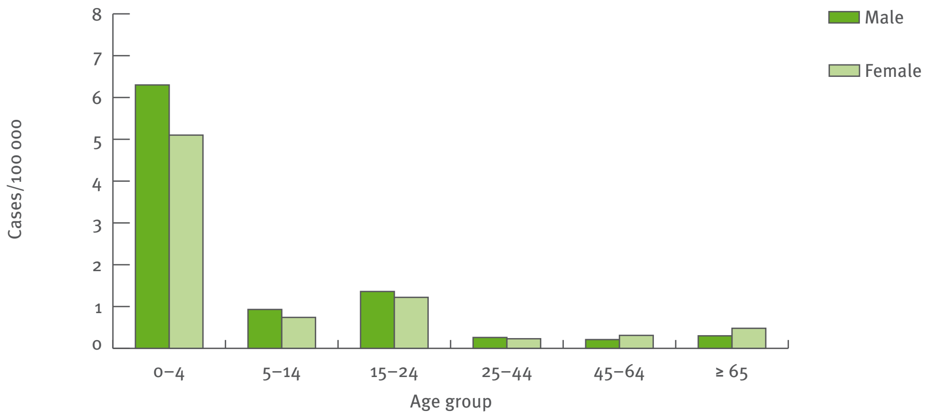
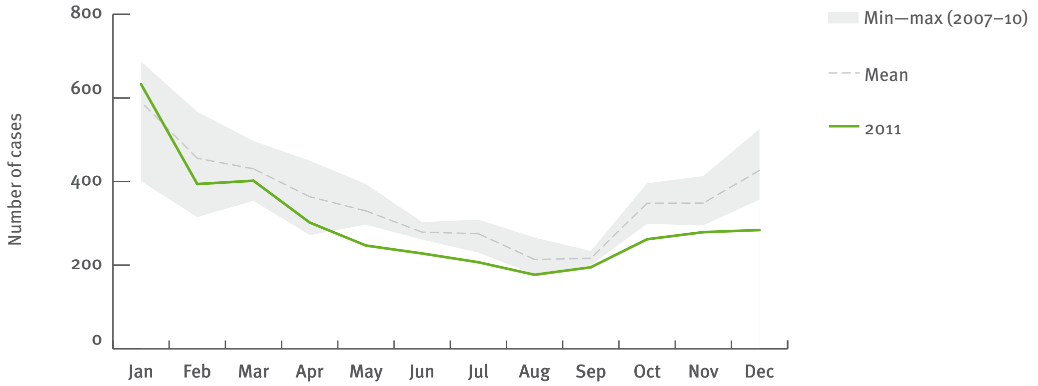
Figure 2.5.6. Rates of invasive confirmed meningococcal disease cases reported in the EU/EEA, by age and gender, 2007–2011



Source: Country reports from Austria, Belgium, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Figure 2.5.7. Seasonal distribution: Number of confirmed cases of invasive meningococcal disease by month, EU/EEA, 2007–2011



Source: Country reports from Austria, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Lithuania, Malta, the Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by: Laboratories	Physicians	Hospitals	Others	National coverage	National reference laboratory data	Comparable data available	Case definition used
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Belgium	BE-REFLAB	V	Se	A	C	Y	N	N	N	Y	-	-	Not specified/unknown
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	Y	-	-	EU-2008
Cyprus	CY-LABNET	V	Se	A	C	Y	N	N	N	N	-	-	Not specified/unknown
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y	-	-	EU-2008
Denmark	DK-MIS	Cp	Co	P	C	N	Y	N	N	Y	-	-	Other
Estonia	EE-MENINGOCOCC	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2002
Finland	FI-NIDR	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Other
France	FR-MANDATORY_INFECTIOUS_DISEASES	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Germany	DE-SURVNET@RKI-7.1/6	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	Other
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Hungary	HU-EFRIR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Ireland	IE-CIDR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Italy	IT-MENINGITIS	Cp	Co	P	C	N	Y	Y	N	Y	-	-	EU-2008
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU case definition (legacy/deprecated)
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Netherlands	NL-OSIRIS	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Portugal	PT-MENINGOCOCAL	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2002
Romania	RO-RNSSy	Cp	Co	P	C	N	N	Y	N	Y	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y	-	-	EU-2008
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Spain	ES-STATUTORY_DISEASES	Cp	Co	P	C	N	Y	Y	N	Y	-	-	EU-2008
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
United Kingdom	UK-MENINGOCOCCAL	O	Co	P	C	Y	N	Y	Y	Y	-	-	Other

Invasive pneumococcal disease

- The overall confirmed notification rate of invasive pneumococcal disease (IPD) remained stable at 3.8 cases per 100 000 population in 2011.
- Country-specific rates were highest in the Nordic countries; age-specific rates were highest in young children and the elderly.
- The emergence of non-vaccine serotypes remains an important issue; continued monitoring in Europe is essential for assessing interventions and informing the development of new vaccines.

Invasive pneumococcal disease is an acute and life-threatening disease caused by *Streptococcus pneumoniae*. Invasive disease encompasses severe syndromes including meningitis, septicaemia, pneumonia/empyema, and bacteraemia and may derive to sequelae. Children are at major risk, together with immunocompromised patients and the elderly. Globally, an estimated 1.6 million people, including one million children under five years of age, die of IPD annually[1].

Epidemiological situation in 2011

In 2011, 20 260 confirmed cases of invasive pneumococcal disease were reported by 27 countries, 23 of which run surveillance systems with national coverage.

Table 2.5.5. Numbers and rates of confirmed invasive pneumococcal cases reported in the EU/EEA, 2007–2011

Country	2011						2010		2009		2008		2007	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population			Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Crude rate	Age-standardised rate	Cases	Crude rate	Cases	Crude rate	Cases	Crude rate	Cases	Crude rate
Austria	Y	C	205	158	1.88	1.83	325	3.88	296	3.54	133	1.60	361	4.36
Belgium	N	C	1 836	1 836	-	-	1 851	-	2 051	-	1 875	-	1 728	-
Bulgaria	Y	A	37	37	0.50	0.51	26	0.34	46	0.61	35	0.46	39	0.51
Cyprus	N	C	12	12	-	-	12	1.47	9	1.13	21	2.66	6	0.77
Czech Republic	Y	C	384	384	3.66	3.67	300	2.86	143	1.37	117	1.13	89	0.87
Denmark	Y	C	924	924	16.62	16.33	960	17.35	129	2.34	120	2.19	101	1.85
Estonia	Y	C	18	18	1.34	1.33	14	1.05	14	1.04	32	2.39	36	2.68
Finland	Y	C	779	779	14.49	13.87	836	15.62	855	16.05	925	17.45	791	14.99
France	N	C	5 037	5 037	-	-	5 117	-	-	-	-	-	-	-
Germany	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Greece	Y	C	41	41	0.36	0.36	38	0.34	66	0.59	63	0.56	-	-
Hungary	Y	C	107	107	1.09	1.06	108	1.10	49	0.50	65	0.66	57	0.57
Ireland	Y	C	357	357	7.81	9.18	304	6.80	357	8.02	401	9.11	438	10.16
Italy	Y	C	713	713	1.18	1.07	854	1.42	738	1.23	694	1.16	-	-
Latvia	Y	A	51	51	2.46	2.45	16	0.71	7	0.31	7	0.31	4	0.18
Lithuania	Y	C	9	9	0.30	0.31	9	0.27	16	0.48	18	0.54	32	0.95
Luxembourg	Y	C	2	2	0.39	0.38	2	0.40	0	0.00	0	0.00	2	0.42
Malta	Y	C	11	11	2.65	2.48	11	2.66	9	2.18	0	0.00	0	0.00
Netherlands	Y	C	56	56	0.34	0.31	55	0.33	35	0.21	609	-	0	0.00
Poland	Y	C	351	351	0.91	0.92	333	0.87	274	0.72	212	0.56	250	0.66
Portugal	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Romania	Y	C	100	90	0.42	0.43	80	0.37	122	0.57	0	0.00	-	-
Slovakia	Y	C	57	57	1.06	1.10	18	0.33	29	0.54	36	0.67	37	0.69
Slovenia	Y	C	255	255	12.44	12.17	224	10.94	253	12.45	204	10.15	192	9.55
Spain	N	C	2 220	2 220	-	-	2 212	-	1 339	-	1 648	-	1 428	-
Sweden	Y	C	1 361	1 361	14.46	13.76	1 456	15.59	1 618	17.48	1 789	19.48	1 441	15.81
United Kingdom	Y	C	4 632	4 632	7.47	7.34	5 616	9.12	5 019	8.15	5 514	9.07	5 624	9.32
EU total	**-**	**-**	**19 555**	**19 498**	**3.63**	**3.55**	**20 777**	**4.05**	**13 474**	**3.53**	**14 518**	**3.88**	**12 656**	**4.97**
Iceland	Y	C	33	33	10.36	11.67	32	10.08	-	-	-	-	-	-
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	729	729	14.82	15.52	748	15.40	799	16.65	855	18.05	958	20.47
Total	**-**	**-**	**20 317**	**20 260**	**3.83**	**3.74**	**21 557**	**4.24**	**14 273**	**3.74**	**15 373**	**4.12**	**13 614**	**5.34**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

Belgium, Cyprus, France and Spain reported data from sentinel surveillance and were excluded from the notification rates analysis. The total number of reported confirmed cases has significantly increased since 2009 (14 273), which is a consequence of improvements in reporting in some countries (Denmark, Spain), the inclusion of data from a different data source (Czech Republic), and the first contributions by Iceland and France (Table 2.5.5).

The overall reported confirmed case rate was 3.8 per 100 000, comparable with previous years (Table 2.5.5, Figure 2.5.8). Compared with other countries, higher notification rates – albeit lower than in 2010 – were observed in Nordic countries, with the highest rates reported by Denmark (16.6 per 100 000), Norway (14.8), Finland (14.5) and Sweden (14.5). Lithuania reported the lowest confirmed case rate, 0.3 per 100 000, followed by the Netherlands. Latvia observed the largest increase in notification rate over the last years (2.3, up from 0.7 per 100 000 in 2010) (Table 2.5.5).

Age and gender distribution

IPD was predominantly found in young children and the elderly (Figure 2.5.9). The notification rate of confirmed cases was 5.6 per 100 000 population in children under five years of age and 10.3 per 100 000 population in adults aged 65 years or older, with higher rates in males than females for both these age groups. The confirmed case rate was slightly higher for males (4.2 per 100 000) than females (3.4 per 100 000). This trend was observed in all age groups, giving an overall male-to-female ratio of 1.2:1.

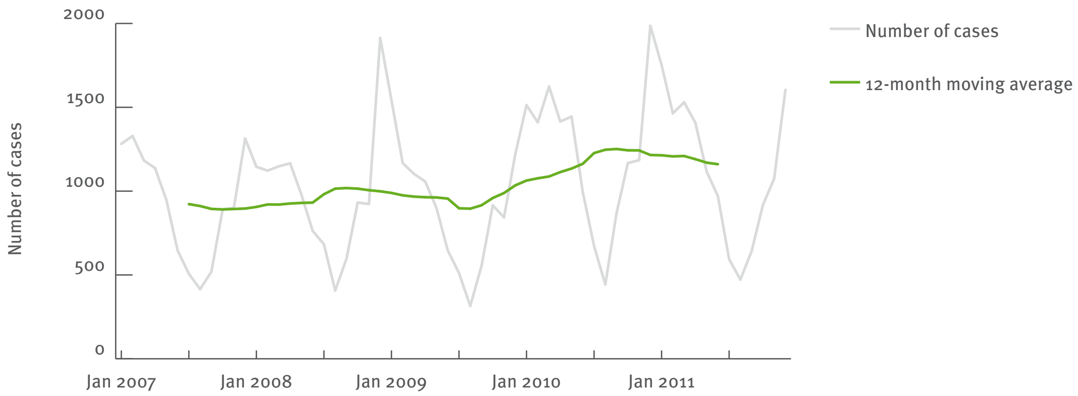
Seasonality

The seasonal distribution of cases of IPD follows a pattern similar to that of other respiratory diseases. In 2011, the lowest rates were observed during summer, increasing rapidly with the onset of autumn and winter, peaking in December. This pattern was similar to the pattern from 2007 to 2010 (Figure 2.5.10).

Enhanced surveillance in 2011

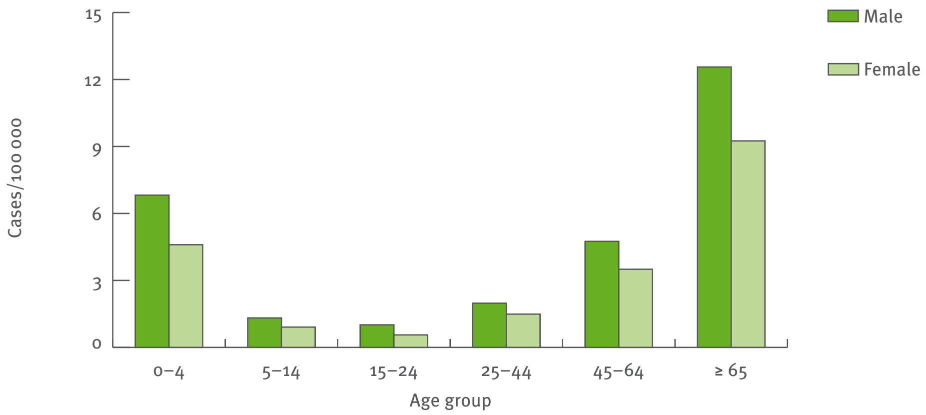
Twenty-three EU/EEA countries reported data on serotype (15 387 isolates, 74% of all confirmed cases). The ten most common serotypes were 7F, 19A, 3, 1, 22F, 8, 14, 12F, 6C and 4 (ordered by frequency), accounting for 61.5% of the typed isolates.

Figure 2.5.8. Trend and number of confirmed cases of invasive pneumococcal disease reported in the EU/EEA, 2007–2011



Source: Country reports from Austria, Bulgaria, Denmark, Estonia, Finland, Hungary, Ireland, Luxembourg, Malta, the Netherlands, Norway, Slovakia, Slovenia, Sweden and the United Kingdom.

Figure 2.5.9. Rates of confirmed invasive pneumococcal cases reported in the EU/EEA, by age and gender, 2011



Source: Country reports from Austria, Bulgaria, the Czech Republic, Denmark, Estonia, Finland, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Malta, the Netherlands, Norway, Poland, Romania, Slovakia, Slovenia, Sweden and the United Kingdom.

Data on antimicrobial susceptibility testing were submitted by 18 countries. Erythromycin was the antibiotic that presented the highest non-susceptibility (intermediate and resistant) proportion (25.4%), followed by penicillin (18.4%). High or very high levels of resistance to both antimicrobials were observed in Denmark and Romania. Among all isolates tested against erythromycin, penicillin and cefotaxime, 68.5% were fully susceptible and 4.7% non-susceptible to all three. Notable resistance to all three antimicrobials was observed in serotype 19A isolates (28.1%).

Discussion

The confirmed notification rate of IPD varied widely across Europe, ranging from 0.3 to 16.6 per 100 000 population by country, with high rates in Nordic countries. This reflects the variation in intercountry incidence as well as significant differences in national surveillance systems, diagnosis and medical practices (especially regarding blood culturing)[2,3]. Overall, data completeness is increasing throughout Europe. Despite the fact that the EU 2008 case definition was applied in almost all Member States, comparisons between countries should be made with caution. The increase observed in the total number of reported cases, compared to 2009, can be attributed to the contribution of countries which previously did not report and improvements in reporting.

The introduction of pneumococcal conjugate vaccines, such as PCV7, has proved to be very effective in reducing the carriage and incidence of invasive pneumococcal disease. However, serotype replacement led to increased rates of carriage and disease of non-vaccine serotypes while there has also been a rise in some antimicrobial resistant, non-vaccine strains[4,5]. Evidence is now emerging of further serotype replacement as a result of the PCV13 vaccine, introduced in 2010, although the extent of this is yet to be determined[6]. The continued monitoring of the relative prevalence of circulating serotypes and antimicrobial resistance in Europe is essential in assessing interventions and informing the development of new vaccines.

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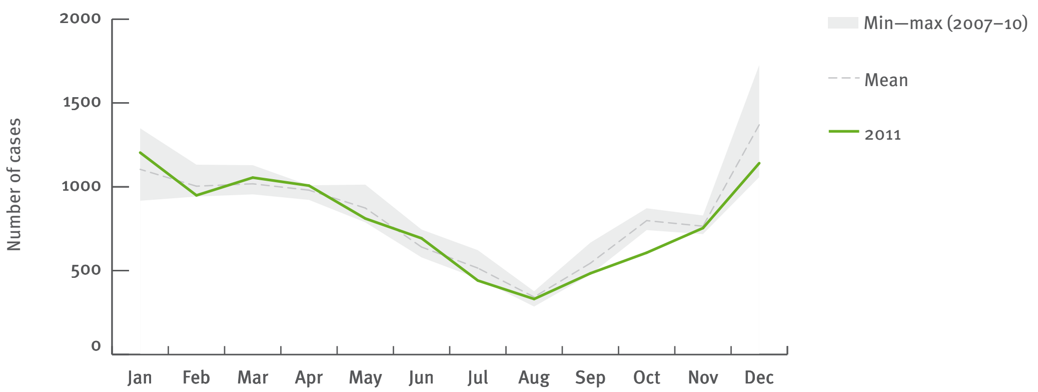
Figure 2.5.10. Seasonal distribution: Number of cases of invasive pneumococcal disease by month, EU/EEA, 2007–2011



Source: Country reports from Austria, Bulgaria, Denmark, Estonia, Finland, Hungary, Ireland, Luxembourg, Malta, the Netherlands, Norway, Slovakia, Slovenia, Sweden and the United Kingdom.

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by				National coverage	National reference laboratory data	Comparable data available	Case definition used
						Laboratories	Physicians	Hospitals	Others				
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Belgium	BE-REFLAB	V	Se	A	C	Y	N	N	N	Y	-	-	EU-2008
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	Y	-	-	EU-2008
Cyprus	CY-LABNET	V	Se	A	C	Y	N	N	N	N	-	-	Not specified/unknown
Czech Republic	CZ-NRL-STR	Cp	Co	A	C	Y	Y	Y	N	Y	-	-	EU-2008
Denmark	DK-MIS	Cp	Co	P	C	N	Y	N	N	Y	-	-	Other
Estonia	EE-PNEUMOCOCC	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Finland	FI-NIDR	Cp	Co	P	C	Y	N	N	N	Y	-	-	Not specified/unknown
France	FR-EPIBAC	V	Se	A	C	Y	N	Y	N	Y	-	-	EU-2008
Greece	GR-Notification/Laboratory data	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Hungary	HU-NRL_PNEU	V	Co	P	C	Y	N	N	N	Y	-	-	EU-2008
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Ireland	IE-PNEU	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Italy	IT-MENINGITIS	Cp	Co	P	C	N	Y	Y	N	Y	-	-	EU-2008
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU case definition (legacy/deprecated)
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Luxembourg	LU-SYSTEM1	V	Co	P	C	-	Y	N	N	-	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Netherlands	NL-OSIRIS	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	Not specified/unknown
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Romania	RO-RNSSy	Cp	Co	P	C	N	N	Y	N	Y	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y	-	-	EU-2008
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Spain	ES-NRL	V	O	P	C	Y	N	Y	N	-	-	-	Not specified/unknown
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
United Kingdom	UK-PNEUMOCOCCAL	O	Co	P	C	Y	N	Y	Y	Y	-	-	Other

Measles

- A total of 32 124 cases were reported in 2011, with an overall rate of 6.34 cases per 100 000 population; 13 836 cases were classified as confirmed (43.1%).
- Several countries reported outbreaks in 2011. The number of cases reported is similar to 2010, and remains high compared with previous years (2007–2009).
- A decrease in the number of reported cases was observed in 2012, but this is likely to be attributable to the dynamics of the transmission of infection in the population rather than a stable decline in the burden of the disease. If the number of susceptible persons increases, disease incidence is likely to follow, unless immediate public health action is taken. To interrupt the circulation of the virus, a vaccination coverage of at least 95% must be reached, with two doses of measles-containing vaccine through routine vaccination.
- Measles elimination remains a public health challenge in the WHO European Region despite several countries having renewed their commitment to the elimination of indigenous transmission of measles by 2015[1].
- Public health priorities include strengthening immunisation programmes, improving surveillance systems, and effective outbreak control[2].

Measles is a highly communicable disease caused by the measles virus. The disease is characterised by cough, coryza, fever, a maculopapular rash, and Koplik spots. Patients usually recover, but serious complications of the respiratory tract and central nervous system may occur. The infectious agent is measles virus which belongs to the genus *Morbillivirus* of the family *Paramyxoviridae*.

Epidemiological situation in 2011

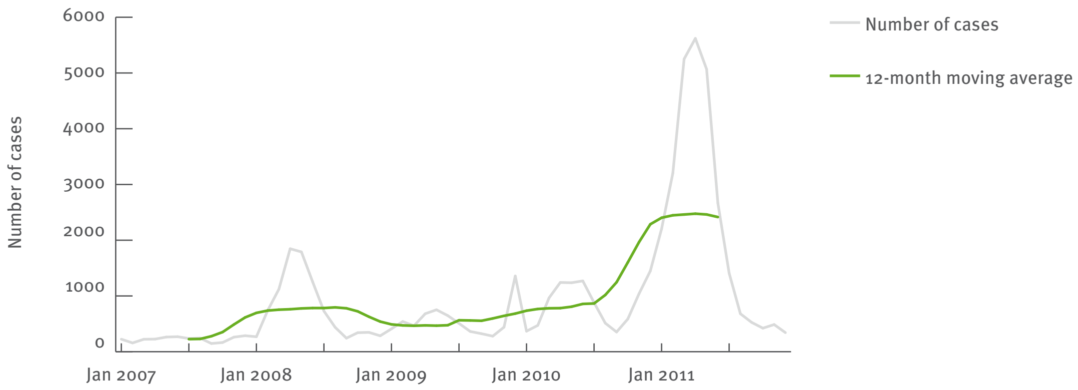
In 2011, 32 124 measles cases, including confirmed, possible and probable cases, were reported. A total of 13 836 cases were classified as confirmed (43.1%). A notification rate of 6.33 cases per 100 000 population was observed (Table 2.5.6). Six countries reported rates below one case per million population; a measles incidence rate of less than one confirmed case of measles per million population per year is the target for the elimination of the disease. France was the most affected country, accounting for 46.6% (14 966) of all cases in 2011. Several other countries reported a considerable amount of cases (including Germany, Italy, Romania, Spain, and the United Kingdom). The highest rates were reported by France (23.04 per 100 000 population), Romania (19.45 per 100 000), Italy (8.56 per 100 000) and Spain (7.62 per 100 000). Age standardised rates were higher for France and Romania.

The total number of reported cases is similar to 2010 but higher compared with 2007–2009 (Figure 2.5.11). Compared with 2009 (6 776 cases), a fivefold increase was observed.

Age and gender distribution

Age was reported in 31 639 cases (98.5%). The most affected age group was 0–4-year-olds (29.84 cases per 100 000), followed by 5–14-year-olds (15.62 per 100 000) and 15–24-year-olds (13.34 per 100 000). Gender was reported in 31 855 of all measles cases (99.5%). No important differences with regard to gender or age group were observed (Figure 2.5.12).

Figure 2.5.11. Trend and number of measles cases reported in the EU/EEA, 2007–2011



Source: Country reports from Austria, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Seasonality

In 2011, as in previous years, a seasonal pattern was observed. Infection occurred primarily in late winter and early spring. The monthly distribution of cases from 2007 to 2011 is presented in Figure 2.5.13.

Enhanced surveillance in 2011

Thirty-nine per cent of the cases were laboratory positive, and 60.3% were clinically diagnosed.

Importation status was available for 69.1% (22 206) of the cases; 2.3% (725) were imported from another country and 0.1% (35) were import-related. Vaccination status was known for 82% of the cases, and of these, 81.9% (21 502) were unvaccinated.

Eight measles-related deaths were reported by three countries: France (six deaths), Germany and Romania (one each). Twenty-three cases were complicated by acute encephalitis following the infection.

Updates for epidemic intelligence 2012

In 2012, measles continued to afflict most EU/EEA countries; 8 230 cases were reported (notification rate: 16.2 cases per million). France, Italy, Romania, Spain and the United Kingdom accounted for 94% of the cases in 2012. Only Iceland has not reported any cases over the last six years. The number of reported measles cases in 2012 in EU/EEA countries was lower than during 2010 and 2011 when several major outbreaks were reported in Europe. In 2012, no increase in the number of cases during the peak transmission season was reported and only a few minor outbreaks were detected. Overall, the number of cases in 2012 is comparable to the period before 2010.

Of the 7 754 cases with known vaccination status, the proportion of unvaccinated cases (83%) was high across all age groups. Among the 1–4-year-olds, the group targeted by routine childhood vaccination programmes, 77% of the cases were unvaccinated.

Table 2.5.6. Numbers and rates of measles cases reported in the EU/EEA, 2007–2011

Country	2011						2010		2009		2008		2007	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population			Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Crude rate	Age-standardised rate	Cases	Crude rate	Cases	Crude rate	Cases	Crude rate	Cases	Crude rate
Austria	Y	C	122	38	1.45	1.55	56	0.67	53	0.63	447	5.37	20	0.24
Belgium	Y	C	674	414	6.13	5.92	40	-	33	-	98	-	58	-
Bulgaria	Y	C	157	31	2.13	2.45	22 005	290.95	2 249	29.57	1	0.01	1	0.01
Cyprus	Y	C	0	0	0.00	0.00	18	2.20	0	0.00	1	0.13	0	0.00
Czech Republic	Y	C	17	17	0.16	0.16	0	0.00	5	0.05	2	0.02	2	0.02
Denmark	Y	C	84	77	1.51	1.46	5	0.09	8	0.15	12	0.22	2	0.04
Estonia	Y	C	7	7	0.52	0.51	0	0.00	0	0.00	0	0.00	1	0.07
Finland	Y	C	27	27	0.50	0.52	5	0.09	2	0.04	5	0.09	0	0.00
France	Y	C	14 966	4 991	23.04	22.30	5 019	7.77	1 544	2.40	604	0.94	41	0.06
Germany	Y	C	1 607	919	1.97	2.30	780	0.96	573	0.70	915	1.12	571	0.70
Greece	Y	C	40	35	0.35	0.37	149	1.32	2	0.02	1	0.01	2	0.02
Hungary	Y	C	5	5	0.05	0.05	0	0.00	1	0.01	0	0.00	0	0.00
Ireland	Y	C	267	146	5.84	4.47	403	9.02	193	4.34	56	1.27	52	1.21
Italy	Y	C	5 190	1 961	8.56	9.29	3 064	5.08	759	1.26	5 311	8.91	595	1.01
Latvia	Y	C	1	1	0.05	0.05	0	0.00	0	0.00	3	0.13	0	0.00
Lithuania	Y	C	7	7	0.23	0.24	2	0.06	0	0.00	1	0.03	0	0.00
Luxembourg	Y	C	6	6	1.17	1.09	0	0.00	0	0.00	0	0.00	0	0.00
Malta	Y	C	4	4	0.96	1.00	0	0.00	1	0.24	1	0.25	2	0.49
Netherlands	Y	C	50	35	0.30	0.31	15	0.09	15	0.09	109	0.66	10	0.06
Poland	Y	C	38	29	0.10	0.10	13	0.03	115	0.30	100	0.26	40	0.11
Portugal	Y	C	2	2	0.02	0.02	5	0.05	3	0.03	1	0.01	0	0.00
Romania	Y	C	4 165	1 774	19.45	20.07	188	0.88	8	0.04	14	0.07	352	1.63
Slovakia	Y	C	2	2	0.04	0.04	0	0.00	0	0.00	0	0.00	0	0.00
Slovenia	Y	C	22	22	1.07	1.07	2	0.10	0	0.00	0	0.00	0	0.00
Spain	Y	C	3 515	2 138	7.62	7.75	305	0.66	41	0.09	296	0.65	265	0.60
Sweden	Y	C	26	26	0.28	0.29	6	0.06	3	0.03	25	0.27	1	0.01
United Kingdom	Y	C	1 083	1 083	1.75	1.67	397	0.65	1 166	1.89	1 406	2.31	1 004	1.66
EU total	-	-	**32 084**	**13 797**	**6.40**	**6.53**	**32 477**	**6.63**	**6 774**	**1.38**	**9 409**	**1.92**	**3 019**	**0.61**
Iceland	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	40	39	0.81	0.70	3	0.06	2	0.04	4	0.08	20	0.43
Total	-	-	**32 124**	**13 836**	**6.34**	**6.46**	**32 480**	**6.56**	**6 776**	**1.37**	**9 413**	**1.90**	**3 039**	**0.61**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

Discussion

The number of cases reported in 2011 is similar to 2010 and remains high. Several countries reported outbreaks in 2011, while in 2010 most cases were reported from Bulgaria. A decrease was observed in 2012, most likely attributable to the dynamics of the transmission of infection in the population. To interrupt the circulation of the virus, vaccination coverage of at least 95% must be reached, with two doses of measles-containing vaccine through routine vaccination.

Measles elimination remains a challenge in the WHO European Region. In September 2010, WHO European Region countries renewed their commitment to the elimination of indigenous transmission of measles by 2015[1]. In addition to improving vaccination coverage (≥95% with two doses of vaccine), public health priorities include strengthened surveillance systems and effective outbreak control[2].

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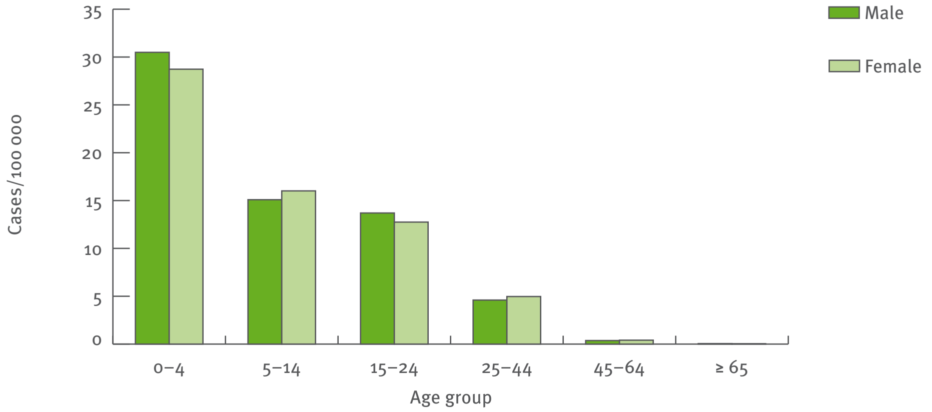
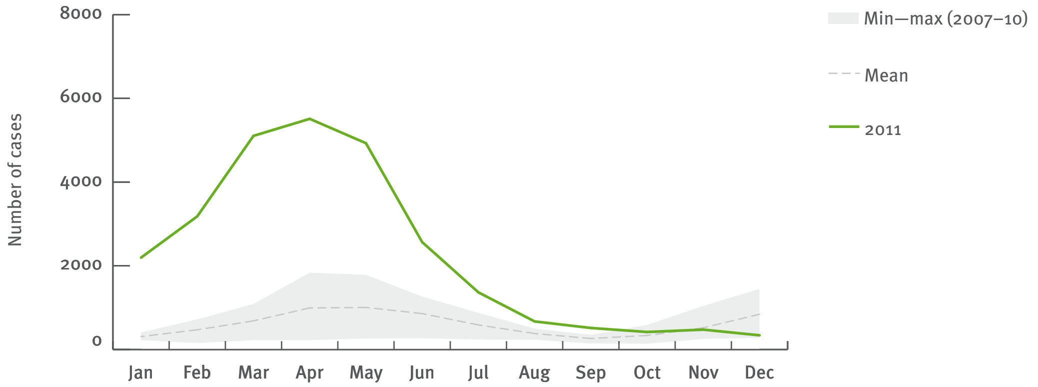
1. World Health Organization, Regional Committee for Europe. Renewed commitment to elimination of measles and rubella and prevention of congenital rubella syndrome by 2015 and sustained support for polio-free status in the WHO European Region. World Health Organization, Regional Office for Europe: Copenhagen; 2012.
2. World Health Organization, Regional Office for Europe. Strategic plan for measles and congenital rubella infection in the European Region of WHO. World Health Organization, Regional Office for Europe: Copenhagen; 2003.

Figure 2.5.12. Rates of measles cases reported in the EU/EEA, by age and gender, 2011



Source: Country reports from Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Figure 2.5.13. Seasonal distribution: Number of cases of measles by month, EU/EEA, 2007–2011



Source: Country reports from Austria, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by				National coverage	National reference laboratory data	Comparable data available	Case definition used
						Laboratories	Physicians	Hospitals	Others				
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Belgium	BE-PEDI_NRC_FLA_FRA	-	-	-	-	-	-	-	-	-	-	-	Not specified/unknown
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y	-	-	EU-2008
Denmark	DK-MIS	Cp	Co	P	C	N	Y	N	N	Y	-	-	Other
Estonia	EE-MEASLES_POLIO	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Finland	FI-NIDR	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
France	FR-MANDATORY_INFECTIOUS_DISEASES	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	Not specified/unknown
Germany	DE-SURVNET@RKI-7.1/6	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	Other
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Hungary	HU-EFRIR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Ireland	IE-CIDR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Italy	IT-MEASLES	Cp	Co	P	C	N	Y	Y	N	Y	-	-	EU-2008
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU case definition (legacy/deprecated)
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	-	Y	N	N	-	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Netherlands	NL-OSIRIS	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	Not specified/unknown
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Portugal	PT-Historical_EUVACNET	-	-	-	-	-	-	-	-	-	-	-	Not specified/unknown
Portugal	PT-MEASLES	Cp	Co	P	C	Y	Y	N	N	Y	Y	1987	Other
Romania	RO-RNSSy	Cp	Co	P	C	N	N	Y	N	Y	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y	-	-	EU-2008
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Spain	ES-STATUTORY_DISEASES	Cp	Co	P	C	N	Y	Y	N	Y	-	-	EU-2008
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
United Kingdom	UK-MEASLES	O	Co	P	C	Y	N	Y	Y	Y	-	-	Other

Mumps

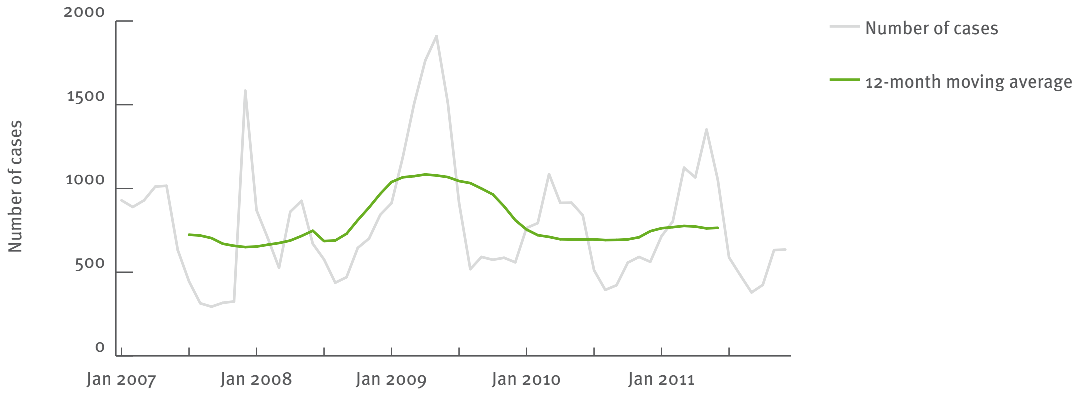
- Despite decades of vaccination, mumps cases and outbreaks of mumps still occur in Europe.
- As in previous years, the age group most affected was 15–24-year-olds.
- The highest rates were reported from the Czech Republic, Poland, Spain and the United Kingdom.
- Fifty-seven per cent of notified mumps cases had received at least one dose of mumps-containing vaccine.
- The current epidemiology of mumps in Europe may be largely explained by waning immunity and a growing susceptible population.
- Booster vaccination strategies among adolescents and young adults may be indicated.

Mumps is an infection caused by the mumps virus of the genus *Paramyxovirus* and characterised by fever and parotitis. Common complications are meningitis, pancreatitis and, in adolescent males, orchitis. Rarely, neurological symptoms and residual hearing loss may occur. Mumps outbreaks are still relatively frequent, although the disease is vaccine preventable and the vaccine is included in the primary vaccination schedule of all EU/EEA Member States.

Epidemiological situation in 2011

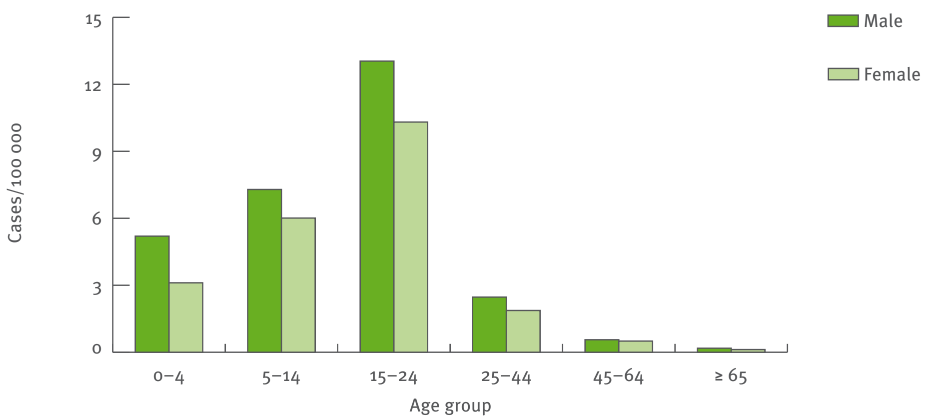
A total of 12 362 cases of mumps were reported in 2011 by 23 EU/EEA countries, with an overall notification rate of 3.5 per 100 000 population (2010: 3.4 per 100 000). The percentage of reported confirmed cases was almost 50% (n=6 120). The overall trend in notifications between 2007 and 2011 shows a decrease from 6.9 to 3.5 cases per 100 000 population.

Figure 2.5.14. Trend and number of cases of mumps reported in the EU/EEA, 2007–2011



Source: Country reports from Cyprus, the Czech Republic, Denmark, Estonia, Finland, Greece, Hungary, Ireland, Italy, Lithuania, the Netherlands, Norway, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Figure 2.5.15. Rates of cases of mumps reported in the EU/EEA, by age and gender, 2011



Source: Country reports from Austria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, the Netherlands, Norway, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

The highest rates of notified cases were reported by the Czech Republic (27.5 cases per 100 000 population), Poland (6.7), Spain (4.4), the United Kingdom (4.4) and the Netherlands (3.9); these countries accounted for more than 87% of all cases (Table 2.5.7). None of the Polish cases was confirmed. Cyprus, Iceland, Luxembourg and Malta reported zero cases, while France, Germany and Liechtenstein did not report. Belgium has no national surveillance of mumps and was therefore not included in the analysis of notification rates.

Age and gender distribution

Age was reported in 9 588 cases (77.6%). Mumps occurred in all age groups; however, adolescents and young adults between 15 and 24 years of age (11.7 cases per 100 000 population) were the most affected, followed by 5–14-year-olds (6.6) and 0–4-year-olds (4.2). This is in line with findings from previous years.

Of the 12 235 cases (98.9%) for which gender was reported, 6 983 cases (57%) were male and 5 252 (43%) were female. The male-to-female ratio was 1.41. Higher notification rates were reported for males in all age groups (Figure 2.5.15).

Seasonality

The month of reporting was available for 12 322 cases (99.7%). As in the previous four years, the numbers of reported cases peaked in May, whereas the lowest numbers were reported during summer and early autumn (Figure 2.5.16). Contrary to previous years, the early winter of 2011 saw no steep increase in cases of mumps.

Enhanced surveillance in 2011

Enhanced surveillance data showed 8 885 cases (71.9%) with notified vaccination status, 5 036 (57%) of which were vaccinated with at least one dose, while 3 849 (43%) had not received any vaccination.

Outcome was reported in almost all cases, and no case had died in 2011. Of 6 694 cases with known hospitalisation status, 468 (7.0%) were hospitalised and 371 (5.1%)

Table 2.5.7. Numbers and rates of cases of mumps reported in the EU/EEA, 2007–2011

Country	2010						2009		2008		2007		2006	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population			Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Crude rate	Age-standardised rate	Cases	Crude rate	Cases	Crude rate	Cases	Crude rate	Cases	Crude rate
Austria	Y	C	25	25	0.30	0.31	15	0.18	14	0.17	22	0.26	7	0.09
Belgium	N	A	15	15	-	-	30	-	43	-	50	-	68	-
Bulgaria	Y	C	139	20	1.89	2.12	317	4.19	1111	14.61	5582	73.06	5299	69.00
Cyprus	Y	C	0	0	0.00	0.00	2	0.24	5	0.63	3	0.38	5	0.64
Czech Republic	Y	C	2885	1041	27.51	30.07	1068	10.17	357	3.41	402	3.87	1297	12.61
Denmark	Y	C	13	13	0.23	0.24	32	0.58	17	0.31	24	0.44	12	0.22
Estonia	Y	C	8	2	0.60	0.60	13	0.97	11	0.82	14	1.04	18	1.34
Finland	Y	C	2	2	0.04	0.04	4	0.08	1	0.02	5	0.09	6	0.11
France	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Germany	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Greece	Y	C	1	0	0.01	0.01	2	0.02	20	0.18	5	0.05	23	0.21
Hungary	Y	C	5	5	0.05	0.05	0	0.00	5	0.05	14	0.14	16	0.16
Ireland	Y	C	73	70	1.60	1.59	120	2.69	1832	41.17	932	21.18	70	1.62
Italy	Y	C	758	758	1.25	1.43	812	1.35	1103	1.84	1387	2.33	1312	2.22
Latvia	Y	C	10	5	0.48	0.49	3	0.13	1	0.04	6	0.26	4	0.18
Lithuania	Y	C	64	64	2.10	2.16	87	2.61	74	2.21	82	2.44	81	2.39
Luxembourg	Y	C	0	0	0.00	0.00	-	-	25	5.07	28	5.79	0	0.00
Malta	Y	C	0	0	0.00	0.00	2	0.48	0	0.00	7	1.71	2	0.49
Netherlands	Y	C	642	530	3.86	4.01	424	2.56	32	0.19	7	0.04	0	0.00
Poland	Y	A	2585	0	6.71	6.25	2754	7.22	2954	7.75	3271	8.58	4147	10.88
Portugal	Y	C	134	7	1.30	1.38	140	1.34	154	1.48	140	1.34	191	1.83
Romania	Y	C	202	5	0.94	0.98	242	1.13	741	3.45	2302	10.69	5291	24.54
Slovakia	Y	C	2	2	0.04	0.04	2	0.04	5	0.09	5	0.09	5	0.09
Slovenia	Y	C	4	2	0.20	0.22	5	0.24	27	1.33	32	1.59	19	0.95
Spain	Y	C	2027	794	4.39	4.73	1351	2.94	1114	2.43	2607	5.76	3147	7.08
Sweden	Y	C	38	30	0.40	0.41	24	0.26	32	0.35	51	0.56	47	0.52
United Kingdom	Y	C	2714	2714	4.38	4.23	4383	7.12	7946	12.90	2644	4.35	2702	4.48
EU total	**-**	**-**	**12346**	**6104**	**3.59**	**3.62**	**11832**	**3.45**	**17624**	**5.14**	**19622**	**5.76**	**23769**	**7.01**
Iceland	Y	C	0	0	0.00	0.00	2	0.63	4	1.25	0	0.00	1	0.33
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	16	16	0.33	0.32	12	0.25	12	0.25	16	0.34	23	0.49
Total	**-**	**-**	**12362**	**6120**	**3.54**	**3.57**	**11846**	**3.40**	**17640**	**5.07**	**19638**	**5.68**	**23793**	**6.92**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

developed complications. Orchitis was the most frequent complication (61%), followed by meningitis (15%).

Updates for epidemic intelligence

The Czech Republic (n=3 052), Spain (n=3 600) and Ireland (n=93) reported in EPIS (Epidemic Intelligence Information System) an increased number of cases due to outbreaks in the first six month of 2012, compared with the same period in 2011.

Discussion

The interpretation of the overall trend is difficult as TESSy methodology has been changing over the years: the way case definitions were handled and the description of case classifications varied over the years; also, the case confirmation is strongly influenced by surveillance system functionality in the Member States.

Based on the available data, the overall trend in notifications decreased between 2007 and 2011 from 6.9 to 3.5 cases per 100 000 population. However, high numbers of cases continue to be notified in the Czech Republic, Spain and the United Kingdom[12] despite the high vaccine coverage reported (EPIS report).

The highest reported rates were observed in the 15–24-year-old age group. Waning immunity and low vaccine coverage have been suggested as reasons for this shift[13]. Enhanced surveillance continues to show a high number of individuals with breakthrough infections after one or more doses of mumps-containing vaccine.

Revaccination during adolescence to combat waning immunity might be the most effective measure[14].

Little is known about the severity of disease in the age groups that are mainly affected, but according to ECDC data and the literature on this topic, complications are more frequently reported in young adults than in children. In general, the clinical severity of the disease in previously vaccinated persons is lower than in non-vaccinated individuals[15]. The protective effect of vaccination on disease severity is critical and should be considered in current and future mumps prevention and control strategies[16].

Further research into waning immunity to mumps virus is needed in order to improve future immunisation programmes. Meanwhile, maintaining a high coverage with two doses of measles, mumps and rubella (MMR) vaccine should be a priority. Since all European countries use MMR vaccines in their national childhood immunisation programmes, mumps prevention benefits indirectly from the efforts made to reach the WHO measles elimination goal by 2015.

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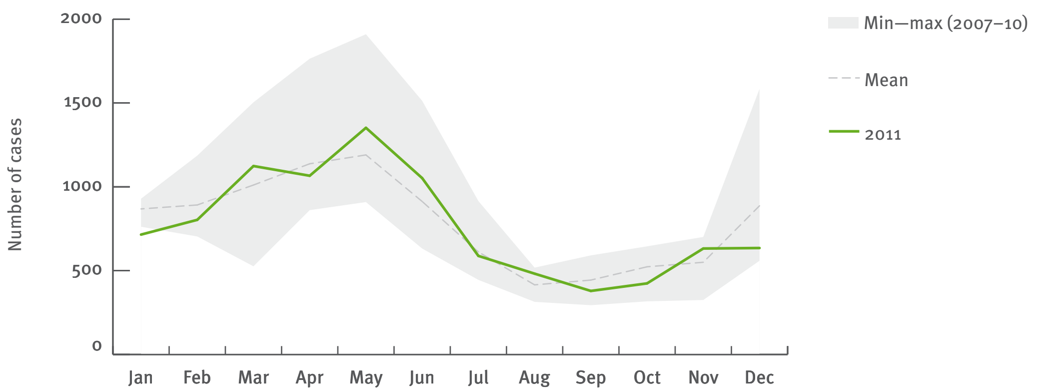
Figure 2.5.16. Seasonal distribution: Number of cases of mumps by month, EU/EEA, 2007–2011



Source: Country reports from Cyprus, the Czech Republic, Denmark, Estonia, Finland, Greece, Hungary, Ireland, Italy, Lithuania, the Netherlands, Norway, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

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Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by				National coverage	National reference laboratory data	Comparable data available	Case definition used
						Laboratories	Physicians	Hospitals	Others				
Austria	AT-Reflab	V	O	P	C	Y	N	N	N	Y	-	-	EU-2008
Belgium	BE-PEDISURV	V	Se	A	C	Y	Y	Y	Y	Y	-	-	Not specified/unknown
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y	-	-	EU-2008
Denmark	DK-MIS	Cp	Co	P	C	N	Y	N	N	Y	-	-	Other
Estonia	EE-MUMPS	Cp	Co	P	C	N	Y	Y	Y	Y	-	-	EU case definition (legacy/deprecated)
Finland	FI-NIDR	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Hungary	HU-EFRIR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Ireland	IE-CIDR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2002
Italy	IT-NRS	Cp	Co	P	C	N	Y	Y	N	Y	-	-	Other
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU case definition (legacy/deprecated)
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	-	Y	N	N	-	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Netherlands	NL-OSIRIS	Cp	Co	P	C	Y	Y	N	Y	Y	-	-	EU-2008
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	Not specified/unknown
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	N	Y	Y	N	Y	-	-	Other
Portugal	PT-MUMPS	Cp	Co	P	C	N	Y	N	N	-	-	-	Other
Romania	RO-RNSSy	Cp	Co	P	A	N	N	Y	N	Y	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y	-	-	EU-2008
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Spain	ES-STATUTORY_DISEASES	Cp	Co	P	C	N	Y	Y	N	Y	-	-	EU-2008
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
United Kingdom	UK-MUMPS	O	Co	A	C	Y	N	Y	Y	Y	-	-	Other

Pertussis

- The notification rate of pertussis cases increased for the first time since 2008. The overall total case rate in 2011 was 5.57 cases per 100 000 population.
- Young children and adolescents were the most affected age groups, although increases were seen across all age groups.
- Vaccine strategies should be revisited and consideration given to adolescent and adult boosters, as well as to vaccinations for healthcare workers and pregnant women, as these measures are essential for prevention.

Pertussis (whooping cough) is a highly contagious acute respiratory infection caused by the bacterium *Bordetella pertussis*. The incubation period is 9–10 days (range 6–20 days). Patients develop catarrhal symptoms including cough. In the course of 1–2 weeks, coughing paroxysms ending in the characteristic whoop may occur, especially in unvaccinated children. Pertussis is an endemic disease, with sporadic outbreaks and epidemic peaks every 2–5 years.

Epidemiological situation in 2011

In 2011, 19 743 (16 897 confirmed) cases were reported by 27 EU/EEA countries, 25 of which have national surveillance systems. Iceland reported zero cases, while

Table 2.5.8. Numbers and rates of total pertussis cases reported in the EU/EEA, 2007–2011

Country	2011						2010		2009		2008		2007	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population			Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Crude rate	Age-standardised rate	Cases	Crude rate	Cases	Crude rate	Cases	Crude rate	Cases	Crude rate
Austria	Y	C	310	109	3.69	3.75	236	2.82	2	0.02	175	2.10	136	1.64
Belgium	N	C	233	233	-	-	100	-	160	-	174	-	214	-
Bulgaria	Y	A	46	35	0.62	0.69	54	0.71	251	3.30	193	2.53	269	3.50
Cyprus	Y	C	2	1	0.24	0.22	0	0.00	8	1.00	3	0.38	9	1.16
Czech Republic	Y	C	324	310	3.09	3.43	661	6.29	954	9.11	765	7.37	185	1.80
Denmark	Y	C	443	443	7.97	7.54	450	8.13	632	11.47	619	11.30	549	10.08
Estonia	Y	C	478	471	35.67	36.33	1 295	96.63	629	46.93	485	36.17	409	30.47
Finland	Y	C	555	555	10.33	10.45	343	6.41	267	5.01	1 022	19.28	480	9.10
France	N	C	73	71	-	-	50	-	83	-	56	-	61	0.10
Germany	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Greece	Y	C	3	2	0.03	0.00	64	0.57	27	0.24	22	0.20	29	0.26
Hungary	Y	C	9	9	0.09	0.09	25	0.25	33	0.33	33	0.33	48	0.48
Ireland	Y	C	229	113	5.01	3.89	114	2.55	78	1.75	104	2.36	78	1.81
Italy	Y	C	348	348	0.57	0.65	412	0.68	638	1.06	336	0.56	795	1.34
Latvia	Y	C	10	2	0.48	0.51	9	0.40	9	0.40	14	0.62	27	1.18
Lithuania	Y	C	30	24	0.98	1.00	19	0.57	233	6.96	51	1.52	17	0.50
Luxembourg	Y	C	4	4	0.78	0.76	0	0.00	1	0.20	2	0.41	4	0.84
Malta	Y	C	26	14	6.25	6.33	2	0.48	0	0.00	1	0.25	0	0.00
Netherlands	Y	C	5 450	5 447	32.72	32.15	3 733	22.52	6 461	39.19	8 745	53.31	7 374	45.08
Poland	Y	C	1 669	678	4.33	4.38	1 266	3.32	2 390	6.27	2 163	5.68	1 987	5.21
Portugal	Y	C	32	32	0.31	0.34	14	0.13	64	0.61	72	0.69	21	0.20
Romania	Y	C	86	75	0.40	0.42	29	0.14	10	0.05	51	0.24	35	0.16
Slovakia	Y	C	936	936	17.36	16.70	1 378	25.41	288	5.32	105	1.94	21	0.39
Slovenia	Y	C	284	176	13.85	15.85	611	29.85	441	21.70	182	9.05	708	35.22
Spain	Y	C	2 325	1 013	5.04	4.41	714	1.55	473	1.03	613	1.35	151	0.34
Sweden	Y	C	177	172	1.88	1.81	263	2.82	281	3.04	459	5.00	690	7.57
United Kingdom	Y	C	1 256	1 256	2.03	1.95	366	0.59	852	1.38	1 051	1.73	1 038	1.72
EU total	**-**	**-**	**15 338**	**12 529**	**4.37**	**4.49**	**12 208**	**3.52**	**15 265**	**4.39**	**17 496**	**5.08**	**15 335**	**3.77**
Iceland	Y	C	0	0	0.00	0.00	0	0.00	0	0.00	1	0.32	2	0.65
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	4 405	4 368	89.53	87.10	3 560	73.28	5 544	115.52	3 887	82.05	5 373	114.78
Total	**-**	**-**	**19 743**	**16 897**	**5.57**	**5.75**	**15 768**	**4.49**	**20 809**	**5.92**	**21 384**	**6.13**	**20 710**	**5.04**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

Germany and Liechtenstein did not report any data. Belgium and France reported data from sentinel surveillance and were not included in the notification rates analysis. The overall total case rate remains low at 5.57 per 100 000 population, an increase compared with 2010, but comparable with the rates observed from 2007 to 2009 (Table 2.5.8, Figure 2.5.17).

Norway reported the highest confirmed case rate, with 89.5 cases per 100 000 population. Estonia and the Netherlands followed with 35.7 and 32.7 cases per 100 000, respectively. Of all countries, Estonia observed the largest decrease from 2010, when 96.6 cases per 100 000 were reported, reflecting a return to levels similar to 2007–2009. Other notable decreases in notification rate were observed in the Czech Republic, Slovakia and Slovenia. Substantial increases in cases numbers were reported by Finland, Ireland, Malta, the Netherlands, Norway and Spain (Table 2.5.8).

The Netherlands reported the highest total number of cases (n=5 450), representing 28.1% of the total EU/EEA reported number of cases, followed by Norway (n=4 405, 22.7%). These two countries have contributed at least 47% of the total number of pertussis cases since 2007 (Table 2.5.8).

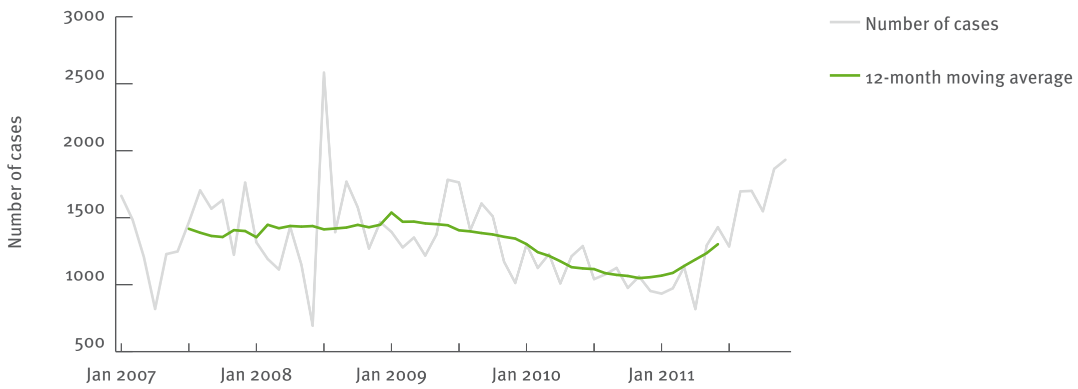
Age and gender distribution

In 2011, the notification rate of pertussis decreased with increasing age. The age group most affected in countries with higher case rates was the 5–14-year-olds (15 cases per 100 000 population); however, when taking into account all countries, the 0–4-year-olds were the most affected age group (15.8), as a few less affected countries exhibited significantly higher rates in this age group (Denmark, Ireland and Spain) (Figure 2.5.18). This may also be attributed to a steep increase in notification rates in children below one year of age when compared with 2010 (20.3 in 2010, 38.5 in 2011). Notification rates in older age groups were low in all counties, except Norway and the Netherlands. There were higher rates among women than men across all ages (Figure 2.5.18). Across all the age groups, females (5.8 per 100 000) were slightly more often affected than males (5.0 per 100 000), with a male-to-female ratio of 0.82:1.

Seasonality

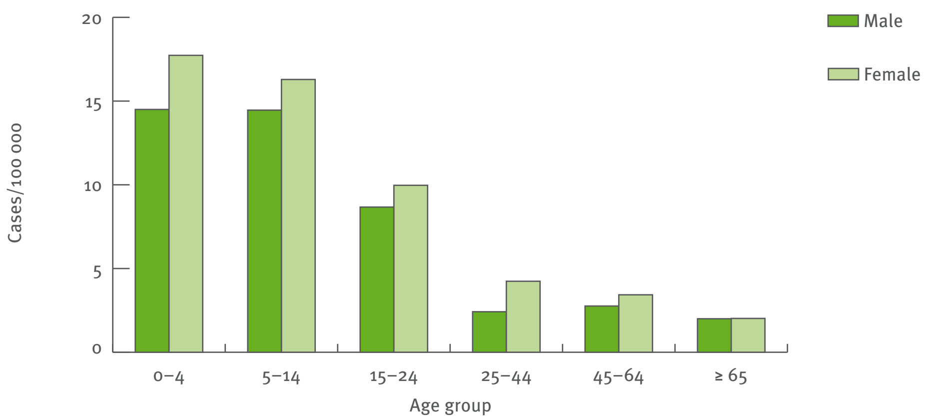
In 2011, reported pertussis cases did not display any seasonal patterns. The lowest numbers were reported in April; numbers then gradually increased, reaching a high in December. This trend is inconsistent with the years

Figure 2.5.17. Trend and number of total pertussis cases reported in the EU/EEA, 2007–2011



Source: Country reports from Cyprus, the Czech Republic, Denmark, Estonia, Greece, Hungary, Iceland, Ireland, Italy, the Netherlands, Norway, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Figure 2.5.18. Rates of total pertussis cases reported in the EU/EEA, by age and gender, 2011



Source: Country reports from Cyprus, the Czech Republic, Denmark, Estonia, Greece, Hungary, Iceland, Ireland, Italy, the Netherlands, Norway, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

2007–2010, where peaks in cases occurred around July, after which numbers decreased again (Figure 2.5.19).

Discussion

In 2011, the number of cases of pertussis increased, as did the overall notification rate – for the first time since 2008. Notification rates varied widely among countries, ranging from 0.2 to 89.5 per 100 000, with northern European countries (Estonia, Norway, the Netherlands and Finland) and central European countries (Slovakia and Slovenia) displaying higher case rates.

Comparisons between countries should be made with caution because of variations between surveillance systems and different degrees of awareness in the reporting of the disease. Young children and adolescents were the most affected age groups, although increases were seen across all age groups, most notably in those under one year of age.

The increased incidence of pertussis may be the sum of different factors: increased awareness of the disease, improvements in diagnostic and reporting methods, waning immunity in older age groups, and incomplete vaccination. Strain adaptation, or the potential emergence of more virulent strains, may have reduced the effectiveness of some pertussis vaccines[1,2].

It is important to be aware that pertussis infection is no longer solely a paediatric infection: case numbers are on the rise in adolescents, adults, and children too young to be vaccinated[3]. Waning immunity after vaccination and an absence of natural boosters is contributing to a lack of immunity in adolescents and adults, despite high vaccination coverage in younger age groups. This may create a pool of susceptible people who can act as a source of transmission and contribute to rising incidence rates and outbreaks[4]. Vaccine strategies should be revisited and consideration given to adolescent and adult boosters, as well as to vaccinations for healthcare workers and pregnant women, as these measures are essential for prevention[5,6]. Countries that have added an adolescent pertussis booster vaccine to their vaccination schedule include Austria, Belgium, Finland, France, Germany and Italy[7], with Sweden to follow suit in 2016.

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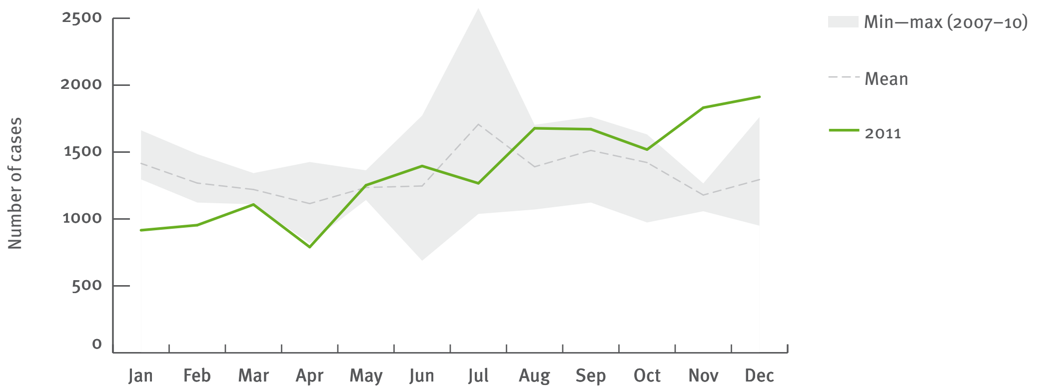
Figure 2.5.19. Seasonal distribution: Number of total pertussis cases by month, EU/EEA, 2007–2011



Source: Country reports from Cyprus, the Czech Republic, Denmark, Estonia, Greece, Hungary, Iceland, Ireland, Italy, the Netherlands, Norway, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by: Laboratories	Physicians	Hospitals	Others	National coverage	National reference laboratory data	Comparable data available	Case definition used
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Belgium	BE-REFLAB	V	Se	A	C	Y	N	N	N	Y	-	-	Not specified/unknown
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	Y	-	-	EU-2008
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y	-	-	EU-2008
Denmark	DK-LAB	Cp	Co	P	C	Y	N	N	N	Y	-	-	EU-2008
Denmark	DK-MIS	Cp	Co	P	C	N	Y	N	N	Y	-	-	Other
Estonia	EE-PERTUSSIS/SHIGELLOSIS/SYPHILIS	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Finland	FI-NIDR	Cp	Co	P	C	Y	N	N	N	Y	-	-	Not specified/unknown
France	FR-RENACOQ	V	Se	A	C	Y	Y	Y	N	N	-	-	Not specified/unknown
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Hungary	HU-EFRIR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Ireland	IE-CIDR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Italy	IT-NRS	Cp	Co	P	C	N	Y	Y	N	Y	-	-	Other
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU case definition (legacy/deprecated)
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	-	Y	N	N	-	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Netherlands	NL-OSIRIS	Cp	Co	P	C	Y	Y	N	Y	Y	-	-	EU-2008
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	Not specified/unknown
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Portugal	PT-PERTUSSIS	Cp	Co	P	C	N	Y	N	N	-	-	-	Other
Romania	RO-RNSSy	Cp	Co	P	C	N	N	Y	N	Y	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y	-	-	EU-2008
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Spain	ES-STATUTORY_DISEASES	Cp	Co	P	C	N	Y	Y	N	Y	-	-	EU-2008
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
United Kingdom	UK-PERTUSSIS	O	Co	P	C	Y	N	Y	Y	Y	-	-	Other

Polio

- The WHO European Region was declared polio-free in 2002; neither wild-type nor vaccine-type associated poliomyelitis cases were reported in EU/EEA countries in 2011.
- Inactivated poliovirus vaccines are used in all EU/EEA countries, except Poland where live oral poliovirus vaccine (OPV) is still used for the fourth dose. OPV is still used in a majority of countries worldwide and can cause vaccine-associated paralytic polio (VAPP).
- India has been polio-free since January 2011. Polio remains endemic in three countries – Afghanistan, Nigeria and Pakistan and has re-established transmission in three countries which were previously polio-free (Angola, Chad, and Democratic Republic of the Congo). Several more countries had ongoing outbreaks in 2011 due to importations of poliovirus.
- Imported wild-type and vaccine-type polioviruses still remain a threat to unvaccinated European populations. Maintaining high coverage in all population groups and continued clinical and/or environmental surveillance remain the most important tools for keeping Europe polio-free.

Poliomyelitis is an acute viral infection of the nervous system, caused by poliovirus types 1, 2 and 3; humans are the only reservoir of infection. Prior to vaccination, poliomyelitis was a common childhood disease, able to cause permanent paralysis and sometimes death. The WHO European Region was declared polio-free in 2002.

All vaccination schedules in EU/EEA countries specify the use of inactivated poliovirus vaccines containing all three serotypes, with the exception of Poland, where the fourth dose of vaccination is offered as oral poliovirus vaccine (OPV).

Polio disease may result from infection with wild poliovirus (WPV) or vaccine-derived polioviruses (VDPV). The latter originate from the viruses contained in the OPV vaccine, which have acquired neurovirulence and transmissibility characteristics of WPV by mutation. Vaccine-associated polio paralysis (VAPP) is a very rare event following immunisation with the attenuated formulation. Disease resulting from WPD, VDPV or VAPP is reportable at the European level.

Epidemiological situation in 2011

No cases of poliomyelitis disease were reported in any of the 29 reporting EU/EEA countries in 2011. There was no report from Liechtenstein.

Enhanced surveillance in 2011

The European Regional Commission for the Certification of Poliomyelitis Eradication (RCC) reviews the annual reports from all countries in the WHO European Region. The following risk factors for reintroduction and transmission after importation are assessed: health system, routine immunisation coverage, presence of high risk groups or pockets of susceptible individuals, surveillance indicators, and existence of a preparedness plan.

While clinical surveillance is considered the gold standard for certification purposes, other surveillance strategies may complement it, especially in countries that have been non-endemic for a long time. Eight EU/EEA countries do not report acute flaccid paralysis, and instead rely on high-quality enterovirus and/or environmental surveillance (e.g. screening of sewage water samples) to detect poliovirus.

According to evidence presented by the Member States to the RCC on 26 June 2012 (2011 data), there was no evidence of wild poliovirus transmission in the WHO European Region in 2011. However, Austria, Greece and Poland were classified as high-risk countries for polio spread after importation[1].

The Global Polio Laboratory Network (GPLN), comprising 145 laboratories and operating in all EU/EEA countries and all WHO Regions, performs laboratory surveillance for wild-type and vaccine-type polioviruses, with samples from patients with acute flaccid paralysis and from sewage water. The GPLN evaluates progress towards polio eradication[2].

Discussion

Global eradication of polio is now in sight. Since 13 January 2011, India has neither reported any cases of wild poliovirus nor detected the virus in sewage samples, and seems to have interrupted transmission of indigenous wild poliovirus.

Polio remains endemic in three countries – Afghanistan, Nigeria and Pakistan – and has re-established itself in three countries which were previously polio-free (Angola, Chad and Democratic Republic of the Congo). Several countries reported ongoing outbreaks in 2011 due to importations of poliovirus[3].

The importation of poliovirus to polio-free regions cannot be ruled out while poliovirus is still circulating, and importation of cases into polio-free areas like the European Union remains a potential threat. Also, transmission after re-introduction may occur if pockets of susceptible people exist, as could be seen in the 2010 polio outbreak in Tajikistan[4].

Several EU countries have identified vaccine-derived poliovirus strains in their sewage water, either from newly vaccinated visitors, immigrants, or chronic carriers in countries that have shifted to IPV. Travellers to endemic areas should be adequately counselled, also in view of the fact that data on national vaccination coverage may not accurately reflect the situation at the subnational level.

Vaccine-associated polio paralysis continues to be a risk, although very small, in countries using OPV vaccination as part of their routine vaccination programmes. The risk is strongly reduced by the previous administration of three doses of inactivated vaccine.

High immunisation coverage in all population groups is essential. Immunisation gaps, especially in vulnerable or hard to reach groups should be avoided. In many European countries there may be population pockets with lower vaccination coverage, where introduction of poliovirus could lead to transmission after importation. Maintaining high coverage and continued clinical and environmental surveillance remain the most important tools for keeping Europe polio-free.

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Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by				National coverage	National reference laboratory data	Comparable data available	Case definition used
						Laboratories	Physicians	Hospitals	Others				
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Belgium	BE-PEDISURV	V	Co	A	C	Y	Y	Y	Y	Y	-	-	Not specified/unknown
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	Y	-	-	EU-2008
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y	-	-	EU-2008
Denmark	DK-MIS	Cp	Co	P	C	N	Y	N	N	Y	-	-	Other
Finland	FI-NIDR	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
France	FR-MANDATORY_INFECTIOUS_DISEASES	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	Not specified/unknown
Germany	DE-SURVNET@RKI-7.1/6	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	Other
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Hungary	HU-EFRIR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Ireland	IE-CIDR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Italy	IT-NRS	Cp	Co	P	C	N	Y	Y	N	Y	-	-	EU-2008
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU case definition (legacy/deprecated)
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Netherlands	NL-OSIRIS	Cp	Co	P	C	Y	Y	N	Y	Y	-	-	EU-2008
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	Not specified/unknown
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	A	C	Y	Y	Y	N	Y	-	-	EU-2008
Portugal	PT-POLIMYELITIS	Cp	Co	P	C	Y	Y	N	N	Y	Y	1939	Other
Romania	RO-RNSSy	Cp	Co	P	C	N	N	Y	N	Y	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y	-	-	EU-2008
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Spain	ES-STATUTORY_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
United Kingdom	UK-POLIMYELITIS	O	Co	P	C	Y	N	Y	Y	Y	Y	-	EU case definition (legacy/deprecated)

Rabies

- In 2011, one imported human rabies cases was reported by Portugal; another imported case occurred in Italy.
- The rabies virus remains endemic in wild and domestic animals in some areas in Bosnia-Herzegovina, Croatia, Lithuania, Poland, Romania, Serbia, and Turkey.

Rabies is a frequently fatal infection caused by the rabies virus, which can infect all warm-blooded species and is hosted by a wide range of domestic and wild animals. The virus is found in the saliva of infected animals and is usually transmitted by animal bites. Preventive measures include oral vaccination of wildlife and domestic animals. Timely prophylaxis in case of exposure to a potentially infected animal is of utmost importance, and knowledge of the epidemiological situation is vital to make decisions with regard to appropriate post-exposure measures[1]. Treatment consists of local wound care, vaccination and, if indicated, passive immunisation with immunoglobulin. To be effective, treatment has to occur as soon as possible after exposure.

Epidemiological situation in 2011

In 2011, one confirmed human case of rabies was reported to TESSy from Portugal; in 2010, two cases from Romania were reported. The number of reporting EU/EEA countries was 29; Liechtenstein did not report. Consultation of the Rabies Bulletin Europe database[4] yielded one additional case from Italy.

The case from Portugal involved a woman who had travelled from Portugal to Bissau, Guinea-Bissau, in April 2011, where she was bitten by a dog on 1 May. She was diagnosed with rabies on 26 July and died two weeks later, despite treatment following the Milwaukee protocol[2].

In October 2011, an Indian man living in Italy was admitted to a hospital in Mantua, Italy, with symptoms of acute encephalitis. The man had received incomplete post-exposure treatment for rabies (vaccination but no immunoglobulin) in India, after having been bitten by a suspected rabid dog. The patient died after 22 days of intensive-care treatment, and rabies was confirmed post mortem[3].

Updates from epidemic intelligence in 2012

The Rabies Bulletin Europe and a ProMED report from March 2012 mention the case of a five-year-old girl bitten by a stray dog in a village in eastern Romania who was initially misdiagnosed; she died in February 2012[4]. A British woman died of rabies in the United Kingdom in May 2012, contracted from a dog in India[4]. Another case was reported from Switzerland: a US citizen, who probably contracted the disease in July 2012, after previous exposure to a bat in the USA[4].

Discussion

The rabies virus remains endemic in wildlife and domestic animals in some parts of Europe. In 2011, 549 cases of rabies (2010: 932 cases) were reported in animals in the EU/EEA: 136 in domestic animals, 381 in wild animals, and 32 in bats[4]. The majority of domestic and wild animal cases were reported from Romania, Poland and Lithuania, while bat cases were most often found in France, Germany, and the Netherlands. Croatia is also strongly affected by rabies in domestic and wild animals[4].

Rabies has also reoccurred in animals in northern Greece, after a reported absence of 25 years; five rabid animals were reported between 15 October and 14 December 2012. The two affected provinces border Albania on the west and the former Yugoslav Republic of Macedonia on the north, both regarded as rabies-endemic territories[7]. The Ministry of Rural Development and Food intensified surveillance and vaccination for stray cats and dogs, and started an oral vaccination programme for foxes in 2012. In 2010 and 2011, several EU countries received financial assistance by the European Community to further support eradication programmes[5,8]. Although human rabies is a very rare disease in the EU and most European countries are considered rabies-free, Romania, Croatia and Poland are not; also, the reintroduction of the rabies virus among animals in Italy (2008) and in Greece (2012), countries that had been rabies-free for more than 20 years, highlights the importance of continuous monitoring of the epidemiological situation, especially in animal reservoirs[6].

Travel-associated rabies

According to the World Health Organization, approximately 36 per cent of the world's rabies deaths occur in India each year, mostly in children who are bitten by infected dogs. Shortages in rabies immunoglobulin still represent the main constraint for human death prevention. India has frequently been the source of travel-associated cases of rabies. After a British woman died after being bitten by a dog in India, WHO issued a travel warning in June 2012 and recommended that travellers should be immunised before visiting the country, as the rabies risk was considered 'high' in India.

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Surveillance systems overview

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						Laboratories	Physicians	Hospitals	Others				
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Belgium	BE-REFLAB	V	Co	P	C	-	-	-	-	Y	-	-	Not specified/unknown
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	Y	-	-	EU-2008
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y	-	-	EU-2008
Denmark	DK-MIS	Cp	Co	P	C	N	Y	N	N	Y	-	-	Other
Estonia	EE-RABIES	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Finland	FI-NIDR	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
France	FR-MANDATORY_INFECTIOUS_DISEASES	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	Not specified/unknown
Germany	DE-SURVNET@RKI-7.1/6	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	Other
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Hungary	HU-Zoonoses	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Ireland	IE-CIDR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Italy	IT-NRS	Cp	Co	P	C	N	Y	Y	N	Y	-	-	Other
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU case definition (legacy/deprecated)
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Netherlands	NL-OSIRIS	Cp	Co	P	C	Y	Y	N	Y	Y	-	-	EU-2008
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	Not specified/unknown
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Portugal	PT-RABIES	Cp	Co	P	C	N	Y	N	N	Y	-	-	Other
Romania	RO-RNSSy	Cp	Co	P	C	N	N	Y	N	Y	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	Y	Y	-	-	EU-2008
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Spain	ES-STATUTORY_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
United Kingdom	UK-RABIES	O	Co	A	C	Y	N	Y	Y	Y	Y	-	EU case definition (legacy/deprecated)

Rubella

- In 2011, 8 411 cases were reported but only 817 (10%) were confirmed.
- The proportion of laboratory-confirmed cases has been decreasing and is too low to help with rubella elimination.
- Two countries, Poland and Romania, experienced large rubella outbreaks in 2011.
- Suboptimal coverage with the measles-mumps-rubella vaccine can lead to pockets of susceptible individuals and an increased number of cases, including congenital rubella infection.

Epidemiological situation in 2011

In 2011, 8 411 cases of rubella were reported from 25 EU/EEA countries. Only 817 cases (10%) were reported as confirmed in accordance with the EU case definition (Table 2.5.9). Liechtenstein did not report data. Belgium, Denmark, France and Germany do not have a specific surveillance system for rubella. In Belgium, a network of sentinel laboratories reports on a voluntary basis to the Institute of Public Health. France and Denmark have long-established systems for the surveillance of congenital rubella infection. A nationwide surveillance system for rubella and congenital rubella is currently being implemented in Germany, but no data were reported for 2011.

Table 2.5.9. Number and rate of reported confirmed rubella cases in EU/EEA countries, 2007–2011

Country	2011					2010		2009		2008		2007	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Crude rate	Cases	Crude rate	Cases	Crude rate	Cases	Crude rate	Cases	Crude rate
Austria	Y	C	2	2	0.02	2	0.02	308	3.69	12	0.14	14	0.17
Belgium	-	-	-	-	-	-	-	-	-	-	-	-	-
Bulgaria	Y	C	41	1	0.56	39	0.52	44	0.58	58	0.76	88	1.15
Cyprus	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Czech Republic	Y	C	28	15	0.27	4	0.04	6	0.06	14	0.14	4	0.04
Denmark	-	-	-	-	-	-	-	-	-	-	-	-	-
Estonia	Y	C	0	0	0.00	0	0.00	1	0.08	4	0.30	10	0.75
Finland	Y	C	3	3	0.06	0	0.00	0	0.00	0	0.00	0	0.00
France	-	-	-	-	-	-	-	-	-	-	-	-	-
Germany	-	-	-	-	-	-	-	-	-	-	-	-	-
Greece	Y	C	0	0	0.00	0	0.00	4	0.04	0	0.00	0	0.00
Hungary	Y	C	3	3	0.03	0	0.00	0	0.00	0	0.00	0	0.00
Ireland	Y	C	4	0	0.09	24	0.54	20	0.45	39	0.89	19	0.44
Italy	Y	C	104	104	0.17	109	0.18	221	0.37	6 183	10.37	758	1.28
Latvia	Y	C	2	1	0.10	0	0.00	7	0.31	9	0.40	7	0.31
Lithuania	Y	C	0	0	0.00	2	0.06	0	0.00	0	0.00	13	0.38
Luxembourg	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Malta	Y	C	0	0	0.00	0	0.00	0	0.00	3	0.73	2	0.49
Netherlands	Y	A+C	1	0	0.01	0	0.00	7	0.04	2	0.01	4	0.02
Poland	Y	A	4 290	7	11.14	4 197	11.00	7 587	19.90	13 146	34.49	22 891	60.05
Portugal	Y	C	0	0	0.00	1	0.01	3	0.03	4	0.04	6	0.06
Romania	Y	C	3 910	660	18.26	350	1.63	605	2.81	1 746	8.11	2 958	13.72
Slovakia	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	2	0.04
Slovenia	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	1	0.05
Spain	Y	C	10	8	0.02	9	0.02	20	0.04	46	0.10	14	0.03
Sweden	Y	C	5	5	0.05	3	0.03	1	0.01	0	0.00	2	0.02
United Kingdom	Y	C	6	6	0.01	12	0.02	10	0.02	36	0.06	34	0.06
EU total	**-**	**-**	**8 409**	**815**	**2.49**	**4 752**	**1.41**	**8 844**	**2.63**	**21 302**	**6.37**	**26 827**	**8.07**
Iceland	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	2	2	0.04	0	0.00	0	0.00	1	0.02	0	0.00
Total	**-**	**-**	**8 411**	**817**	**2.45**	**4 752**	**1.39**	**8 844**	**2.59**	**21 303**	**6.27**	**26 827**	**7.95**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

The number of reported rubella cases increased significantly in 2011, in comparison with the two previous years. Poland and Romania[1] experienced large outbreaks; together they contribute 97% of the reported cases in Europe (4290 and 3910 cases, respectively). The notification rate was 11.2 cases per 100000 population in Poland and 18.2 cases per 100000 in Romania.

Europe aims to wipe out measles and rubella by 2015, and the World Health Organization's Regional Office for Europe has set the elimination target for rubella at less than one case per one million population[2].

Age and gender distribution

Cases of rubella were more frequently reported in males than in females (overall notification rates of 2.85 and 2.05 per 100000). The highest reported rates were seen in those aged 0–4 years (8.95 per 100000), 5–14 years (8.06 per 100000) and 15–24 years (8.5 per 100000) (Figure 2.5.20). It should be noted that the overwhelming number of cases were reported by Poland and Romania; both countries reported large outbreaks.

The analysis of rates by age and gender does not include data from Poland. The most commonly affected age group was the age group 15–24 years of age, both in males and females, with reported rates of 9.9 and 6.4 cases per 100000 population, respectively (Figure 2.5.21).

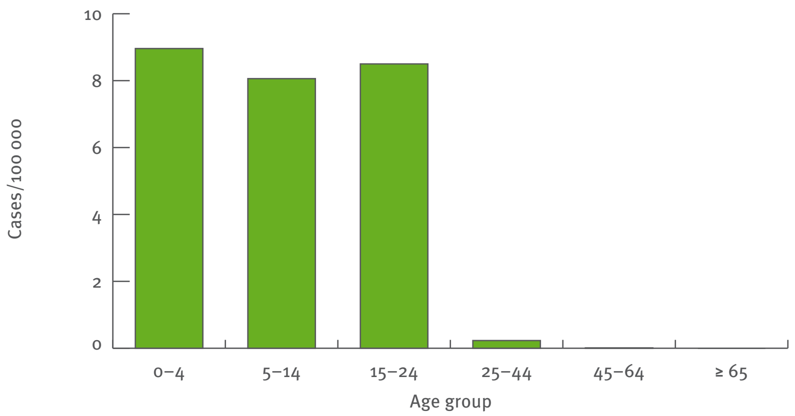
Seasonality

In 2011, the initial peak in the number of cases was seen in late winter and early spring (number of cases ranging from 617 to 705 between March and May), with a decrease over summer and autumn, followed by a sudden increase in cases starting in late autumn (1815 cases in November and 2098 cases in December). The pattern in late winter and early spring is similar to the one observed in previous years. The increase seen in late autumn is similar to the pattern seen in previous years during large epidemics (Figures 2.5.22 and 2.5.23).

Importation of rubella cases

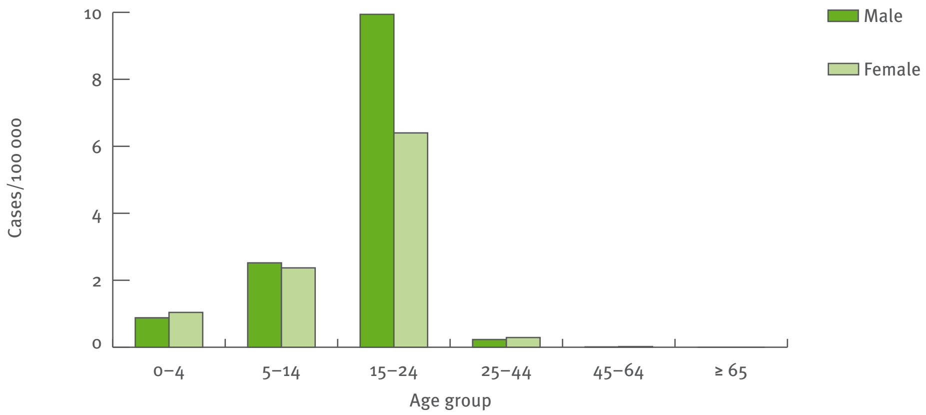
Information on importation status was available for 4010 cases (48% of total reported cases). Of those, only 13 cases were reported as imported.

Figure 2.5.20. Notification rates of rubella cases in the EU/EEA, 2011 (n=8411)



Source: Country reports from Austria, Bulgaria, Cyprus, the Czech Republic, Estonia, Finland, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Figure 2.5.21. Rates of confirmed rubella cases reported in the EU/EEA, by age and gender, 2011



Source: Country reports from Austria, Cyprus, the Czech Republic, Estonia, Finland, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Discussion

The main aim of rubella vaccination is the prevention of congenital rubella infection[3]. Initially, many countries only vaccinated adolescent girls, thereby leaving cohorts of males unvaccinated. After introduction of the measles-mumps-rubella vaccine, most countries began vaccinating all children, with additional catch-up campaigns for susceptible adolescents (two-dose schedule). In order to keep herd immunity, a sufficiently high vaccination coverage in all age groups is essential. With regard to the elimination framework, catch-up campaigns for susceptible groups are important, for example for young men.

Only 10% of the total number of cases are laboratory confirmed – too low in the context of the current rubella elimination strategy. Strengthening laboratory capacity in order to ensure investigation of clinical rubella cases is a key element to reach the goal of rubella elimination by 2015. Moreover, a strong effort should be made to strengthen rubella surveillance in all Member States.

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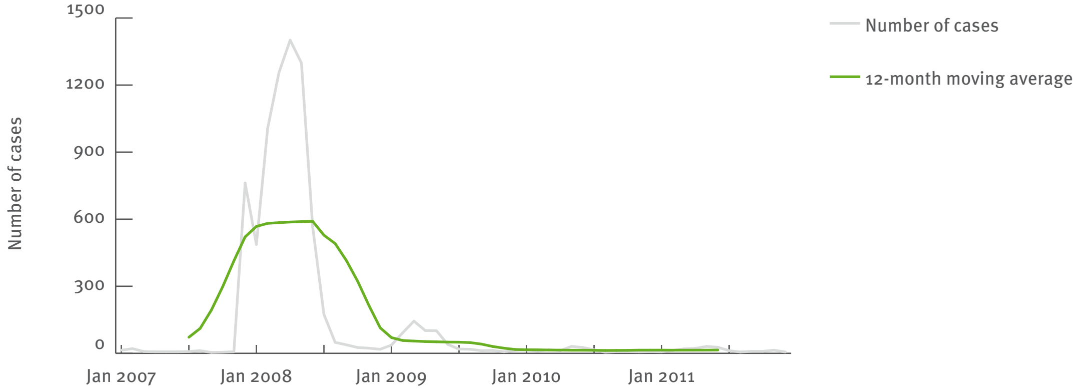
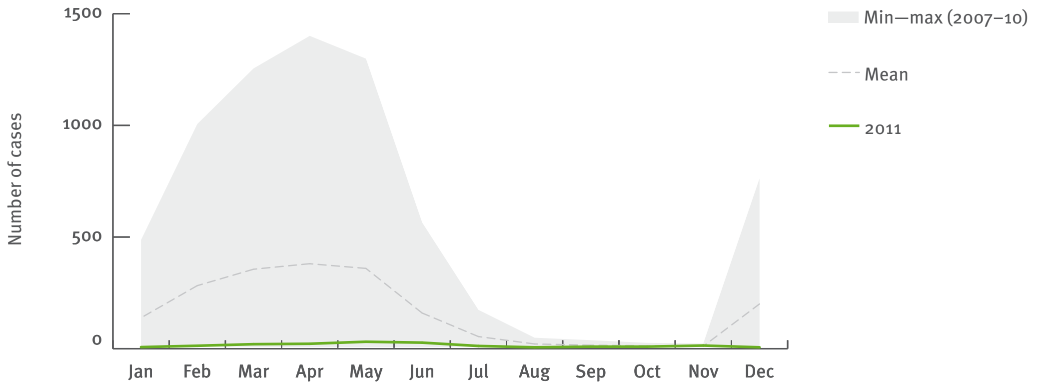
Figure 2.5.22. Trend and number of monthly confirmed cases of rubella reported in the EU/EEA, 2007–2011



Source: Country reports from Austria, Cyprus, the Czech Republic, Estonia, Finland, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Figure 2.5.23. Seasonal distribution: Number of cases of rubella by month, EU/EEA, 2007–2011



Source: Country reports from Austria, Bulgaria, Cyprus, the Czech Republic, Estonia, Finland, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by				National coverage	National reference laboratory data	Comparable data available	Case definition used
						Laboratories	Physicians	Hospitals	Others				
Austria	AT-Epidemiegesetz	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y	-	-	EU-2008
Estonia	EE-RUBELLA	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Finland	FI-NIDR	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Hungary	HU-EFRIR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Ireland	IE-CIDR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Italy	IT-NRS	Cp	Co	P	C	N	Y	Y	N	Y	-	-	Other
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU case definition (legacy/deprecated)
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	-	Y	N	N	-	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Netherlands	NL-Historical_EUVACNET	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Netherlands	NL-OSIRIS	Cp	Co	P	C	Y	Y	N	Y	Y	-	-	EU-2008
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	Not specified/unknown
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	N	Y	Y	N	Y	-	-	EU-2008
Portugal	PT-RUBELLA	Cp	Co	P	C	N	Y	N	N	-	-	-	Other
Romania	RO-Historical_EUVACNET	-	-	-	-	-	-	-	-	-	-	-	Not specified/unknown
Romania	RO-RNSSy	Cp	Co	P	A	N	N	Y	N	Y	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y	-	-	EU-2008
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Spain	ES-STATUTORY_DISEASES	Cp	Co	P	C	N	Y	Y	N	Y	-	-	EU-2008
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
United Kingdom	UK-RUBELLA	O	Co	P	C	Y	N	Y	Y	Y	-	-	Other

Tetanus

- Thanks to good general hygiene and effective universal vaccination, tetanus appears to be a rare disease in all EU/EEA countries.
- The overall case rate remains low (0.04 cases per 100 000 population). The highest rate was reported by Estonia (0.15 per 100 000).
- The most affected group was elderly women (65 years or older). Additional efforts should be made to improve the immunisation status of the adult and elderly population.

Tetanus is a sporadic and relatively uncommon infection in EU/EEA countries, caused by the bacterium *Clostridium tetani*. Contamination of wounds with tetanus spores in unimmunised persons can cause an illness with muscular spasms and sometimes death. Tetanus is included in the primary vaccination schedule of all EU/EEA countries, and periodic boosters in adulthood are required to maintain immunity.

Epidemiological situation in 2011

In 2011, 148 cases, including 93 confirmed cases (in accordance with the EU case definition), were reported by 27 EU/EEA countries (Table 2.5.10). Finland, Germany and Liechtenstein did not report. Italy, Romania, Poland, Greece, Spain and France accounted for most of the reported cases. The overall confirmed case rate remains low: 0.04 cases per 100 000 population. The highest rate was reported by Estonia (0.15 per 100 000). Italian

Table 2.5.10. Numbers and rates of tetanus cases reported in the EU/EEA, 2007–2011

Country	2011					2010		2009		2008		2007	
	National coverage	Report type	Total cases	Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population		Confirmed cases and notification rate per 100 000 population	
				Cases	Crude rate	Cases	Crude rate	Cases	Crude rate	Cases	Crude rate	Cases	Crude rate
Austria	Y	C	0	0	0.00	-	-	-	-	0	0.00	-	-
Belgium	Y	C	0	0	0.00	0	0.00	0	0.00	1	0.01	1	0.01
Bulgaria	Y	A	4	4	0.05	2	0.03	0	0.00	2	0.03	0	0.00
Cyprus	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Czech Republic	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Denmark	Y	C	0	0	0.00	0	0.00	0	0.00	2	0.04	3	0.06
Estonia	Y	C	2	2	0.15	0	0.00	0	0.00	0	0.00	0	0.00
Finland	-	-	-	-	-	-	-	-	-	-	-	-	-
France	Y	C	9	0	0.01	15	0.02	9	0.01	3	0.01	7	0.01
Germany	-	-	-	-	-	-	-	-	-	-	-	-	-
Greece	Y	C	11	1	0.10	5	0.04	2	0.02	7	0.06	10	0.09
Hungary	Y	C	4	0	0.04	0	0.00	6	0.06	4	0.04	4	0.04
Ireland	Y	C	0	0	0.00	0	0.00	0	0.00	2	0.05	1	0.02
Italy	Y	C	57	57	0.09	57	0.09	58	0.10	53	0.09	59	0.10
Latvia	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	1	0.04
Lithuania	Y	C	2	0	0.07	2	0.06	0	0.00	1	0.03	1	0.03
Luxembourg	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Malta	Y	C	0	0	0.00	3	0.72	0	0.00	0	0.00	0	0.00
Netherlands	Y	C	6	0	0.04	1	0.01	1	0.01	0	0.00	0	0.00
Poland	Y	C	14	0	0.04	16	0.04	19	0.05	14	0.04	19	0.05
Portugal	Y	C	0	0	0.00	3	0.03	6	0.06	1	0.01	9	0.09
Romania	Y	C	20	18	0.09	9	0.04	9	0.04	11	0.05	12	0.06
Slovakia	Y	C	1	0	0.02	0	0.00	0	0.00	0	0.00	1	0.02
Slovenia	Y	C	2	2	0.10	0	0.00	0	0.00	1	0.05	1	0.05
Spain	Y	C	10	9	0.02	8	0.02	7	0.02	10	0.02	8	0.02
Sweden	Y	C	3	0	0.03	0	0.00	3	0.03	0	0.00	0	0.00
United Kingdom	Y	C	3	0	0.01	9	0.02	8	0.01	4	0.01	5	0.01
EU total	**-**	**-**	**148**	**93**	**0.04**	**130**	**0.03**	**128**	**0.03**	**116**	**0.03**	**142**	**0.04**
Iceland	Y	C	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	Y	C	0	0	0.00	0	0.00	1	0.02	2	0.04	2	0.04
Total	**-**	**-**	**148**	**93**	**0.04**	**130**	**0.03**	**129**	**0.03**	**118**	**0.03**	**144**	**0.04**

Y: yes; N: no; A: aggregated data report; C: case-based report; U: unspecified; –: no report.

cases account for 57 of the 93 confirmed European cases in 2011. Italy has been reporting the highest number of cases since 2006, with a range from 53 to 64 cases annually.

Age and gender distribution

The most affected group was the elderly (≥ 65 years), representing 113 (73%) of the 148 reported cases for which age information was available (0.16 cases per 100 000), followed by the age group 45–64 years with 17 cases (11.5%) (Figure 2.5.24). Two cases were reported in the age group 0–4 years, two cases in the age group 5–24 years, six cases in the age group 25–44 yeas, and seven cases in the age group 45–64 years. The male-to-female ratio was 0.6:1. Seventy-three of the 89 female cases were in the age group 65 years and above. Vaccination status of the cases was not known.

Seasonality

Despite the low number of cases, a peak of tetanus-confirmed cases was recorded between June and October (Figure 2.5.25). This is probably related to more outdoor activities in summer and early autumn.

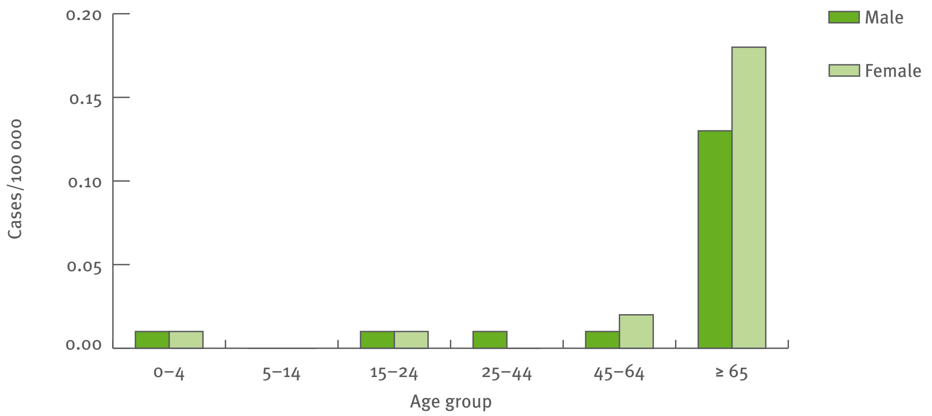
Discussion

The confirmed case rates for tetanus in the EU remain very low, thanks to the widespread use of tetanus vaccination in EU/EEA countries. The number of reported cases did not decrease significantly during the last years. The cases reported in the elderly were probably related to lower coverage or waning immunity in this population. The high proportion of women could be explained by different vaccination strategies during their youth, particularly in relation to vaccination on enrolment to military service for men[1]. This emphasises the need to maintain high vaccination rates in all age groups and to implement catch-up/booster strategies in countries with higher rates of disease.

References

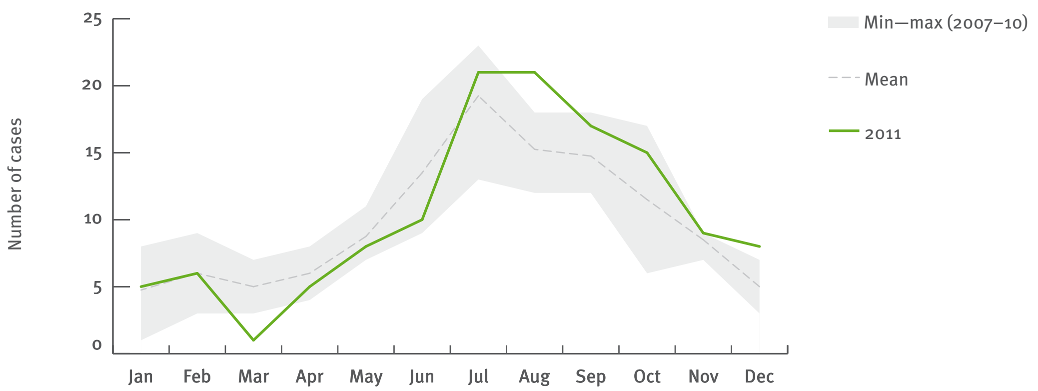
1. Wassilak SGF, Roper MH, Kretsinger K, Orenstein WA. Tetanus toxoid. In: Plotkin SA, Orenstein WA, Offit PA, editors. Vaccines. 5th edition. Philadelphia: Saunders Elsevier; 2008. p. 805-39.

Figure 2.5.24. Rates of confirmed tetanus cases reported in the EU/EEA, by age and gender, 2011



Source: Country reports from Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, France, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Figure 2.5.25. Seasonal distribution: Number of confirmed tetanus cases by month, EU/EEA, 2007–2011



Source: Country reports from Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, France, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Surveillance systems overview

Country	Data source	Compulsory (Cp)/ voluntary (V)/other (O)	Comprehensive (Co)/ sentinel (Se)/other (O)	Active (A)/passive (P)	Case-based (C)/ aggregated (A)	Data reported by				National coverage	National reference laboratory data	Comparable data available	Case definition used
						Laboratories	Physicians	Hospitals	Others				
Austria	AT-Reflab	V	O	P	C	Y	N	N	N	Y	-	-	EU-2008
Belgium	BE-FLA_FRA	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	Not specified/unknown
Bulgaria	BG-NATIONAL_SURVEILLANCE	Cp	Co	P	A	Y	Y	Y	Y	Y	-	-	EU-2008
Cyprus	CY-NOTIFIED_DISEASES	Cp	Co	P	C	N	Y	N	N	Y	-	-	EU-2008
Czech Republic	CZ-EPIDAT	Cp	Co	A	C	N	Y	Y	N	Y	-	-	EU-2008
Denmark	DK-MIS	Cp	Co	P	C	N	Y	N	N	Y	-	-	Other
Estonia	EE-TETANUS	Cp	Co	P	C	N	Y	Y	Y	Y	-	-	EU-2008
France	FR-MANDATORY_INFECTIOUS_DISEASES	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	Not specified/unknown
Greece	GR-NOTIFIABLE_DISEASES	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Hungary	HU-EFRIR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Iceland	IS-SUBJECT_TO_REGISTRATION	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Ireland	IE-CIDR	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Italy	IT-NRS	Cp	Co	P	C	N	Y	Y	N	Y	-	-	Other
Latvia	LV-BSN	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU case definition (legacy/deprecated)
Lithuania	LT-COMMUNICABLE_DISEASES	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Luxembourg	LU-SYSTEM1	Cp	Co	P	C	Y	Y	N	N	Y	-	-	Not specified/unknown
Malta	MT-DISEASE_SURVEILLANCE	Cp	Co	P	C	Y	Y	Y	Y	Y	-	-	EU-2008
Netherlands	NL-OSIRIS	Cp	Co	P	C	Y	Y	N	Y	Y	-	-	EU-2008
Norway	NO-MSIS_A	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	Not specified/unknown
Poland	PL-NATIONAL_SURVEILLANCE	Cp	Co	P	C	N	Y	Y	N	Y	-	-	EU-2008
Portugal	PT-TETANUS	Cp	Co	P	C	N	Y	N	N	Y	-	-	Other
Romania	RO-RNSSy	Cp	Co	P	C	N	N	Y	N	Y	-	-	EU-2008
Slovakia	SK-EPIS	Cp	Co	A	C	Y	Y	Y	N	Y	-	-	EU-2008
Slovenia	SI-SURVIVAL	Cp	Co	P	C	Y	Y	Y	N	Y	-	-	EU-2008
Spain	ES-STATUTORY_DISEASES	Cp	Co	P	C	N	Y	Y	N	Y	-	-	EU-2008
Sweden	SE-SMINET	Cp	Co	P	C	Y	Y	N	N	Y	-	-	EU-2008
United Kingdom	UK-TETANUS	O	Co	P	C	Y	N	Y	Y	Y	-	-	Other

2.6 Antimicrobial-resistant pathogens and healthcare-associated infections

Antimicrobial resistance

- Antimicrobial resistance (AMR) is a serious threat to public health. The percentages of AMR, especially multidrug resistance, continued to increase in Europe, leading to mounting healthcare costs, failed treatments, and deaths.
- Data from the European Antimicrobial Resistance Surveillance Network (EARS-Net) show large variations in the occurrence of AMR in Europe depending on microorganism, antimicrobial agent and geographical region.
- In 2011, the occurrence of meticillin-resistant *Staphylococcus aureus* (MRSA) was stabilising, or even decreasing, in several European countries. However, the percentage of MRSA among all *Staphylococcus aureus* isolates remained above 25% in eight of the 28 EU/EEA reporting countries.
- Over the last four years, there has been a significantly increasing trend of multidrug resistance (combined resistance to multiple antibiotics) in both *Escherichia coli* and *Klebsiella pneumoniae* in more than one third of the reporting EU/EEA countries. Options for treatments of patients who are infected with such multidrug-resistant bacteria are limited to only few last-line antibiotics, such as carbapenems. However, carbapenem resistance is increasing and is already high in some countries, which further limits options for the treatment of infected patients.
- Continued efforts to promote prudent use of antimicrobial agents and comprehensive infection prevention and control measures are paramount to reduce the selection and control transmission of antimicrobial-resistant bacteria.

Data sources

The data presented in this section were collected by the European Antimicrobial Resistance Surveillance Network (EARS-Net). Data collection was coordinated by ECDC. EARS-Net collects data on invasive bacterial isolates from more than 900 public health laboratories. These laboratories serve over 1400 hospitals in Europe. For more details on EARS-Net, detailed surveillance results and information on analysis methods, please refer to the EARS-Net Annual Report 2011[1] and the EARS-Net interactive database[2].

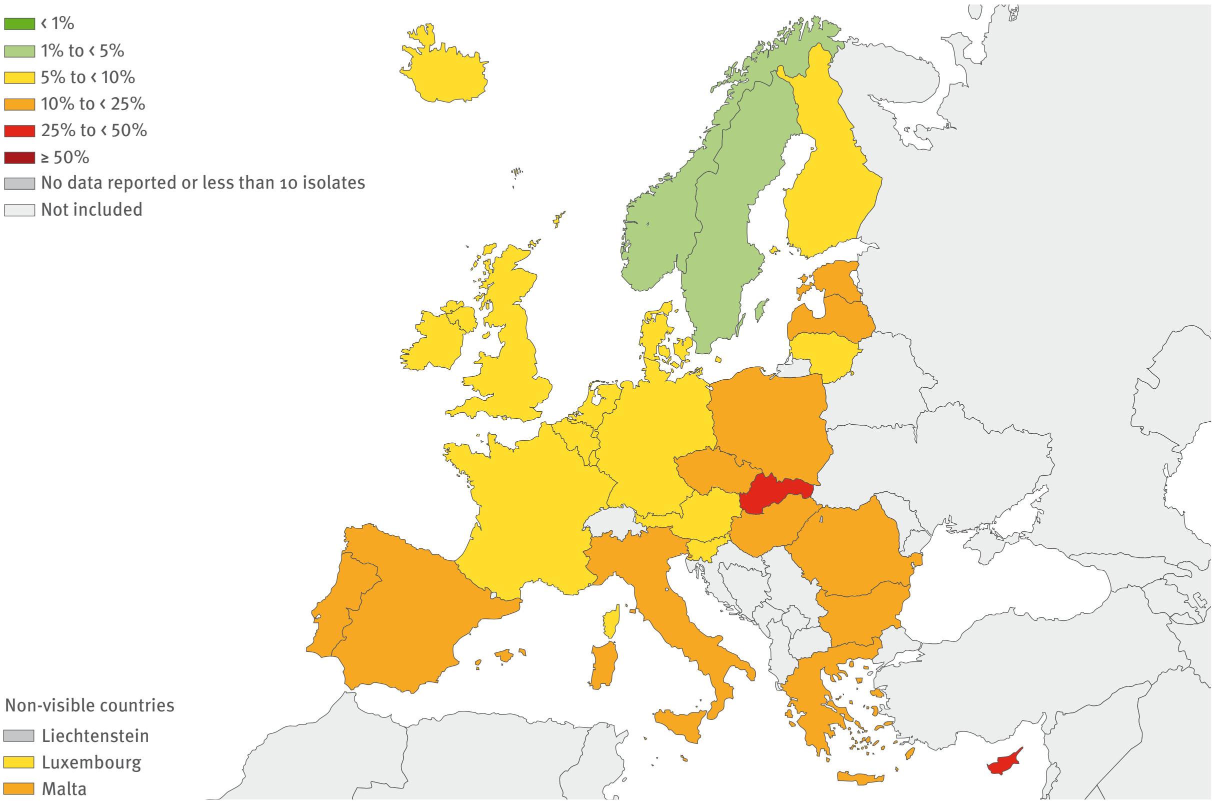
Escherichia coli

Escherichia coli is among the most frequently isolated Gram-negative bacteria in blood cultures and a major cause of urinary tract infection, both in the community and in healthcare settings. Antimicrobial resistance in *E. coli* requires close attention as the percentages of isolates resistant to commonly used antimicrobials continue to increase throughout Europe.

In 2011, the percentage of *E. coli* isolates resistant to third-generation cephalosporins ranged from 3% (Sweden) to 36% (Cyprus) and showed a clear north-to-south gradient, with the highest percentages of resistance reported from southern Europe and lower percentages reported by countries in northern Europe (Figure 2.6.1). Between 2008 and 2011, the percentages of *E. coli* isolates resistant to third-generation cephalosporins significantly increased in 18 of 28 reporting countries. No country showed a decreasing trend during this period. A majority of the isolates that were resistant to third-generation cephalosporins were ascertained as being extended-spectrum beta-lactamase (ESBL)-positive, ranging between 71% and 100%, depending on the reporting country.

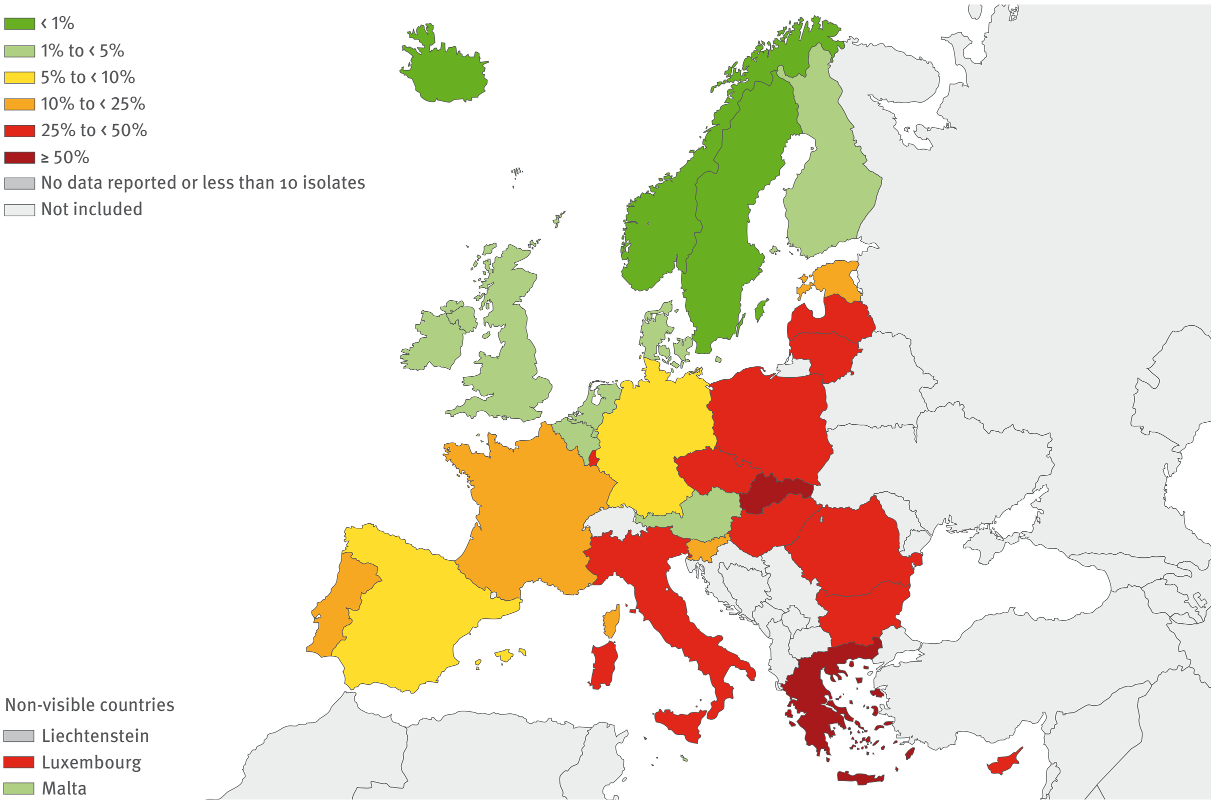
During the same period, the percentage of multidrug-resistant isolates (showing combined resistance to third-generation cephalosporins, fluoroquinolones and aminoglycosides) significantly increased in 13 of the 28 reporting countries. Only two countries (Malta and Bulgaria) reported decreasing trends. In 2011, the percentage of multidrug-resistant isolates ranged from less than 1% (Iceland) to 18% (Cyprus), and showed a similar

Figure 2.6.1. ***Escherichia coli*****: percentage (%) of invasive (blood and cerebrospinal fluid) isolates resistant to third-generation cephalosporins, EU/EEA, 2011**



Source: EARS-Net. Only data from countries reporting more than 10 isolates are shown.

Figure 2.6.2. ***Klebsiella pneumoniae*****: percentage (%) of invasive (blood and cerebrospinal fluid) isolates with multidrug resistance (resistant to third-generation cephalosporins, fluoroquinolones and aminoglycosides), EU/EEA, 2011**



Source: EARS-Net. Only data from countries reporting more than 10 isolates are shown.

north-to-south gradient as for third-generation cephalosporin resistance.

Klebsiella pneumoniae

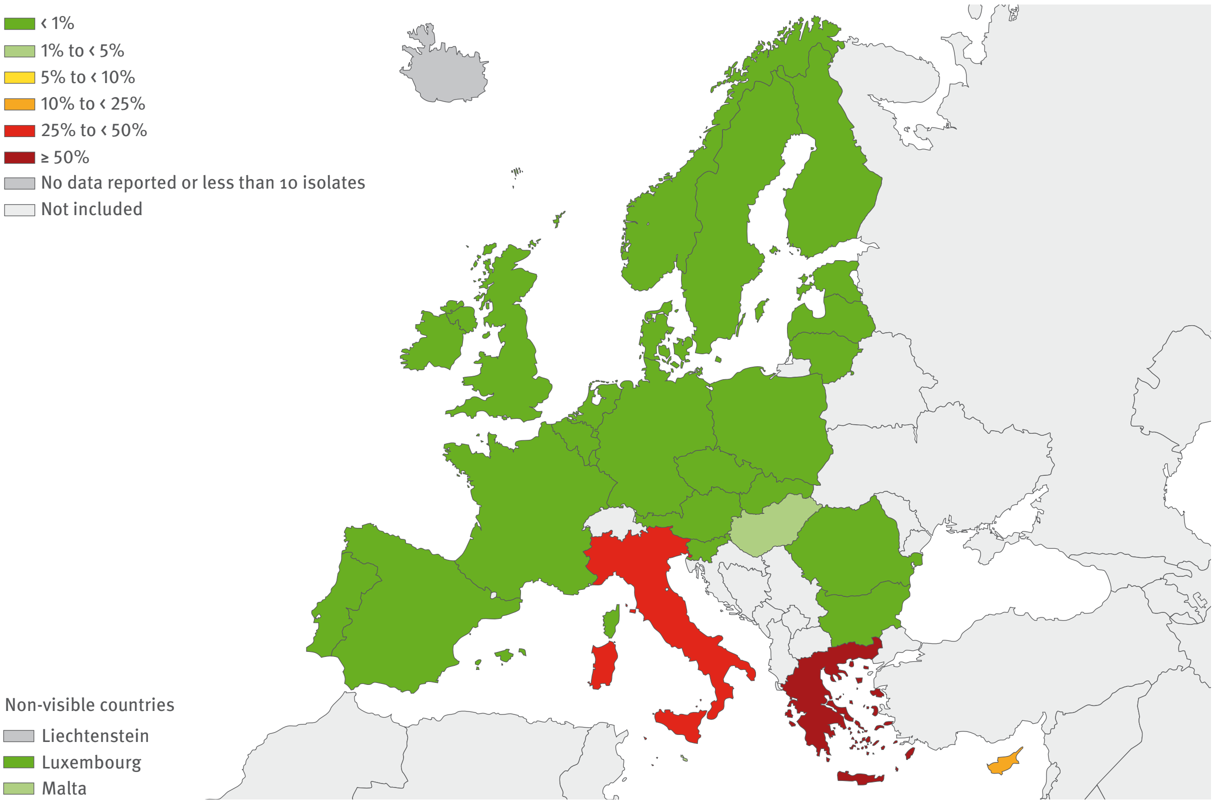
Klebsiella pneumoniae is an important cause of infection in persons with impaired immune system and patients with indwelling devices. Urinary tract infections, respiratory tract infections and bloodstream infections are frequently encountered. The increasing percentage of antimicrobial-resistant *K. pneumoniae* is a public health concern of growing importance in Europe and worldwide.

In 2011, the percentage of *K. pneumoniae* isolates resistant to third-generation cephalosporins continued to increase in Europe, ranging between 2% (Sweden) and 81% (Bulgaria). Trend analyses for the period 2008 to 2011 showed significantly increasing trends for 10 of 25 reporting countries, while none of the countries showed a decreasing trend. The percentages of third-generation cephalosporin-resistant isolates reported as ESBL-positive ranged between 65% and 100%.

Multidrug resistance was common. In 2011, the percentage of *K. pneumoniae* isolates that were multidrug-resistant (combined resistance to third-generation cephalosporins, fluoroquinolones and aminoglycosides) was above 10% in more than half of all reporting countries, and over one third of the countries reported multidrug resistance percentages higher than 25% (Figure 2.6.2). High percentages of multidrug-resistant *K. pneumoniae* were reported, in particular, by countries in southern, central and eastern Europe. Significantly increasing trends of multidrug resistance were reported from 10 countries, while only one country (United Kingdom) reported a decreasing trend.

In 2011, the percentage of carbapenem-resistant invasive *K. pneumoniae* isolates ranged between zero (13 countries) to 68% (Figure 2.6.3), with 15 countries reporting one or more resistant isolates in 2011. A detailed analysis of data from EARS-Net showed that the number of countries with ≥1% carbapenem resistance amongst invasive *K. pneumoniae* isolates increased from two in 2005 (Greece, 27.8%; Germany, 3.1%) to five in 2010 (Greece, 49.8%; Cyprus, 16.4%; Italy, 12.5%; Hungary, 5.9%; Portugal, 2.2%). Significant increasing trends were observed for Greece, Cyprus, Hungary and Italy ($p < 0.01$). Germany, which did not report any carbapenem-resistant *K. pneumoniae* isolate in 2010, showed a decreasing trend ($p < 0.01$)[3]. The increasing percentage of carbapenem resistance is of particular concern as carbapenems are among the few effective antimicrobials available for the treatment of infections caused by multidrug-resistant *K. pneumoniae*.

Figure 2.6.3. *Klebsiella pneumoniae*: percentage (%) of invasive (blood and cerebrospinal fluid) isolates resistant to carbapenems, EU/EEA, 2011



Source: EARS-Net. Only data from countries reporting more than 10 isolates are shown.

Pseudomonas aeruginosa

Pseudomonas aeruginosa is an important cause of infection among patients with impaired immune system.

In 2011, high percentages of *P. aeruginosa* isolates resistant to aminoglycosides, ceftazidime, fluoroquinolones, piperacillin/tazobactam and carbapenems were reported from several countries, especially in southern and eastern Europe. Resistance to carbapenems was above 10% in 19 of 29 reporting countries (Figure 2.6.4). Multidrug resistance was also common, with 15% of the isolates reported as resistant to at least three antimicrobial classes.

Despite the high percentages of resistance in invasive *P. aeruginosa* isolates, trend analyses for the period 2008 to 2011 showed a generally stable situation in Europe, with few countries reporting significantly increasing or decreasing trends of resistance to various antimicrobial agents.

Streptococcus pneumoniae

Streptococcus pneumoniae is a common cause of infection, especially in young children, elderly people and patients with impaired immune systems. The clinical spectrum of *S. pneumoniae* infections ranges from upper respiratory tract infections such as sinusitis and otitis media to bloodstream infections and meningitis. *Streptococcus pneumoniae* is also one of the major causes of pneumonia worldwide and is associated with high morbidity and mortality.

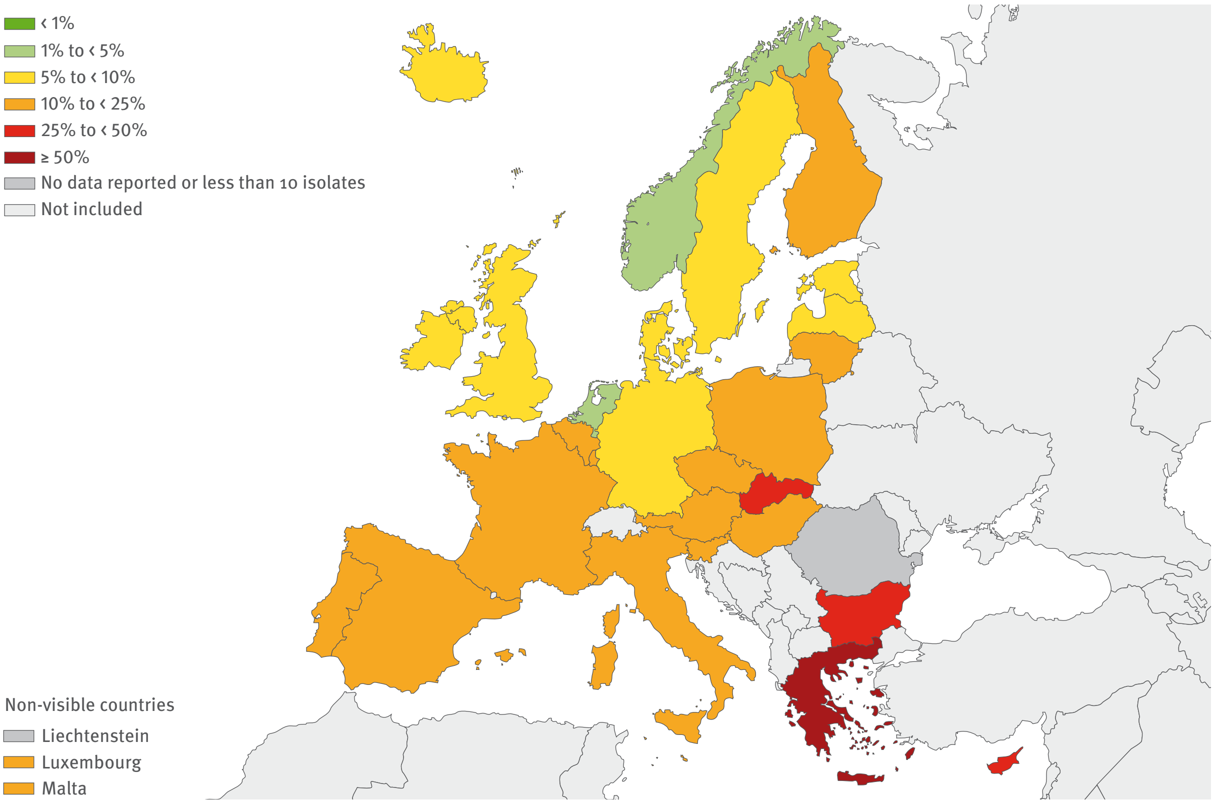
The percentage of *S. pneumoniae* isolates non-susceptible to penicillin was above 10% in 13 of 27 reporting countries, while combined non-susceptibility to both penicillin and macrolides was above 10% in nine of 27 countries. Trend analyses for the period 2008 to 2011 showed that four countries (Denmark, Lithuania, Spain and Sweden) reported a significantly increasing trend for combined non-susceptibility to penicillin and macrolides, while five countries (Belgium, France, Germany, Hungary, and Portugal) had decreasing trends.

Staphylococcus aureus

Staphylococcus aureus in its oxacillin-resistant form (meticillin-resistant *S. aureus*, MRSA) is one of the most important causes of antimicrobial-resistant healthcare-associated infections worldwide. During the past decade, several European countries implemented national action plans targeted at reducing the spread of MRSA in healthcare facilities.

The percentage of *S. aureus* isolates reported as MRSA is now stabilising or decreasing in most European countries. Six countries reported a significantly decreasing trend over the last four years (Belgium, France, Germany, Ireland, Spain and the United Kingdom), while only four countries reported an increasing trend (Hungary, Luxembourg, Poland and Romania). Although

Figure 2.6.4. *Pseudomonas aeruginosa*: percentage (%) of invasive (blood and cerebrospinal fluid) isolates resistant to carbapenems, EU/EEA, 2011



Source: EARS-Net. Only data from countries reporting more than 10 isolates are shown.

these observations provide reasons for optimism, MRSA remains a public health priority because the percentage of MRSA is still above 25% in eight of 28 reporting countries, mainly in southern and eastern Europe (Figure 2.6.5).

Enterococcus faecalis and *Enterococcus faecium*

Enterococci belong to the normal bacterial flora of the gastrointestinal tract of humans, but may also cause a variety of clinical infections including endocarditis, bacteraemia, meningitis, wound and urinary tract infections, and are associated with peritonitis and intra-abdominal abscesses.

High-level aminoglycoside resistance in *E. faecalis* occurs frequently, with a majority of the countries reporting percentages of resistant isolates between 25% and 50%. A significant decrease over the last four-year period was observed for Belgium, Cyprus, Greece, Portugal, and the United Kingdom. A significantly increasing trend was only observed for Austria and Luxembourg.

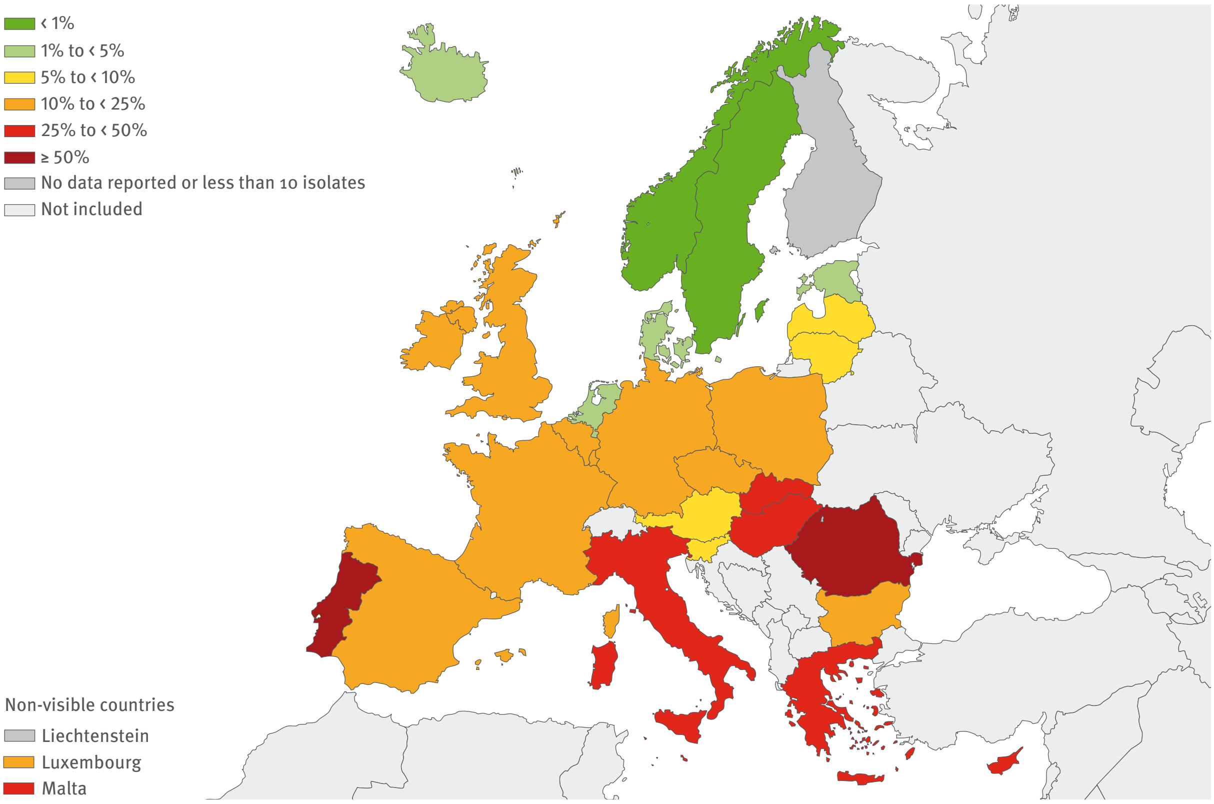
The occurrence of vancomycin resistance in *E. faecium* continued to decrease in Europe. Four countries reported significantly decreasing trends over the last four years (Greece, Slovenia, Sweden, and the United Kingdom), while Germany reported an increasing trend. Only one country (Ireland) reported percentages of vancomycin-resistant isolates above 25%, while most of the countries reported percentages of vancomycin-resistant isolates below 5%.

Discussion

The occurrence of antimicrobial resistance in Europe varies depending on the microorganism, the antimicrobial agent and the geographical region. For several antimicrobial agent and microorganism combinations, a north-to-south gradient is evident, with generally lower resistance percentages reported from northern Europe compared with southern Europe. These geographical differences may reflect differences in antimicrobial use and infection control practices in the reporting countries.

Trends in the occurrence of resistance for some antimicrobial-resistant bacteria (e.g. MRSA) indicate that national efforts to improve infection prevention and control in healthcare may halt or even reverse the development and spread of antimicrobial resistance. Unfortunately, the increasing occurrence of multidrug-resistant *K. pneumoniae* and *E. coli* underline that antimicrobial resistance remains a threat to patient safety and public health in Europe. Options for treatment of patients who are infected with multidrug-resistant bacteria are limited to a few remaining last-line antimicrobials, such as the carbapenems. The increase of carbapenem-resistant *K. pneumoniae* observed in Europe in recent years, further limits the number of available treatment options. The problem of antimicrobial resistance calls for international cooperation, as well as concerted efforts at the

Figure 2.6.5. *Staphylococcus aureus*: percentage (%) of invasive (blood and cerebrospinal fluid) isolates resistant to meticillin (MRSA), EU/EEA, 2011



Source: EARS-Net. Only data from countries reporting more than 10 isolates are shown.

national level. Continued efforts to promote prudent use of antimicrobial agents and comprehensive infection prevention and control measures are paramount to reduce the selection and control transmission of antimicrobial-resistant bacteria.

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Antimicrobial consumption

- The European Surveillance of Antimicrobial Consumption Network (ESAC-Net) collects data on antimicrobial consumption in the community and in the hospital sector from 29 EU/EEA countries. In 2011, all participating countries reported data for the community, and 18 countries reported data for the hospital sector.
- In 2011, consumption of antibacterials ('antibiotics') for systemic use (ATC group J01) in the community displayed a large variation and ranged from 11.4 to 35.1 Defined Daily Doses (DDD) per 1 000 inhabitants and per day, depending on the country (median 19.5 DDD per 1 000 inhabitants and per day).
- In 2011, consumption of antibacterials for systemic use (ATC group J01) in the hospital sector ranged from 1.0 to 3.1 DDD per 1 000 inhabitants and per day, depending on the country.
- Comparable and reliable data on antimicrobial consumption is a prerequisite for the development of indicators for monitoring progress towards a more prudent use of antimicrobials.
- Reporting of antimicrobial consumption from hospitals should be improved by increasing the number of participating countries that report data for the hospital sector by collecting data at the hospital level and by using additional denominators for hospital consumption. This would help to identify areas for improvement, which should then be addressed by national, regional and local antimicrobial stewardship programmes; also, hospital antimicrobial consumption data from ESAC-Net should be linked with antimicrobial resistance data from the European Antimicrobial Resistance Surveillance Network (EARS-Net).

The European Surveillance of Antimicrobial Consumption Network (ESAC-Net) is a Europe-wide network of national surveillance systems, collecting European reference data on antimicrobial consumption. ESAC-Net collects and analyses data on antimicrobial consumption from 29 EU/EEA countries, both in the community and in the hospital sector[1]. Data for the period prior to 2010 were collected by the ESAC project[2].

The data sources for ESAC-Net are national sales or reimbursement data, depending on the country, and include information from national drug registers. The WHO Anatomical Therapeutic Chemical (ATC) classification system is used for the allocation of antimicrobials into groups[3]. Data on antimicrobial consumption are collected at the product level for antibacterials ('antibiotics') for systemic use (ATC group J01), antimycotics for systemic use (ATC group J02), antimycobacterials (ATC group J04) and antivirals for systemic use (ATC group J05). In addition, data on a few other antimicrobials (outside of ATC group J) are also collected. Antimicrobial consumption is expressed as a number of WHO Defined Daily Doses (DDD) per 1 000 inhabitants and per day.

Epidemiological situation in 2011

Twenty-nine countries reported data for 2011. All countries reported data on antimicrobial consumption in the community. Four countries (Cyprus, Iceland, Lithuania and Slovakia) were only able to report data on total consumption in the country.

Eighteen countries reported specific data on antimicrobial consumption for the hospital sector.

For both the community and the hospital sector, these data were mainly on sales of antimicrobials in the country, or a combination of sales and reimbursement data.

Consumption of antibacterials ('antibiotics') for systemic use in the community

Consumption of antibacterials ('antibiotics') for systemic use in the community (i.e. outside hospitals) ranged from 11.4 DDD per 1 000 inhabitants and per day in the Netherlands to 35.1 DDD per 1 000 inhabitants and per day in Greece (Figure 2.6.6). The median consumption was 19.5 DDD per 1 000 inhabitants and per day.

As in previous years, penicillins were the most frequently prescribed antibacterials in all countries, ranging from 27.7% (Germany) to 67.0% (Slovenia) whereas the proportion of consumption of other antibacterial classes varied widely among the countries, e.g. cephalosporins and other beta-lactams, where the range was from 0.3% (Denmark) to 24.2% (Malta); macrolides, lincosamides and streptogramins had a range from 4.3% (Sweden) to 26.7% (Greece); and quinolones ranged from 3.3% (Denmark) to 14.3% (Romania) (Figure 2.6.6).

In 19 (66%) of the 29 EU/EEA countries, more than half of the consumption in the community corresponded to three or fewer antibacterial agents (total: 11 antibacterial agents). The two most often consumed antibacterials for systemic use, i.e. amoxicillin with and without enzyme inhibitor and phenoxymethylpenicillin, were from the penicillin group.

Temporal trends in the consumption of antibacterials for systemic use from 2007 to 2011 are presented in Figure 2.6.7. The median consumption of antibacterials ranged from 18.4 (2007) to 19.5 (2011) DDD per 1 000 inhabitants and per day for the 29 EU/EEA countries that reported data for these years. Using linear regression, a significant increase in consumption during the period from 2007 to 2011 was observed for Belgium, Malta and the United Kingdom, while consumption did not significantly decrease in any country during the same period.

Consumption of antibacterials ('antibiotics') for systemic use in the hospital sector

Consumption of antibacterials ('antibiotics') for systemic use in the hospital sector ranged from 1.0 DDD per 1000 inhabitants and per day in the Netherlands to 3.1 DDD per 1000 inhabitants and per day in Romania (Figure 2.6.8). The position of Finland is explained by the fact that Finnish data for the hospital sector also include antimicrobial consumption in remote primary healthcare centres and nursing homes.

The relative proportion of consumption of various antibacterial classes in the hospital sector varied widely among the countries (Figure 2.6.8). In contrast to prescription practices in the community, penicillins were not the most frequently prescribed antibiotic class in all countries. In the hospital sector, substantial variations were reported: the consumption of cephalosporins and other beta-lactams, including carbapenems, ranged from 8.9% in Ireland to 54.2 % in Bulgaria; the consumption of macrolides, lincosamides and streptogramins varied from 0.5% in Luxembourg to 12.5% in Sweden; and quinolones had a range from 6.0% in Portugal to 18.4% in Italy.

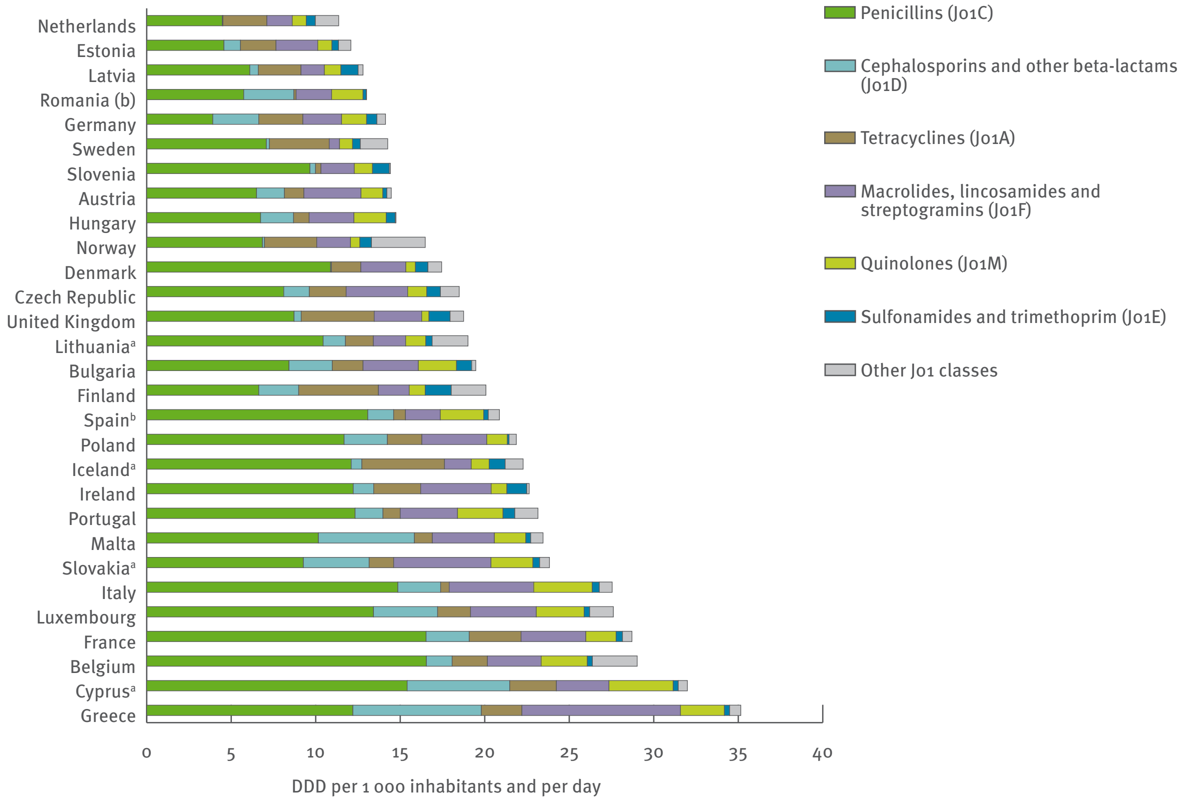
Discussion

Irresponsible use and overuse of antimicrobials is associated with the development and spread of antimicrobial resistance, which has become a serious threat to public health, notably because of the emergence and spread of highly-resistant bacteria and because there are very few novel antimicrobial agents in the research and development pipeline[4]. Antimicrobial consumption, and in particular the consumption of antibacterials for systemic use expressed in DDD per 1000 inhabitants and per day, is a potential indicator[5] for healthcare professionals and policy makers to monitor progress towards a more prudent use of antibiotics.

Intercountry comparisons should be made with caution. Certain countries report on total consumption, i.e. both the community and the hospital sector, rather than consumption in the community, and this may vary from year to year, even in the same country. In addition, there are differences in the sources of national data and in the availability of a national registry of all antimicrobials available on the domestic market, the latter being a prerequisite for proper calculations of antimicrobial consumption.

The largest proportion of antimicrobial consumption in humans takes place in the community (i.e. outside of hospitals), and in two-thirds of the participating countries only three or fewer antimicrobial agents account for half of the total national consumption in the community.

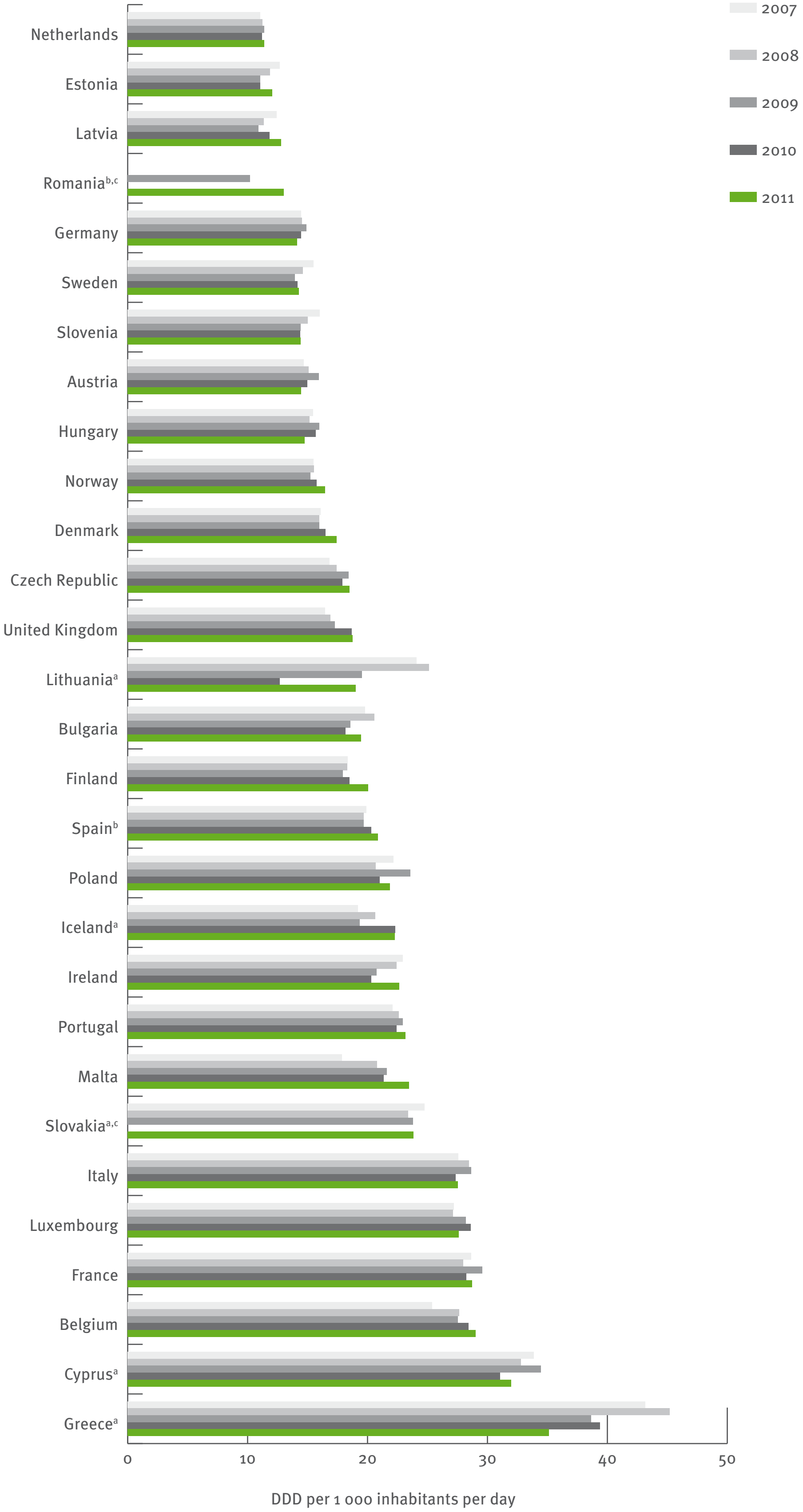
Figure 2.6.6. Distribution of consumption of antibacterials for systemic use (ATC group J01) in the community (outside of hospitals) at ATC group level 3, EU/EEA, 2011, expressed as DDD per 1000 inhabitants and per day



(a) Cyprus, Iceland, Lithuania and Slovakia provided total care data, i.e. including the hospital sector. On average, 90% of total care data correspond to consumption in the community.

(b) Romania and Spain provided reimbursement data, i.e. not including consumption of antibiotics obtained without a prescription and other non-reimbursed courses.

Figure 2.6.7. Trends of consumption of antibacterials for systemic use (ATC group J01) in the community (outside of hospitals), EU/EEA, 2007 (top bar) to 2011 (bottom bar), expressed as DDD per 1 000 inhabitants and per day



(a) Cyprus (2007–2011), Greece (2007, 2008, and 2010), Iceland (2010, 2011), Lithuania (2007–2009, 2011) and Slovakia (2011) only provided total care data, i.e. including the hospital sector. On average, 90% of total care data correspond to consumption in the community.

(b) Romania and Spain reported reimbursement data, i.e. not including over-the-counter sales without a prescription and other non-reimbursed courses.

(c) Romania (2007, 2008, and 2010) and Slovakia (2010) did not report data for these years.

Currently, the most worrying trends of antimicrobial resistance are being observed in hospitals with infections due to bacteria such as *Klebsiella pneumoniae* that have become multidrug-resistant, including resistance to last-line antimicrobials such as carbapenems. The reasons are varying infection prevention and control practices as well as irresponsible and overuse of antimicrobial agents. Reliable data on antimicrobial consumption from European hospitals are paramount for our understanding of antimicrobial resistance epidemiology in Europe. Surveillance of hospital antimicrobial consumption must therefore be improved and this represents the next challenge for this type of surveillance in EU/EEA countries. This should be done by increasing the number of participating countries that report data for the hospital sector, by collecting consumption data at the hospital level, and by using additional denominators for hospital consumption. Such developments should help to identify areas for improvement, which could then be addressed by national, regional and local antimicrobial stewardship programmes. Also, hospital antimicrobial consumption data from ESAC-Net should be linked with antimicrobial resistance data from the European Antimicrobial Resistance Surveillance Network (EARS-Net).

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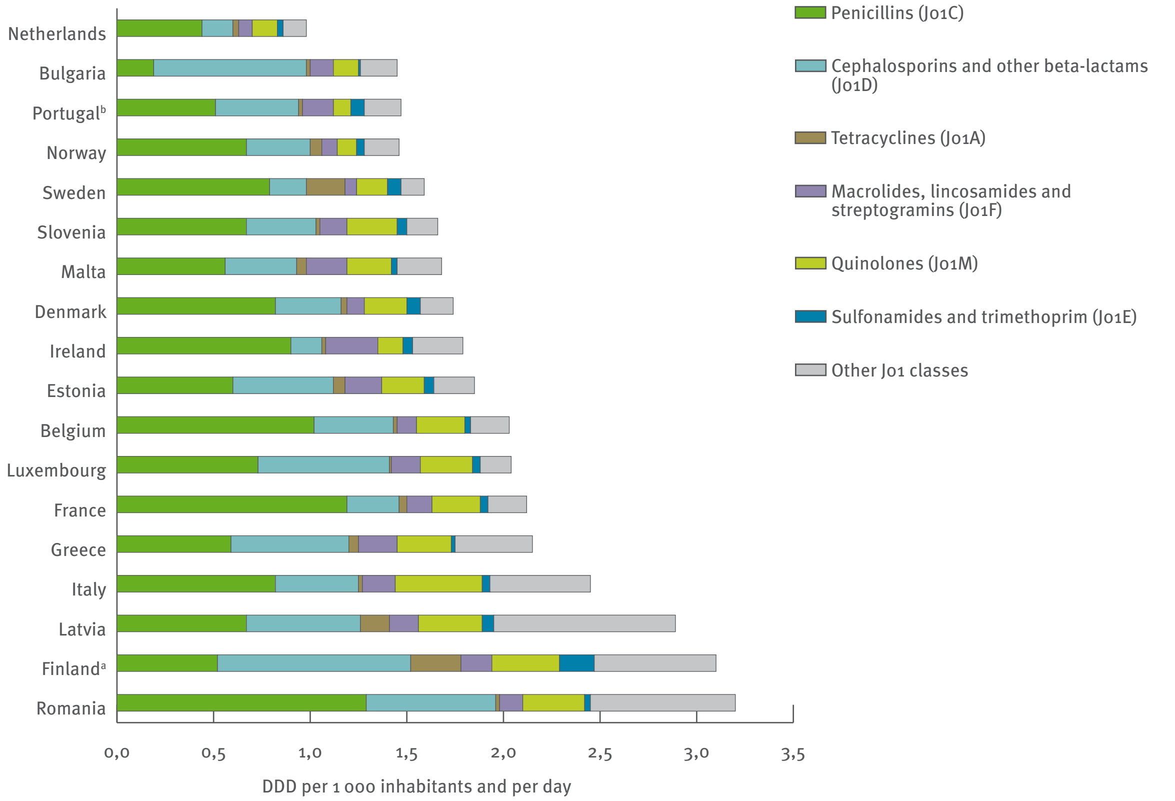
Figure 2.6.8. Distribution of consumption of antibacterials for systemic use (ATC group J01) at ATC group level 3 in the hospital sector, EU/EEA, 2011, expressed as DDD per 1 000 inhabitants and per day



(a) Finland: data include consumption in remote primary healthcare centres and nursing homes

(b) Portugal: data only correspond to public hospitals

Healthcare-associated infections

In 2011–2012, 29 EU/EEA Member States and Croatia participated in the first EU-wide, ECDC-coordinated point prevalence survey of healthcare-associated infections (HAIs) and antimicrobial use in European acute care hospitals. This ECDC survey confirmed that HAIs are a major public health problem in Europe, with a prevalence of 5.7% (95% confidence interval CI): 4.5–7.4%) or 81 089 (95% CI: 64 624–105 895) patients with at least one HAI on any given day in European acute care hospitals in 2011–2012. The total annual number of patients with at least one HAI in European acute care hospitals was estimated at 3.2 million, with a large confidence interval ranging from 1.9 million to 5.2 million patients. The prevalence of antimicrobial use was estimated at 32.7% (95% CI: 29.4–36.2%), with 466 226 (95% CI: 419 284–515 690) patients receiving at least one antimicrobial on any given day in European acute care hospitals in 2011–2012.

In 2011, 16 countries participated in the surveillance of surgical site infections (SSIs) according to the ECDC HAI-Net SSI protocol. Three countries submitted data on SSIs for the first time in 2011. A total of 424 871 surgical operations were included and a total of 8 371 surgical site infections were reported. Approximately half of all SSIs were reported after patient discharge from hospital. The cumulative incidence of SSIs varied from 0.7% after knee prosthesis to 9.2% after colon surgery.

Fourteen countries participated in the surveillance of HAIs in intensive care units (ICUs). One country submitted data for the first time in 2011. Pneumonia episodes were reported in 5.6% of patients who spent more than two days in ICUs; urinary tract infection episodes were reported in 2.9%, and bloodstream infections in 3.0%.

Point prevalence survey of healthcare-associated infections (HAIs) and antimicrobial use in European acute care hospitals, 2011–2012

Introduction

In 2011–2012, 29 EU/EEA countries and Croatia participated in the first EU-wide, ECDC-coordinated point prevalence survey (PPS) of healthcare-associated infections (HAIs) and antimicrobial use in European acute care hospitals. An estimated 2 800 healthcare workers from 1 200 hospitals across Europe were trained by national PPS coordinating staff to implement the standardised PPS methodology[1]. The detailed results of this PPS were published in July 2013[2]. This chapter presents a summary of these results.

ECDC received data for a total of 273 753 patients in 1 149 hospitals. Of these, 231 459 patients from 947 hospitals

Table 2.6.1. Antimicrobial resistance markers in microorganisms reported in healthcare-associated infections, EU/EEA (ECDC PPS), 2011–2012

	N of isolates	N tested	N NS	% NS
Gram-positive cocci				
Staphylococcus aureus (MRSA)	1 196	1 071	441	41.2
Enterococci, VAN-R (VRE)	929	755	77	10.2
Enterococcus faecalis, VAN-R	538	455	25	5.5
Enterococcus faecium, VAN-R	235	205	39	19.0
Enterobacteriaceae, 3GC-NS	3 419	2 851	953	33.4
Escherichia coli, 3GC-NS	1 535	1 292	304	23.5
Klebsiella spp., 3GC-NS	842	726	385	53.0
Klebsiella pneumoniae, 3GC-NS	665	594	337	56.7
Klebsiella oxytoca, 3GC-NS	110	87	24	24.4
Enterobacter spp., 3GC-NS	397	343	139	40.5
Enterobacteriaceae, CAR-NS	3 356	2 787	212	7.6
Escherichia coli, CAR-NS	1 510	1 267	46	3.6
Klebsiella spp., CAR-NS	842	719	139	19.3
Klebsiella pneumoniae, CAR-NS	665	589	133	22.6
Klebsiella oxytoca, CAR-NS	109	84	0	0
Enterobacter spp., CAR-NS	394	340	12	3.5
Other Gram-negative bacteria, CAR-NS				
Pseudomonas aeruginosa, CAR-NS	878	756	240	31.8
Acinetobacter baumannii, CAR-NS	316	292	237	81.2

N = number, N tested = N of isolates with known susceptibility results, R = resistant, NS = non-susceptible, N NS = N of NS isolates (only R isolates, for MRSA, VRE and VAN-R), MRSA = meticillin-resistant *Staphylococcus aureus*, VRE = vancomycin-resistant *Enterococcus* spp., VAN-R = vancomycin-resistant, 3GC-NS = third-generation cephalosporin-non-susceptible, CAR-NS = carbapenem-non-susceptible. Data from the following countries were excluded because of methodological divergence of the national protocol: The Netherlands, excluded for all bug-drug combinations, and Lithuania, excluded for all carbapenem results in *Enterobacteriaceae* (except for *K. pneumoniae*).

were included in the final European sample for analysis. Data from a single ward were collected in a single day. The average time frame for data collection on all patients in a single hospital was 12 days (median: 9 days).

Healthcare-associated infections

The prevalence of patients with at least one HAI in acute care hospitals in the PPS sample was 6.0% (country range: 2.3%–10.8%). When extrapolated to the average daily number of occupied beds per country, the HAI prevalence was estimated at 5.7% (95% CI: 4.5–7.4%). The number of patients with at least one HAI on any given day in European acute care hospitals was estimated at 81 089 (95%CI: 64 624–105 895). The annual number of patients with at least one HAI in European acute care hospitals was estimated at 3.2 million (95% CI: 1.9–5.2 million).

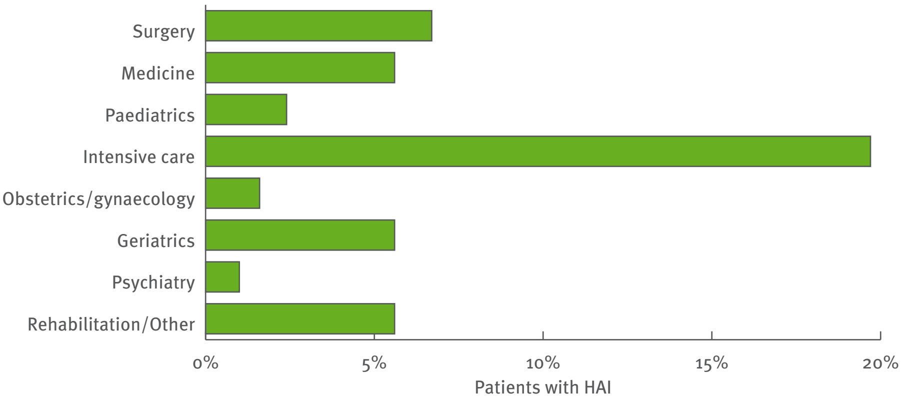
Of a total of 15 000 reported HAIs, the most frequently reported types of HAI were respiratory tract infections (pneumonia and lower respiratory tract, 19.4% and 4.1%, respectively), surgical site infections (19.6%), urinary tract infections (19.0%), bloodstream infections (10.7%) and gastro-intestinal infections (7.7%), with *Clostridium difficile* infections accounting for 48% of the latter. Twenty-three percent of HAIs (n=3 503) were present on admission. One third of HAIs on admission were surgical site infections. Healthcare-associated pneumonia episodes were associated with a medical device (intubation) in 33% of the cases and urinary tract infections were associated with a medical device (urinary catheter) in 59.5% of the cases. Bloodstream infections were reported as catheter-related in 39.5% of the cases, and secondary to another infection site in 28.8% of the cases. For 31.7% of the bloodstream infections, the origin was unknown.

HAI prevalence was the highest in patients admitted to intensive care units (ICUs), where 19.5% patients had at least one HAI, compared with 5.2% on average for all other specialties combined (Figure 2.6.9a). ICU patients accounted for 5.0% of the total hospital population, but for 16.5% of all patients with HAIs. The most frequent types of HAI in the ICU were respiratory tract infections (pneumonia and lower respiratory tract infections) and bloodstream infections. Urinary tract infection was the most frequent type of HAI type in geriatrics, psychiatry and rehabilitation/other specialties, while surgical site infections were the most frequent infection type in surgery and in gynaecology and obstetrics. In paediatric patients, systemic infections (clinical sepsis) represented a large proportion of HAIs (Figure 2.6.9b).

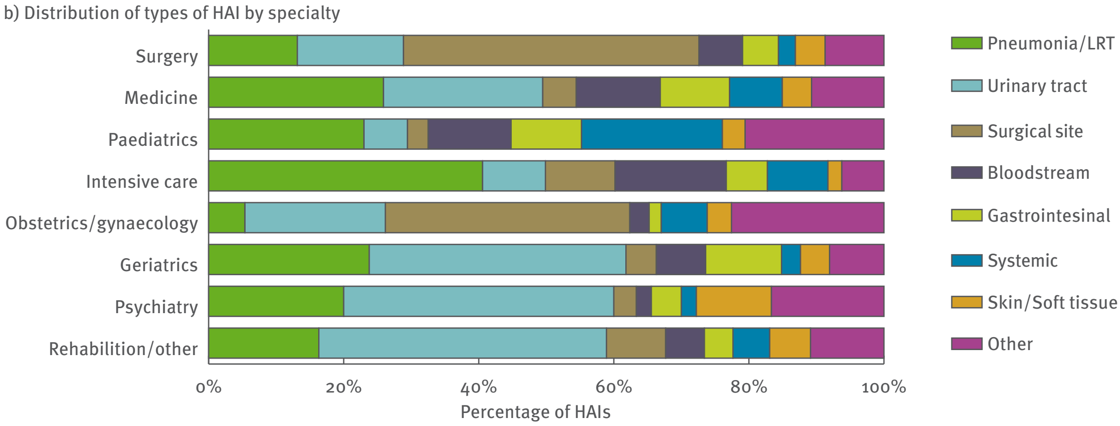
The prevalence of HAIs varied according to the hospital type, with considerable variability within each hospital type. Primary hospitals recorded a HAI prevalence of 4.8% (median: 3.9%, IQR: 1.9–6.1%), in secondary hospitals HAI prevalence was 5.0% (median: 4.5%, IQR: 2.7–6.8%), in tertiary hospitals 7.2% (median: 6.9%, IQR:

Figure 2.6.9. Prevalence of healthcare-associated infections (HAIs) and distribution of types of HAI by specialty, n=231 459 patients, EU/EEA (ECDC PPS), 2011-2012

a) Prevalence of HAIs (percentage patients with at least one HAI)



b) Distribution of types of HAI by specialty



4.0–9.7%), and in specialised hospitals 6.0% (median: 4.0%, IQR: 1.6–6.7%).

The microorganisms that were the most frequently isolated from HAIs were, in decreasing order, *Escherichia coli* (15.9%), *Staphylococcus aureus* (12.3%), *Enterococcus* spp. (9.6%), *Pseudomonas aeruginosa* (8.9%) *Klebsiella* spp. (8.7%), coagulase-negative staphylococci (7.5%), *Candida* spp. (6.1%), *Clostridium difficile* (5.4%), *Enterobacter* spp. (4.2%), *Proteus* spp. (3.8%) and *Acinetobacter* spp. (3.6%). Selected antimicrobial susceptibility testing (AST) data were available, on the day of the PPS, for 85.0% of microorganisms reported in HAIs. Meticillin resistance was reported in 41.2% of *S. aureus* isolates with known AST results. Vancomycin resistance was reported in 10.2% of isolated enterococci. Non-susceptibility (i.e. resistant or intermediate isolates) to third-generation cephalosporins was reported in 33.4% of all *Enterobacteriaceae* isolates and was the highest in *K. pneumoniae*. Carbapenem non-susceptibility was reported in 7.6% of all included *Enterobacteriaceae* and was also the highest in *K. pneumoniae*. Carbapenem non-susceptibility was reported in 31.8% of *P. aeruginosa* isolates and 81.2% of *Acinetobacter baumannii* isolates (Table 2.6.1).

Antimicrobial use

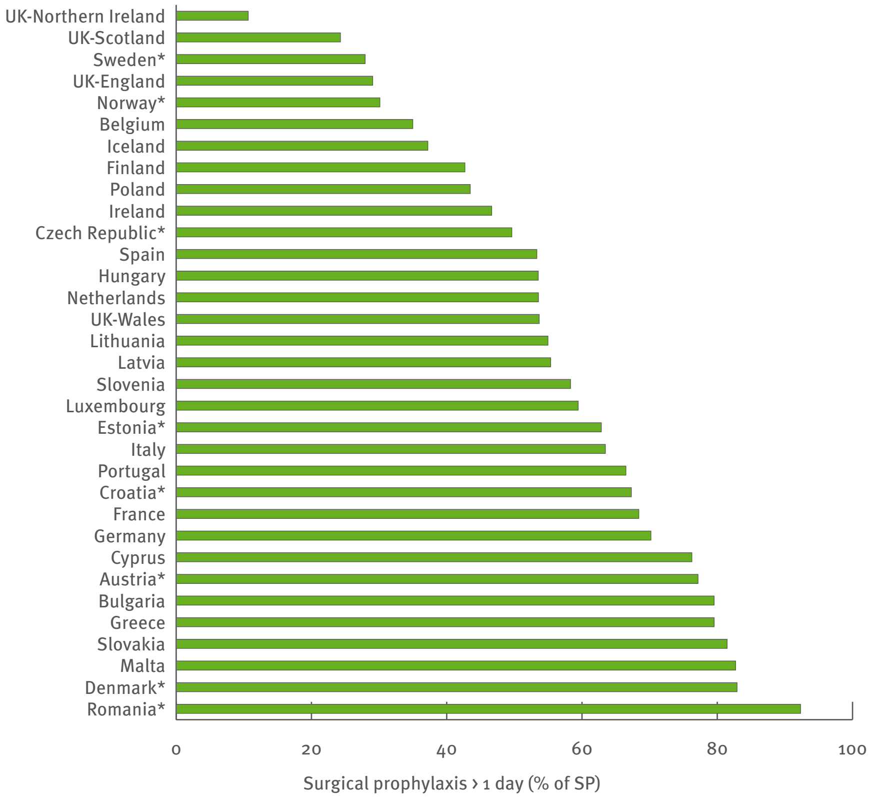
The prevalence of patients receiving at least one antimicrobial agent was 35.0% (country range: 21.4%–54.7%).

The overall prevalence of antimicrobial use extrapolated to the number of occupied beds in Europe was 32.7% (95% CI: 29.4–36.2%) and 466 226 (95% CI: 419 284–515 690) patients were estimated to receive at least one antimicrobial agent on any given day in European acute care hospitals in 2011–2012.

Antimicrobials were administered parenterally in 70.6% of the prescriptions, and the reason for antimicrobial use was documented in the patient's medical records in 79.4% of the prescriptions. Antimicrobials were most frequently prescribed for treatment of infections (68.4%): community-acquired infection (47.6%), hospital infection (19.1%), and infection acquired in a long-term care facility (1.8%). Surgical prophylaxis was the indication for 16.3% of the prescriptions, medical prophylaxis for 11.3% and other or unknown indications accounted for the remaining 4.0% of prescriptions. Surgical prophylaxis was prolonged for more than one day in 59.2% of the courses with this indication. This percentage varied widely, depending on the country: from 10.7% in UK-Northern Ireland to 92.3% in Romania (Figure 2.6.10).

Prevalence of antimicrobial use varied significantly according to the hospital type ($p<0.001$), with the highest levels observed in tertiary hospitals (median prevalence per hospital: 38.4%, IQR: 30.7–46.6%) and the lowest prevalence observed in primary hospitals (median:

Figure 2.6.10. Surgical prophylaxis given for more than one day as a percentage of the total antimicrobials prescribed for surgical prophylaxis, by country, EU/EEA (ECDC PPS), 2011–2012



SP = surgical prophylaxis

* PPS data representativeness was poor in Austria, Croatia, the Czech Republic, Estonia, Norway and Romania, and very poor in Denmark and Sweden.

31.8%, IQR: 25.0–41.7%). Prevalence of antimicrobial use also varied according to medical specialty and was the highest in intensive care units (ICUs) (56.5%) and the lowest in psychiatry (3.5%). The indications for antimicrobial use varied widely according to specialty, with the highest relative use for treatment of community infections in paediatrics (71.3% of all antimicrobials for this type of infection), the highest relative use for treatment of hospital infections in ICU patients (37.3%), and the highest relative use for treatment of long-term care-associated infections in rehabilitation units and geriatrics (6.1% and 5.1%, respectively).

Of 222 different reported antimicrobial agents, 21 (9.5%) antimicrobial agents accounted for 75% of the total antimicrobial use in European hospitals. The most frequently prescribed antimicrobial agent was amoxicillin with enzyme inhibitor (ATC code J01CR02), which represented 11.0% of the total of prescribed antimicrobial agents and was used in 79.2% of all hospitals. Ciprofloxacin accounted for 6.7% of the total and was used in 84.3% of all hospitals. The median number of different antimicrobial agents reported per hospital was 20 (IQR: 12–29).

Structure and process indicators

For the first time, this PPS also provided data on infection control structure and process indicators for hospitals in all EU/EEA countries, i.e. (a) consumption of alcohol-based hand rubs as a proxy indicator of hand hygiene, (b) percentage of single-room beds as a proxy indicator of isolation capacity of patients carrying microorganisms requiring enhanced infection prevention and control measures, and (c) full-time equivalent specialised infection prevention and control staff.

The median alcohol hand rub consumption was 18.7 L/1000 patient-days and varied from less than 10 L/1000 patient-days in Bulgaria, Hungary, Lithuania, Italy, Romania and Slovakia, to more than 50 L/1000 patient-days in Denmark, Greece, Norway, Malta and Sweden.

The country median percentage of single-room beds (as a percentage of the total number of hospital beds) was 11.1% (IQR: 5.2%–23.4%) and ranged from 1.7% in Hungary to 51.6% in France.

The median number of full-time equivalent (FTE) infection prevention and control nurses per 250 beds was 0.94 (IQR: 0.56–1.61), and ranged from 0 in Latvia, Lithuania, Romania and Slovakia to 1.95 FTE/250 beds in Ireland.

Conclusions

The results of this ECDC PPS provided the most comprehensive description of the epidemiology of HAIs in Europe to date. The survey confirmed that HAIs and antimicrobial resistance represent a major public health problem in Europe. The rising epidemic of carbapenem-resistant Gram-negative bacteria in several countries and the major importance of other well-known hospital bacteria such as MRSA and *Clostridium difficile* were confirmed by the ECDC PPS.

The ECDC PPS also confirmed that hospitalised patients are often exposed to antimicrobials. The ECDC PPS used the previous ESAC hospital PPS methodology, which allowed the identification of several antimicrobial practices which need to be improved, in particular the use of broad-spectrum antimicrobials, prolonged duration of surgical prophylaxis, high use of medical prophylaxis, and frequent parenteral administration for antibiotics. Occasionally, poor documentation in the patient's chart is one of the reasons why antimicrobials are prescribed.

Table 2.6.2. Number of reported operations by country and type of operation, EU/EEA, 2011

Country (data source)	Number of hospitals	Number of operations							
		CABG	CHOL	COLO	CSEC	HPRO	KPRO	LAM	Total
Austria	35	270	426	247	3217	4926	433	-	**9519**
Finland	10	-	-	-	-	6308	4921	-	**11229**
France	689	1272	14577	6857	19101	26178	14116	1869	**83970**
Germany	320	10692	12964	6934	15525	34497	17803	3507	**101922**
Hungary	32	86	1342	274	2480	884	118	183	**5367**
Italy	91	1082	4449	2785	4350	4670	2164	738	**20238**
Lithuania	21	655	1013	407	2165	812	452	-	**5504**
Malta	1	221	-	-	386	236	-	-	**843**
Netherlands	46	-	3682	2561	5208	8605	6071	661	**26788**
Norway	47	528	778	409	2223	2600	-	-	**6538**
Portugal	21	-	1480	1023	1860	832	667	54	**5916**
Slovakia	6	-	418	-	-	-	-	-	**418**
Spain	12	308	255	679	384	909	501	217	**3253**
United Kingdom[a]	275	5336	-	3553	21916	47432	49778	378	**128393**
Subtotal: patient-based data	**1606**	**20450**	**41384**	**25729**	**78815**	**138889**	**97024**	**7607**	**409898**
Czech Republic	1	-	-	318	-	-	-	-	**318**
Romania	4	-	442	1545	-	114	-	952	**3053**
United Kingdom[b]	24	-	-	-	6663	2938	2001	-	**11602**
Subtotal: unit-based data	**29**	**-**	**442**	**1863**	**6663**	**3052**	**2001**	**952**	**14973**
Total EU/EEA	**1635**	**20450**	**41826**	**27592**	**85478**	**141941**	**99025**	**8559**	**424871**

Source: HAI-Net SSI. CABG: coronary artery bypass graft; CHOL: cholecystectomy; COLO: colon surgery; CSEC: Caesarean section; HPRO: hip prosthesis; KPRO: knee prosthesis; LAM: laminectomy; –: no data. (a) UK comprises data from England, Northern Ireland, Scotland and Wales (b) Data from UK-Scotland only.

Despite limitations and inherent difficulties arising from the magnitude of such a European survey and the need for agreement on, and adherence to, uniform definitions, methodology and requirements, the ECDC PPS achieved the following objectives: the estimation of the burden of HAIs and of antimicrobial use in acute care hospitals in the EU/EEA; the description of HAIs and antimicrobial use by type of hospital, patients and by country; the improvement of HAI surveillance skills by training approximately 2800 healthcare workers across Europe; the dissemination of the results (e.g. through feedback of the results to the participating hospitals) and by providing a standardised tool for hospitals to identify targets for quality improvement.

Although a major step forward has been taken with this ECDC PPS, in particular by raising awareness about HAI and increasing HAI surveillance skills in healthcare workers, more training is needed to harmonise the interpretation of case definitions of HAIs across Europe. This, combined with additional validation efforts of PPS data should allow comparisons, after risk adjustments, of HAI prevalence between countries and between hospitals. In the meantime, direct comparisons of HAI prevalence between countries should not be made without taking into account the patient case mix, confidence intervals, and data validity. The ECDC report on this first ECDC PPS includes an attempt to provide country-specific, observed and predicted HAI. It also gives antimicrobial use prevalence rates and explains the underlying risk-adjustment methodology[1].

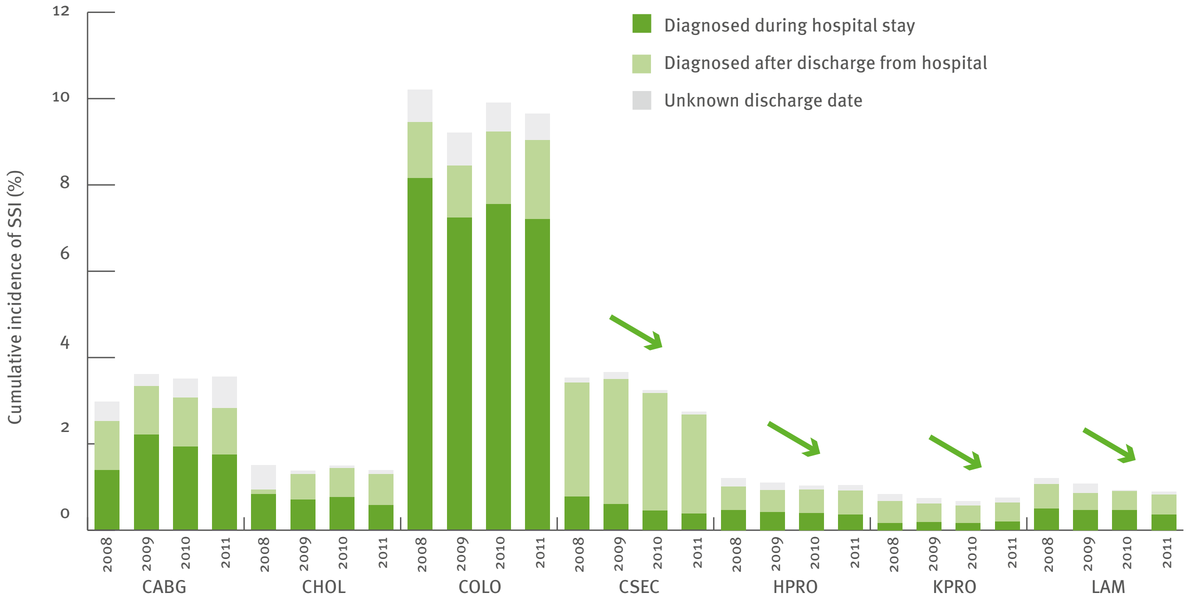
Targeted surveillance of surgical site infections and of infections acquired in intensive care units

Surveillance of surgical site infections

Surveillance data for surgical site infections (SSIs) in 2011 (with partial follow-up of patients who had undergone orthopaedic surgery until December 2012) were received from 20 surveillance networks in 16 countries and included 424871 surgical operations from 1635 hospitals (compared with 386597 surgical operations from 1557 hospitals in 2010). The types and numbers of surgical operations reported by each country are shown in Table 2.6.20. Three countries (Czech Republic, Romania and Slovakia) reported SSI data for the first time in 2011, and three networks reported SSI surveillance data for the first time according to the new, unit-based ('light') version of the protocol (Czech Republic, Romania and UK-Scotland). The unit-based protocol allows for the reporting of patient-based data for SSIs (numerator), but only records aggregated denominator data by type of surgery. Since a stratified analysis by risk factor was not possible for data obtained following the unit-based protocol, an analysis of these data was performed separately. The methodology for SSI surveillance is described in the HAI-Net SSI protocol[4].

The percentage of SSIs (cumulative incidence, which includes in-hospital and post-discharge diagnosed SSIs) varied according to the type of operation, with the highest

Figure 2.6.11. Cumulative incidence of surgical site infections by year and operation type, EU/EEA, 2008–2011



Data source: ECDC, HAI-Net SSI patient-based data 2008–2011

Countries (networks) participating a minimum of three years between 2008 and 2011 by type of operation: CABG: AT, DE, ES, FR, HU, IT (SNICh), LT, MT, NO, UK (England); CHOL: AT, DE, ES, FR, HU, IT (SNICh), LT, NL, NO, PT; COLO: AT, DE, ES, FR, HU, IT (SNICh), LT, NL, NO, PT, UK (England); CSEC: AT, DE, ES, FR, HU, IT (SNICh), LT, NL, NO, PT, UK (Northern Ireland, Scotland and Wales); HPRO: AT, DE, ES, FI, FR, HU, IT (SNICh), LT, NL,NO, PT, UK (England, Northern Ireland, Scotland and Wales); KPRO: AT, DE, ES, FI, FR, HU, IT (SNICh), LT, NL, PT, UK (England, Northern Ireland, Scotland and Wales); LAM: DE, ES, FR, HU, IT (SNICh), NL, PT. Arrows indicate a significant trend of cumulative incidence ($p<0.05$). The United Kingdom was excluded from the trend analysis of CABG, COLO, HPRO and KPRO because of a change in the surveillance protocol in UK-England in 2008 (see methods).

Note: Post-discharge surveillance methods and practices differ considerably among countries.

CABG: coronary artery bypass graft; CHOL: cholecystectomy; COLO: colon surgery; CSEC: Caesarean section; HPRO: hip prosthesis; KPRO: knee prosthesis; LAM: laminectomy. Since data of all countries were pooled, methodological variations between and within countries may account for a part of the observed trends.

rate (9.2%) reported in colon surgery and the lowest rate (0.7%) in knee prosthesis. The cumulative incidence of SSIs was 3.5% in coronary artery bypass grafts, 2.6% in Caesarean sections, 1.4% in cholecystectomies, 1.0% in hip prostheses, and 0.8% in laminectomies.

Trends for SSI rates were analysed for the last four years (2008–2011) and only in networks that participated for at least three years during this period. The trends were analysed for the cumulative incidence of SSIs, adjusting for case mix (risk index) by means of logistic regression and for the in-hospital incidence density of SSIs (only for SSIs diagnosed in hospital) by means of Poisson regression analysis. Data for UK-England in 2008 were excluded from the trend analysis of the cumulative incidence of SSIs because of changes in the surveillance protocol of post-discharge surveillance of SSIs that took place in mid-2008 in UK-England.

Significant overall, risk-adjusted decreasing trends for the cumulative incidence of SSIs during the period 2008–2011 were observed for SSIs after Caesarean section ($p<0.001$), hip prosthesis ($p<0.001$), knee prosthesis ($p<0.001$) and laminectomy ($p<0.05$) (Figure 2.6.11). Significant decreasing trends for incidence density of in-hospital diagnosed SSIs were observed in four types of operations: cholecystectomy ($p<0.001$), colon surgery ($p<0.01$), Caesarean section ($p<0.001$) and hip prosthesis ($p<0.001$), and an increasing trend was observed for knee prosthesis ($p<0.05$). No trend was observed in coronary artery bypass graft surgery during 2008–2011 (Figure 2.6.12).

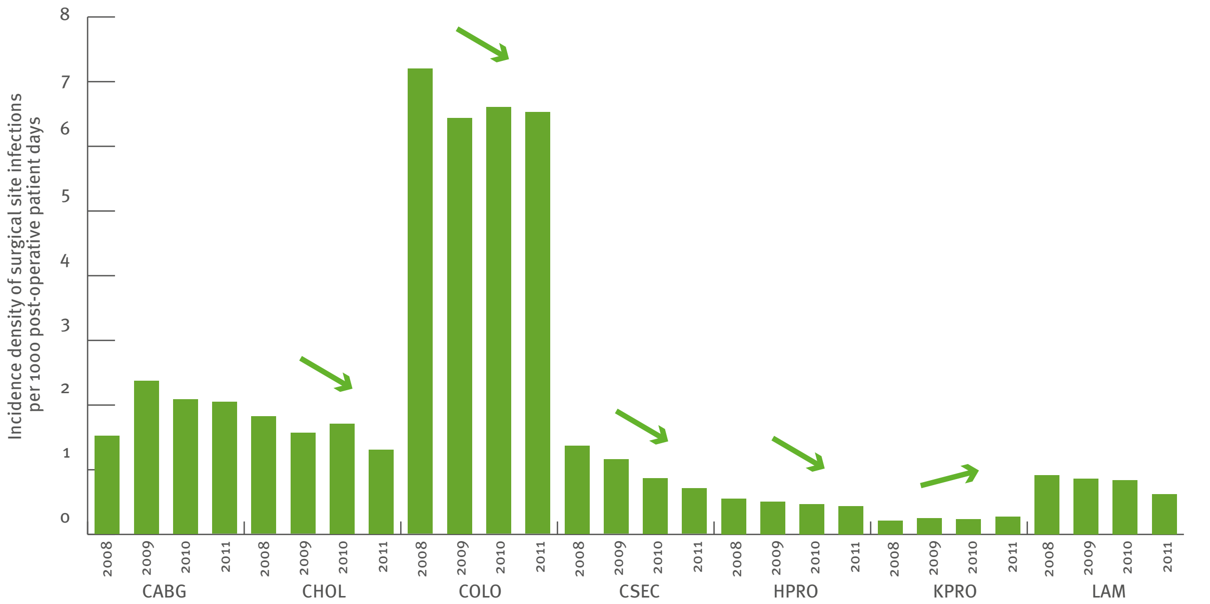
Significant risk-adjusted intra-country decreasing trends for the cumulative incidence of SSIs after hip prosthesis were observed in Italy ($p=0.013$), the Netherlands ($p=0.026$), Portugal ($p<0.001$) and the United Kingdom ($p=0.001$) (Figure 2.6.12). A trend analysis of the in-hospital incidence density of SSIs showed significant decreasing trends in Austria ($p=0.005$), Germany ($p=0.015$), the Netherlands ($p=0.024$) and Portugal ($p=0.035$). In Hungary, a significant increase was observed only for the cumulative incidence of SSIs ($p=0.008$).

Overall, the percentage of SSIs detected after discharge from the hospital in 2011 was 54% (all types of interventions combined). It was the highest in Caesarean sections (86%) and the lowest in colon surgery operations (20%). For 8% of SSIs, the discharge date or the date of onset of the SSI were unknown. For hip prosthesis operations, more than half of the SSIs were detected post-discharge in the following countries: Austria (61%), France (67%), Italy (64%), the Netherlands (81%), Norway (82%), Portugal (63%), Spain (75%) and the United Kingdom (63%) (Figure 2.6.12).

Surveillance of infections acquired in intensive care units

There are two protocols for the surveillance of infections acquired in intensive care units (ICUs): a patient-based ('standard') protocol and a unit-based ('light') protocol. In patient-based surveillance, data include risk factors for risk-adjusted, inter-hospital comparisons and are collected for each patient, whether the patient is infected or not. In unit-based surveillance, denominator data, i.e.

Figure 2.6.12. Incidence density of surgical site infections (diagnosed in hospital) by year and operation type, EU/EEA, 2008–2011



Data source: ECDC, HAI-Net SSI patient-based data 2008–2011

Countries (networks) participating a minimum of three years between 2008 and 2011 by type of operation: CABG: AT, DE, ES, FR, HU, IT (SNICh), LT, MT, NO, UK (England); CHOL: AT, DE, ES, FR, HU, IT (SNICh), LT, NL, NO, PT; COLO: AT, DE, ES, FR, HU, IT (SNICh), LT, NL, NO, PT, UK (England); CSEC: AT, DE, ES, FR, HU, IT (SNICh), LT, NL, NO, PT, UK (England, Scotland and Wales); HPRO: AT, DE, ES, FI, FR, HU, IT (SNICh), LT, NL,NO, PT, UK (England, Northern Ireland, Scotland and Wales); KPRO: AT, DE, ES, FI, FR, HU, IT (SNICh), LT, NL, PT, UK (England, Northern Ireland, Scotland and Wales); LAM: DE, ES, FR, HU, IT (SNICh), NL, PT. Arrows indicate a significant trend of incidence density ($p<0.05$). Note: Only surgical site infections diagnosed in-hospital are included.

CABG: coronary artery bypass graft; CHOL: cholecystectomy; COLO: colon surgery; CSEC: Caesarean section; HPRO: hip prosthesis; KPRO: knee prosthesis; LAM: laminectomy. Since data of all countries were pooled, methodological variations between and within countries may account for a part of the observed trends.

patient-days, are collected for the entire ICU and not individually for each patient.

In 2011, 14 countries (Belgium, Czech Republic, Estonia, France, Germany, two networks in Italy, Lithuania, Luxembourg, Malta, Portugal, Romania, Slovakia, Spain, and two networks in the United Kingdom) reported data from 918 hospitals and 1088 ICUs on 10776 episodes of ICU-acquired pneumonia and 5310 episodes of ICU-acquired bloodstream infections. Four countries (the Czech Republic, Germany, Malta and Romania) only provided unit-based data and one country (Belgium) provided unit-based and patient-based data. The remaining nine countries submitted patient-based data only. As in previous years, Germany did not provide denominator data for patients staying more than two days in an ICU. Therefore, data from Germany were only included in the descriptive analysis of ICU-acquired infections and excluded from the calculation of infection rates. Sweden did not provide data in 2011 because of a change in the national surveillance system. Data from Austria were not yet available at the time of this analysis (April 2013).

ICU-acquired pneumonia

Of 96455 patients staying more than two days in an ICU (patient-based data), 5.6% acquired pneumonia, which was associated with intubation in 92% of the cases. The mean incidence density per ICU was 6.5 pneumonia episodes per 1000 patient-days (ICU IQR: 2.0–9.4), varying from 2.8 in ICUs with less than 30% intubated patients to 5.2 in ICUs with 30–59% intubated patients, and 8.0 in ICUs with ≥60% intubated patients. In patient-based surveillance, the mean device-adjusted rate was 9.9 intubation-associated pneumonia episodes per 1000 intubation-days and varied between 4.3 (United Kingdom) to 18.1 intubation-associated pneumonia episodes per 1000 intubation-days (Estonia) (Table 2.6.3).

Overall, the most frequently isolated microorganisms in ICU-acquired pneumonia episodes were *Pseudomonas aeruginosa*, *Staphylococcus aureus* (with an average percentage of meticillin-resistant isolates (MRSA) of 41.9%), *Klebsiella* spp., *Escherichia coli* and *Candida* spp. (Table 2.6.4). Intercountry differences showed the highest relative frequencies of *Acinetobacter* spp. in Italy, Lithuania, Portugal, Romania, Slovakia and Spain. *Klebsiella*

Table 2.6.3. Intubation-associated pneumonia rates by country, patient-based surveillance, EU/EEA, 2011

Country	Number of ICUs	Number of patients	Average length of ICU stay (days)	Intubation use (days per 100 patient-days)	Intubation-associated pneumonia rate (episodes per 1000 intubation-days)			
					Pooled country mean	25th percentile	Median	75th percentile
Belgium	14	4013	7.9	42.1	14.9	2.6	9.0	19.0
Estonia	5	802	12.0	73.6	18.1	16.1	16.1	24.4
France	183	27702	11.6	61.0	13.9	7.7	12.5	17.5
Italy	94	14076	10.4	71.9	7.8	2.0	5.8	9.6
Lithuania	23	2744	7.9	33.6	12.8	0.0	7.8	30.9
Luxembourg	7	2351	9.1	34.3	4.9	0.8	1.9	7.1
Portugal	27	3774	11.8	71.7	10.0	6.5	10.2	14.4
Slovakia	9	382	9.3	76.6	7.3	0.0	3.0	11.0
Spain	165	28794	8.4	47.9	9.4	4.1	8.1	13.9
United Kingdom[a]	16	10741	9.4	46.4	4.3	0.0	0.6	3.5
All countries	**543**	**95379**	**9.9**	**56.6**	**10.5**	**4.0**	**8.7**	**15.4**

Source: HAI-Net ICU, patient-based surveillance. ICUs that reported data on less than 20 patients were excluded.
(a) Only data from Scotland and Wales. Pooled country mean: global incidence (all patients combined). Percentiles: distribution of incidence per unit.

Table 2.6.4. Percentages of the ten most frequently isolated microorganisms in ICU-acquired pneumonia episodes by country, EU/EEA, 2011

	Belgium	Estonia	France	Germany	Italy	Lithuania	Luxembourg	Portugal	Romania	Slovakia	Spain	United Kingdom	Total
Number of isolates	632	134	3651	4997	1040	116	46	294	18	27	1163	239	**12357**
Pseudomonas aeruginosa	13.9	24.6	19.6	11.4	17.1	12.1	28.3	24.8	11.1	29.6	22.3	5.0	**15.9**
Staphylococcus aureus	9.0	13.4	16.0	14.3	16.4	9.5	2.2	22.8	11.1	0.0	12.8	12.6	**14.6**
Klebsiella spp.	9.2	9.7	7.5	10.5	15.0	25.0	19.6	7.5	16.7	33.3	9.3	13	**10.0**
Escherichia coli	10.1	8.2	9.3	11.6	8.0	4.3	4.3	6.8	5.6	0.0	7.4	9.6	**9.8**
Candida spp.	0.3	9.7	5.1	15.7	3.9	6.0	8.7	2.4	11.1	7.4	2.3	8.4	**8.9**
Enterobacter spp	10.3	10.4	8.3	6.6	3.0	6.9	4.3	4.1	0.0	0.0	5.8	6.3	**6.9**
Acinetobacter spp.	0.9	2.2	2.4	1.3	16.6	11.2	2.2	11.9	27.8	14.8	10.1	5.0	**4.2**
Stenotrophomonas maltophilia	6.3	1.5	3.7	3.6	2.9	1.7	0.0	2.7	0.0	3.7	6.1	5.0	**3.9**
Enterococcus spp.	2.7	0.7	1.7	6.3	2.5	6.0	0.0	1.0	5.6	3.7	2.5	0.8	**3.8**
Serratia spp.	3.5	1.5	3.3	3.6	1.5	1.7	6.5	3.4	5.6	3.7	4.0	4.2	**3.4**

Source: HAI-Net ICU. United Kingdom: data from Scotland and Wales only.

spp. isolates were most frequently reported from Italy, Lithuania, Luxembourg, Romania and Slovakia.

ICU-acquired bloodstream infections

On average, ICU-acquired bloodstream infections occurred in 3.0% of patients staying more than two days in an ICU. The mean incidence density per ICU was 3.5 bloodstream infection episodes per 1000 patient-days (ICU IQR: 1.1-4.7). Bloodstream infections were catheter-related in 36.7% cases, secondary to another infection in 35.1% cases, and of unknown origin in 28.2% cases. In cases where the bloodstream infection was secondary to another infection, the primary infection site was pulmonary in 43.9% cases, affecting the gastrointestinal tract (18.7%), the urinary tract (16.1%), a surgical site (5.8%), skin and soft tissues (4.8%), and other/unknown in the remaining 10.6% cases. In patient-based surveillance, the central vascular catheter (CVC) utilisation rate was on average 70.7 CVC-days per 1000 patient-days. It was the lowest (47.8) in the United Kingdom and the highest (85.7) in Portugal. The mean device-adjusted rate in patients staying more than two days in an ICU was 3.1 CVC-associated bloodstream infection episodes per 1000 CVC-days (ICU IQR: 0.4–4.0), varying from 2.1 in Luxembourg to 3.7 in Estonia.

The most frequently isolated microorganisms in bloodstream infection episodes were coagulase-negative staphylococci, followed by *Enterococcus* spp., *S. aureus*, *Klebsiella* spp. and *Candida* spp. (02.6.5). The percentage of *Acinetobacter* spp. isolates was the highest in Italy, Lithuania, Portugal, Slovakia and Romania. *Klebsiella* spp. was more frequently detected in 2011 (8.7% of all isolates) than in 2010 (6.6% of all isolates) and moved from the seventh to the fourth rank in the list of the ten most frequently isolated microorganisms in ICU-acquired bloodstream infections (Table 2.6.5).

Table 2.6.5. Percentages of the ten most frequently isolated microorganisms in ICU-acquired bloodstream infections by country, EU/EEA, 2011

	Belgium	Czech republic	Estonia	France	Germany	Italy	Lithuania	Luxembourg	Malta	Portugal	Romania	Slovakia	Spain	United Kingdom	Total
Number of isolates	146	85	40	1216	1864	636	63	43	28	218	5	10	1318	113	**5785**
Coagulase-negative staphylococci	14.9	16.5	15.0	17.8	25.1	12.7	33.3	14.0	3.6	13.3	40.0	20.0	26.0	15.0	**21.2**
Enterococcus spp.	18.0	27.1	20.0	9.5	18.9	6.8	14.3	20.9	17.9	9.6	0.0	0.0	12.8	12.4	**13.8**
Staphylococcus aureus	7.5	7.1	2.5	11.6	14.6	10.2	4.8	0.0	10.7	17.0	20.0	10.0	5.7	10.6	**10.9**
Klebsiella spp.	7.5	20.0	7.5	7.3	5.4	17.5	7.9	11.6	7.1	10.1	0.0	20.0	9.6	8.0	**8.7**
Candida spp.	9.9	7.1	10.0	8.1	9.3	5.5	3.2	18.6	14.3	6.4	0.0	0.0	9.4	6.2	**8.5**
Pseudomonas aeruginosa	8.1	1.2	10.0	9.2	4.2	13.1	3.2	0.0	28.6	13.8	0.0	10.0	9.2	0.9	**7.9**
Escherichia coli	11.2	9.4	0.0	10.3	7.0	7.1	9.5	11.6	0	6.9	0.0	0.0	6.3	12.4	**7.8**
Enterobacter spp.	8.1	4.7	15.0	8.3	3.2	3.0	1.6	9.3	10.7	5.0	20.0	20.0	4.8	5.3	**5.1**
Acinetobacter spp.	1.9	1.2	2.5	1.2	1.2	14.3	12.7	0.0	0	7.8	20.0	10.0	5.8	0.9	**4.1**
Serratia spp.	5.0	1.2	2.5	1.7	2.0	2.0	1.6	0.0	3.6	1.4	0.0	0.0	2.3	4.4	**2.1**

Source: HAI-Net ICU. United Kingdom: data from Scotland only.

Table 2.6.6. Percentages of the ten most frequently isolated microorganisms in ICU-acquired urinary tract infections by country, EU/EEA, 2011

	Belgium	Estonia	France	Italy	Lithuania	Luxembourg	Portugal	Slovakia	Romania	Spain	Total
Number of isolates	42	35	1209	19	66	66	89	30	6	831	**2393**
Escherichia coli	23.8	14.3	30.4	36.8	10.6	24.2	25.8	13.3	16.7	24.4	**26.9**
Candida spp.	7.1	28.6	14.1	10.5	25.8	12.1	21.3	3.3	50.0	24.1	**18.1**
Enterococcus spp.	21.4	20.0	14.7	10.5	16.7	22.7	11.2	6.7	0.0	15.5	**15.2**
Pseudomonas aeruginosa	9.5	2.9	12.7	10.5	16.7	15.2	12.4	36.7	0.0	11.6	**12.5**
Klebsiella spp.	16.7	22.9	7.5	10.5	6.1	7.6	9.0	13.3	16.7	9.7	**8.8**
Enterobacter spp.	2.4	2.9	6.8	5.3	3.0	9.1	3.4	3.3	0.0	3.6	**5.3**
Proteus spp.	7.1	2.9	2.6	0.0	4.5	4.5	7.9	10.0	0.0	3.0	**3.2**
Acinetobacter spp.	0.0	0.0	0.7	15.8	10.6	0.0	4.5	10.0	16.7	2.4	**1.9**
Citrobacter spp.	0.0	0.0	2.4	0.0	0.0	0.0	2.2	0.0	0.0	1.0	**1.6**
Other *Enterobacteriaceae*	0.0	0.0	2.1	0.0	0.0	1.5	2.2	0.0	0.0	1.0	**1.5**

Source: HAI-Net ICU.

ICU-acquired urinary tract infections

ICU-acquired urinary tract infections (UTIs) were reported in 2.9% of patients staying more than two days in the ICU, with 96.3% of the infections being associated with the use of a urinary catheter. The mean device-adjusted UTI rate per ICU was 4.1 catheter-associated UTI episodes per 1000 urinary catheter-days (median: 3.0, ICU IQR: 0.9–5.6). On average, urinary catheters were used in 81.2% of the patient days. The most frequently isolated micro-organisms in UTI episodes were *E. coli*, *Candida* spp. and *Enterococcus* spp. (Table 2.6.6).

The reported percentages of resistant isolates in selected bacteria associated with ICU-acquired infections were: oxacillin resistance (MRSA) in 41.6% of *S. aureus* isolates (n=1429); vancomycin resistance in 4.4% of *Enterococcus* spp. isolates (n=772); ceftazidime resistance in 29.8% of *P. aeruginosa* isolates (n=1697); and resistance to third-generation cephalosporins in 32.1% of *E. coli* isolates (n=1373), 51.5% of *Klebsiella* spp. isolates (n=1174) and 55.2% of *Enterobacter* spp. isolates (n=772). Carbapenem resistance was reported in 4.5% of *Klebsiella* spp. isolates (n=829), 1.6% of *E. coli* isolates (n=1177), 4.5% of *Enterobacter* spp. isolates (n=709), 30.5% of *P. aeruginosa* isolates (n=1940), and 80.4% of *Acinetobacter baumannii* (n=397) isolates.

Conclusions

Nineteen countries submitted data for at least one of the two targeted surveillance components. The number of included surgical operations and ICU patients increased compared with last year's report (2010 data)[6]. In 2011, the extension of the surveillance network continued with three additional countries reporting surveillance data on SSIs (Czech Republic, Romania and Slovakia). Two countries began reporting data on infections acquired in ICUs (Czech Republic and Romania).

HAI surveillance at the national level is an essential component of HAI prevention and control. Participating hospitals benefit from a standardised tool which enables them to compare their own performance to that of other hospitals. In addition, participation in the European surveillance network encourages compliance with existing guidelines and helps to correct or improve specific practices as well as evaluate new preventive practices. Participation in the European network could also produce additional benefits at the local level as international comparisons may stimulate interpretations which are not possible at the regional or national level. An example of the effectiveness of surveillance as an HAI prevention tool is the decreasing overall trend of SSI after hip prosthesis, which was confirmed in this report (2011 data). Nevertheless, intercountry differences in surveillance methods persist and further emphasis should be put on harmonisation of surveillance methods in Europe. For a detailed discussion of possible biases when making intercountry comparisons of SSI rates, please refer to previously published reports[5,6].

In ICUs, device-adjusted infection rates of ICU-acquired pneumonia, ICU-acquired bloodstream infections and ICU-acquired urinary tract infections remained stable in 2011 compared with 2010. The importance of antimicrobial resistance in Gram-negative bacteria in European ICUs was confirmed in this report (2011 data).

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3 Annual threat report: Analysis of potential communicable disease threats to public health in the European Union

3.1 Descriptive analysis of emerging threats

Temporal analysis

Threats monitored through daily epidemic intelligence activities

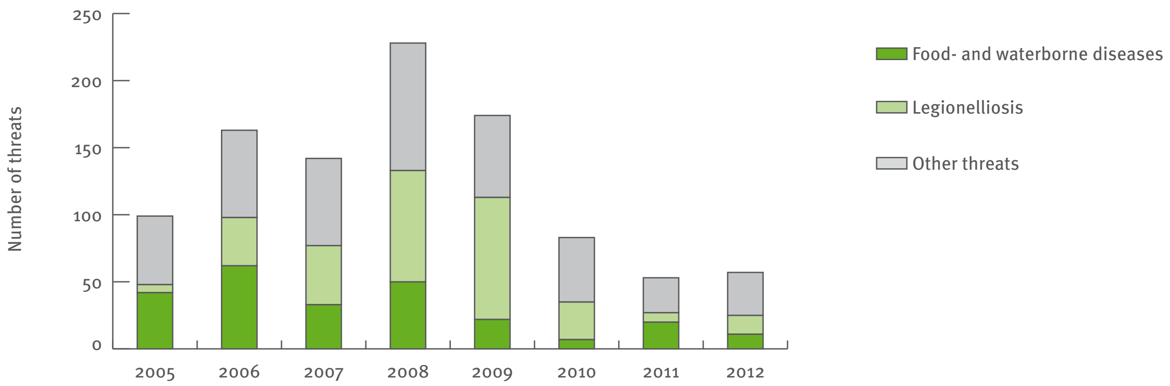
Since June 2005, ECDC has actively monitored 999 threats, with a minimum of 65 in 2011 and a maximum of 251 in 2008 (Figure 3.1.1). The decrease seen since 2008 is mainly due to the fact that two new EPIS modules (EPIS: Epidemic Intelligence Information System) for the rapid exchange of information on food- and waterborne diseases and Legionnaires' disease were implemented in 2010 and 2011. Meanwhile, ECDC refined its criteria for monitoring threats to focus more on assessment rather than pure monitoring.

A median of nine threats per month were monitored between June 2005 and December 2012, with a range of 0–39. The seasonal distribution of threats showed a tendency to peak around summer and autumn for the period January 2006 to December 2012. Seasonality was mainly observed in connection with Legionnaires' disease, food- and waterborne diseases (FWD) and diseases of zoonotic and environmental origin.

The 69 threats monitored in 2012 represent a six per cent increase on 2011. Of these 69 threats, 57 (83%) were created in 2012 and twelve were ongoing. Six threats were carried over from 2011 (measles in the EU, autochthonous malaria in Greece, seasonal influenza in the EU, influenza A(H3N2)v in the USA, Schmallenberg virus in ruminants and the re-entry of the Phobos-Grunt satellite); one from 2010 (cholera outbreak in Haiti and the Dominican Republic); one was re-opened in 2012 and therefore considered to be carried over from 2009 (anthrax among IDU); one from 2006 (global monitoring of dengue fever) and three from 2005 (global monitoring of influenza A(H5N1), poliomyelitis and chikungunya).

The proportion of threats meeting EWRS criteria in 2012 was 23%, which was around half of that in 2011 (46%). The number of monitored threats related to Legionnaires' disease doubled from seven (11%) in 2011 to 14 (21%) in 2012. This was due to several rapidly evolving clusters in Italy (7), Spain (3), Greece, Turkey, Belgium and the UK (one each).

Figure 3.1.1. Number of threats monitored by ECDC per year, June 2005–December 2012



Messages circulated in EWRS

From January 2005 until the end of 2012, 1149 new message threads were posted in EWRS, 73 of which were posted in 2012 (Table 3.1.1). This was a 24% decrease on 2011 and the lowest number seen during the seven-year period. The highest number of new message threads occurred in 2006 and 2009, when 32% and 89% of message threads were related to influenza (avian influenza in 2006 and the influenza A(H1N1) pandemic in 2009) (Figure 3.1.3).

Table 3.1.1. EWRS message threads, comments and selective exchange messages, January 2005–December 2012

Year of posting*	Message threads related to threats	Comments	Selective exchange messages posted
2005	87	131	2
2006	135	222	50
2007	79	259	208
2008	93	209	169
2009	501	811	720
2010	85	225	211
2011	96	441	316
2012	73	155	423
Total	**1149**	**2453**	**2099**

* Comments posted in 2012 can be related to message threads posted in 2011.

The 155 comments posted as replies to messages in 2012 represent a 65% decrease on 2011. This is the second lowest number of replies during the seven-year period. The highest number of comments to original message threads was posted in 2009, when messages and comments were significantly higher due to the influenza A (H1N1) pandemic (Table 3.1.1 and Figure 3.1.3). The highest number of comments posted by month in 2012 was in September, when both the hantavirus outbreak in Yosemite Park, California, and the novel coronavirus were posted as message threads (Figure 3.1.4).

The EWRS systems allows for exchange of messages between selected participants (selective exchange). The number of selective exchange messages has increased constantly since 2010, with an exceptional peak during the pandemic year 2009. Compared to the previous year this represents a 25% increase and is probably mainly due to increased exchange of personal details related to contact tracing activities (Table 3.1.1).

The number of EWRS pages accessed by the restricted users was 66 342, which is a 26% decrease compared to last year. The number of EWRS web consultations shows two clear peaks: the hantavirus outbreak in Yosemite, California, and the novel coronavirus in the Arabian peninsula (Figure 3.1.5).

Figure 3.1.2. Seasonal distribution of threats monitored by ECDC, by month and disease group, January 2006–December 2012

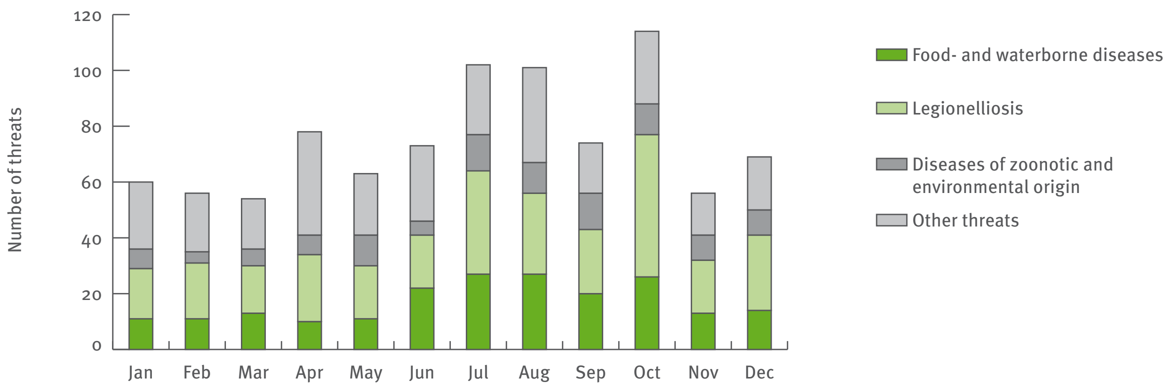
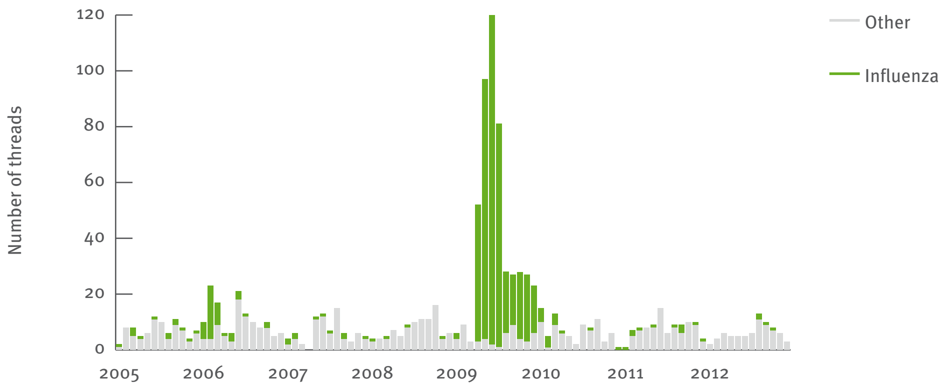


Figure 3.1.3. Number of EWRS message threads by year and month of reporting, January 2005–December 2012



Between 2005 and 2012, ten EU/EEA countries posted more than 200 messages each (including message threads, comments and selective messages); nine countries posted between 100 and 200 items, while the remaining ten countries totalled fewer than 100. Liechtenstein did not post any items. The European Commission posted the highest number of message threads, comments and selective exchange messages during the six-year observation period, accounting for 16% of all postings (Table 3.1.2). ECDC has only posted occasionally on the EWRS due to an existing agreement with the European Commission on channelling ECDC messages through the Directorate General for Health and Consumers.

Analysis by disease group

During the 7.5 year monitoring period, the proportion of threats related to food- and waterborne diseases decreased from 42% in 2005 to a low of 10% in 2010, but increased again to 35% of threats in 2011 and 38% in 2012 (26 threats, 14 of which were due to Legionnaires' disease) (Table 3.1.2 and Figure 3.1.6). This is partly due to the fact that Legionnaires' disease moved from

Figure 3.1.4. Number of EWRS message threads, comments and selective exchange messages, by month, January 2012–December 2012

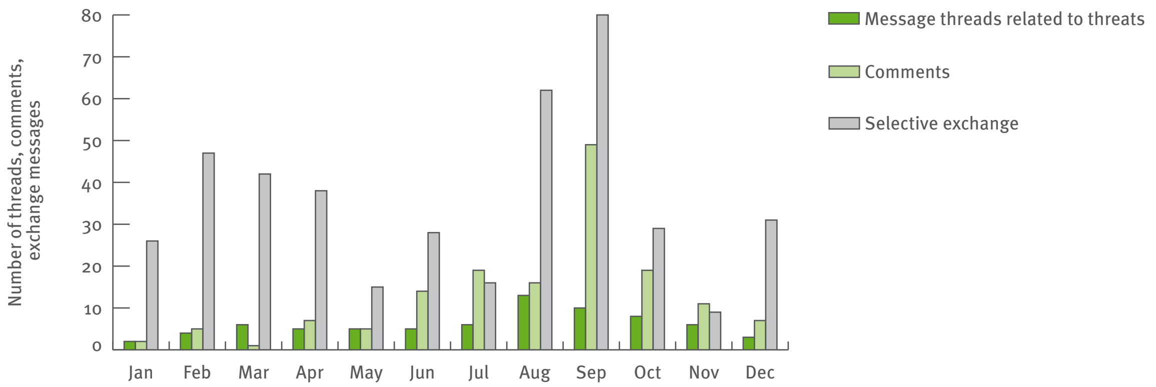


Figure 3.1.5. Number of EWRS accesses by EWRS users per day, January 2011–December 2012

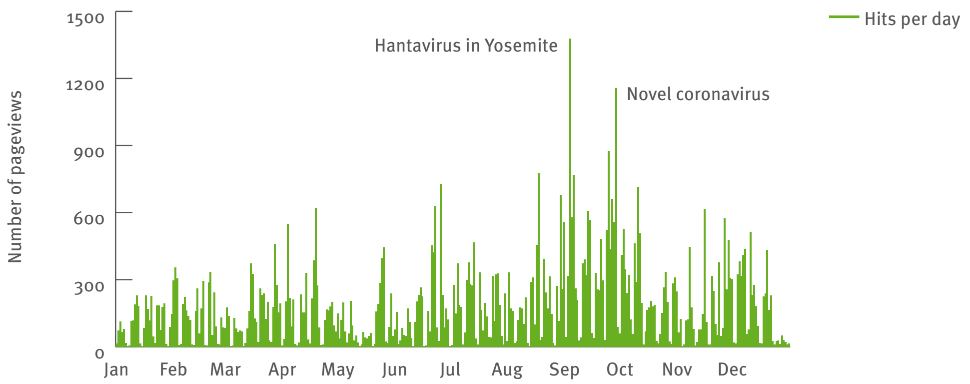
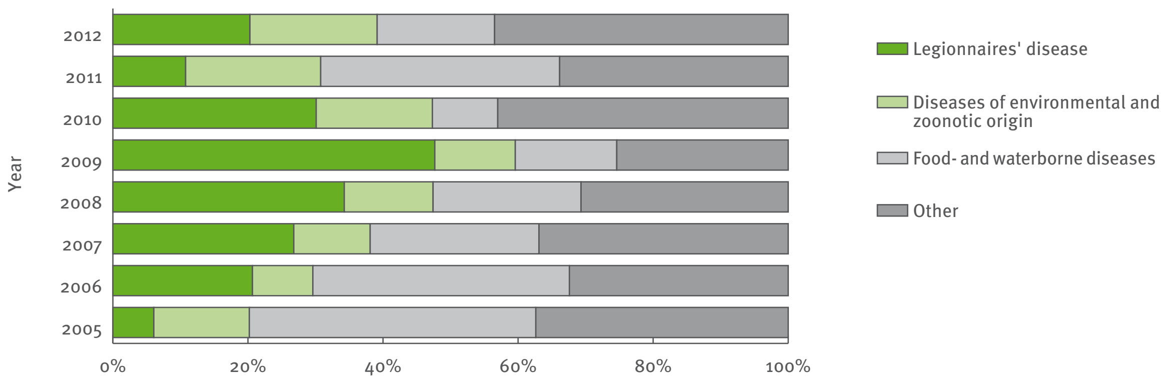


Figure 3.1.6. Proportion of threats by disease group and year, June 2005–December 2012



'diseases of environmental and zoonotic origin' to 'food- and waterborne diseases' in 2011.

Eleven threats (16%) concerned events not directly related to diseases. Eight of these threats involved three major mass gathering events which took place in Europe, namely the EURO football tournament in Poland and Ukraine and the Olympics and Paralympics in London. One threat involved severe respiratory syndrome due to a novel coronavirus, one an unknown disease causing 52 fatalities in young children in Cambodia (probably due to enterovirus 71) and one involved the re-entry of the Phobos Grunt satellite.

Thirteen (19%) threats were related to diseases of environmental and zoonotic origin (dengue fever outbreak in Madeira, West Nile virus monitoring in Europe, malaria in Greece, hantavirus pulmonary syndrome outbreak in Yosemite Park, Marburg virus outbreak in Uganda, foot-and-mouth disease in Libya, Schmallenberg virus in ruminants, global monitoring of dengue and chikungunya) and three were related to imported diseases in returning travellers (rabies, human African trypanosomiasis and Crimean Congo haemorrhagic fever). Eight threats were related to influenza, six to vaccine-preventable and invasive bacterial diseases (monitoring of measles and rubella in Europe, increase in adverse events following BCG vaccination in Romania, global

Table 3.1.2. EWRS postings by category and reporting country, January 2005–December 2012

Member States	Message threads related to threats	Comments	Selective exchange	Total
EU	181	386	364	**931**
France	74	85	158	**317**
United Kingdom	73	72	88	**233**
Italy	72	85	109	**266**
Germany	68	181	178	**427**
Portugal	63	116	50	**229**
Sweden	63	92	128	**283**
Ireland	44	72	32	**148**
Denmark	39	104	70	**213**
Finland	39	25	48	**112**
Spain	36	103	157	**296**
Romania	35	96	67	**198**
Netherlands	33	62	125	**220**
Greece	29	42	17	**88**
Norway	28	50	19	**97**
Belgium	27	90	57	**174**
Czech Republic	23	58	51	**132**
Estonia	22	59	17	**98**
Iceland	22	43	4	**69**
Latvia	20	69	31	**120**
Lithuania	20	94	24	**138**
Slovakia	20	71	40	**131**
Hungary	19	52	36	**107**
Austria	18	80	126	**224**
Luxembourg	18	41	3	**62**
Slovenia	17	51	2	**70**
Poland	14	40	20	**74**
Malta	12	49	19	**80**
Bulgaria	11	30	22	**63**
Cyprus	7	45	8	**60**
ECDC	2	10	29	**41**
Total	**1149**	**2453**	**2099**	**5701**

Table 3.1.3. Percentage of threats monitored by year and disease group, June 2005–December 2012

Disease group	2005	2006	2007	2008	2009	2010	2011	2012
Antimicrobial resistance and healthcare associated infections	3%	2%	1%	0%	0%	1%	3%	3%
Food- and waterborne diseases	42%	38%	25%	22%	15%	10%	35%	38%
Hepatitis, HIV, STI and blood-borne diseases	1%	1%	1%	1%	2%	2%	3%	1%
Influenza	6%	3%	2%	4%	7%	8%	11%	11%
Other environmental or zoonotic diseases	20%	30%	38%	47%	59%	47%	31%	19%
Tuberculosis	2%	2%	10%	5%	4%	0%	0%	3%
Vaccine-preventable and invasive bacterial diseases	13%	6%	10%	11%	9%	13%	6%	9%
Not applicable	12%	18%	13%	9%	3%	19%	11%	16%
Total	**99**	**179**	**168**	**251**	**192**	**93**	**65**	**69**

monitoring of poliomyelitis, a case of non-toxin producing *Corynebacterium diphtheriae* in Italy and a case of meningitis on a flight from Venezuela to Italy due to *Enterococcus faecalis*). In 2012, two threats were related to drug-resistant tuberculosis (increase of drug-resistant tuberculosis in India and bus travel of an XDR tuberculosis case from Moldova to Portugal) and two to contamination of medical products (fungal endophthalmitis and potential contamination of an organ transfusion perfusion with *Bacillus cereus*). One threat related to 13 new confirmed cases of anthrax in intravenous drug users, including five fatalities from four EU countries (Germany: four cases, one fatal; Denmark: two cases, one fatal; France: one case; and UK: six cases, three fatal). The 2012 anthrax outbreak among injecting drug users has been linked to the 2009–2010 outbreak with 127 cases in the EU (England: five; Scotland: 119; and three cases in Germany). Of seven *B. anthracis* isolates tested in 2012, two isolates from the United Kingdom were indistinguishable from the 2009–2010 strain and three isolates from Germany and two from Denmark were almost identical to the 2009–2010 strain.

Analysis by initial source of notification

Confidential sources are defined as sources with restricted access, for example disease-specific surveillance networks, EWRS or information sent to ECDC by Member States or the World Health Organization (WHO). All sources publicly accessible on the internet are considered public sources.

In 2012, the proportion of newly monitored threats originating from confidential sources was 59% (range 59–81%, excluding the incomplete year 2005). This represents a 12% decrease on 2011. Among confidential sources, EWRS and information from Member States accounted for 14% each and all other confidential sources for 31% during 2012 (Table 3.1.4). The most common public sources accounted for 21% of all monitored threats. These were followed by public reports available on the internet (11%) (Table 3.1.4).

Table 3.1.4. Percentage of new threats monitored per year by initial source of information, EU/EEA countries, June 2005–December 2012

Initial source of information	Percentage of new threats monitored per year								
	2005	2006	2007	2008	2009	2010	2011	2012	Total
Confidential sources									
EPIS for food- and waterborne diseases	n.a.	n.a.	n.a.	n.a.	n.a.	2	8	2	1
EWGLI/ELDSNet	2	18	28	34	49	30	9	5	29
EWRS	23	32	30	33	24	19	26	14	28
WHO	17	9	4	1	2	6	11	3	5
Information from Member States	1	3	1	3	1	5	11	14	2
European disease surveillance networks	9	7	6	2	3	3	0	2	4
Other confidential sources	0	1	3	4	2	11	6	19	3
Total (%/year)	**52**	**70**	**72**	**77**	**81**	**76**	**71**	**59**	**72**
Public sources									
ProMED	37	9	14	4	3	1	2	7	10
MedISYS	2	3	0	0	4	0	6	2	2
GPHIN	4	12	3	0	2	0	2	0	3
Eurosurveillance	0	1	1	0	0	0	0	0	0
Public reports available on the internet	5	5	8	8	4	8	8	11	7
Other public sources	0	0	2	11	6	15	11	21	6
Total (%/year)	**48**	**30**	**28**	**23**	**19**	**24**	**29**	**41**	**28**
Total number of new threats	**99**	**163**	**142**	**228**	**174**	**83**	**53**	**57**	**999**

The number of threats in this table does not correspond to the number of monitored threats as only threats which were newly opened in the respective year were included.
n.a.: not applicable as network did not exist at that time.

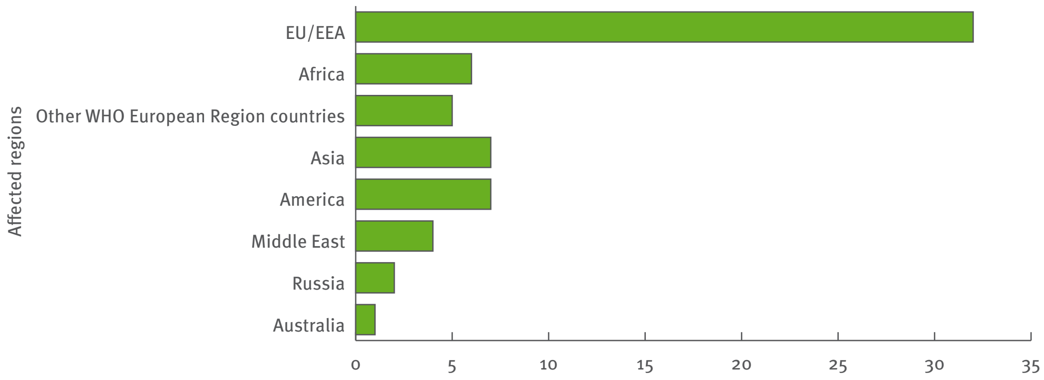
Analysis by region of origin and affected countries

The number of affected countries and regions differs from the number of monitored threats as a threat may affect several countries or regions. In 2012, 24 of 69 (35%) monitored threats originated from outside Europe.

Fifty per cent of monitored threats affected EU/EEA countries, followed by America and Asia (11% each) Africa (9%), other countries in the WHO European Region (excluding EU/EEA) (8%), the Middle East (6%), Russia (3%) and Australia (2%) (Figure 3.1.7).

The United Kingdom was the country affected by the highest number of threats (10 threats), followed by Germany (seven) and Belgium (five), Italy (four), Denmark, France, Romania, Spain (three each), Greece, Poland (two each), Austria, the Czech Republic, Hungary, Lithuania, Norway, Portugal and Sweden (one each).

Figure 3.1.7. Number of monitored threats by affected regions, January–December 2012



3.2 Response support to threats

Published rapid risk assessments and epidemiological updates

In 2012, ECDC produced 39 risk assessments. Six were longer-term risk assessments, requiring more than the usual two to three days between production and publication: laboratory-created A(H5N1) viruses transmissible between ferrets, HIV in Greece, swine-origin triple re-assortant influenza A(H3N2) variant viruses in North America, change of testing requirements for partner donation of reproductive cells related to communicable diseases, seasonal influenza 2011–2012 in Europe (EU/EEA countries), and HTLV-I/II transmission by tissue/cell transplantation; 32 were rapid risk assessments, of which 16 were original assessments and 16 updates (Table 3.2.1). This represents a 23% increase compared with 2011. Additionally, 29 epidemiological updates were produced.

All risk assessments (RA), rapid risk assessments (RRA), updates (UD) of rapid risk assessments and epidemiological updates (EpiU) (hereinafter referred to as outputs) were directly or indirectly related to communicable diseases. Risk assessments and their updates, including epidemiological updates, were spread throughout the year (range 1–6 per month). The seasonal distribution of outputs suggests an increasing trend with peaks in July, September and November, and another peak in February. None of the peaks was related to one specific topic (Figure 3.1.7, Table 3.2.2).

The highest number of outputs was related to dengue fever in Europe (seven of nine were related to the outbreak in Madeira, Portugal, and two to a potential autochthonous case in Greece which was confirmed to be negative). This was followed by eight outputs related to Legionnaires' disease (five associated with a hotel in Calpe, Spain, two with a community outbreak in Edinburgh, Scotland, and one with a community outbreak in Blanes, Spain) (Table 3.2.1, Table 3.2.2, Figure 3.1.9).

Ninety-four per cent of all outputs in 2012 were published on the ECDC website. This included all risk assessments, all epidemiological updates, all but three original RRAs (outbreak of typhoid fever in Zimbabwe and role of vaccination against typhoid fever; the potential contamination of Viaspan organ perfusion solution,

Figure 3.1.8. Distribution of risk assessments, rapid risk assessments, updates of rapid risk assessments and epidemiological updates by month, January–December 2012

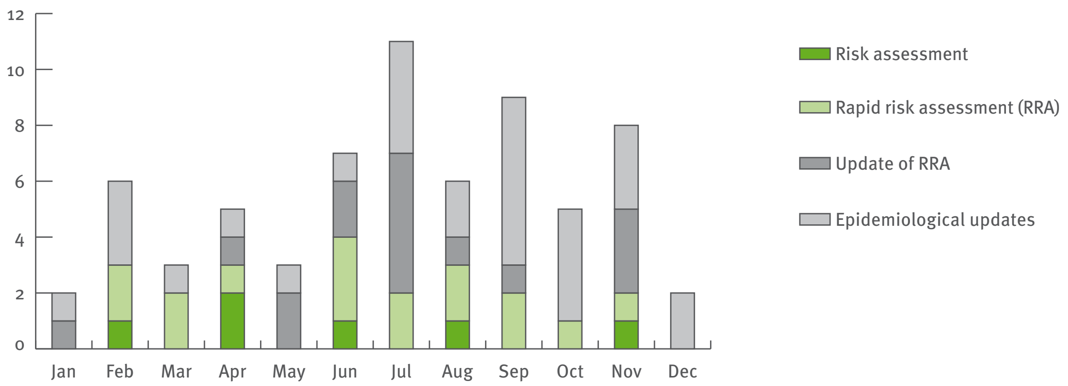


Table 3.2.1. Distribution of ECDC risk assessments by subject and countries involved, type and date of publication, January–December 2012

Subject	Date of EWRS posting	Date of publication on ECDC website	Type of output
Human fatality from highly pathogenic avian influenza A(H5N1) virus infection in Guangdong province, China	-	05/01/2012	Update
Outbreak of typhoid fever in Zimbabwe and role of vaccination against typhoid fever	-	-	RRA
Laboratory-created A(H5N1) viruses transmissible between ferrets	-	29/02/2012	RA
Transmission of foot-and-mouth disease to humans visiting affected areas in northern Africa	-	21/02/2012	RRA
Outbreak of measles in Ukraine and potential for spread in the EU	14/03/2012	-	RRA
HTLV-I/II transmission by tissue/cell transplantation in the EU-Part1	-	03/04/2012	RA
HTLV-I/II transmission by tissue/cell transplantation in the EU-Part2		20/06/2012	RA
Potential contamination of Viaspan organ perfusion solution, a product for preservation of organs prior to transplantation	-	-	RRA
Seasonal influenza 2011–2012 in Europe (EU/EEA countries)	-	12/03/2012	RA
Potential contamination of Viaspan organ perfusion solution, a product for preservation of organs prior to transplantation	-	23/04/2012	Update
New Orthobunyavirus isolated from infected cattle and small livestock. Potential implications for human health – Joint ECDC/RIVM/RKI update	07/05/2012	08/05/2012	Update
Outbreak of Legionnaires’ disease in a hotel in Calpe, Spain	24/05/2012	24/05/2012	Update
Outbreak of Legionnaires’ disease in a hotel in Calpe, Spain	01/06/2012	04/06/2012	Update
A community outbreak of Legionnaires' disease in Edinburgh, Scotland	08/06/2012	-	RRA
Change of testing requirements for partner donation of reproductive cells	-	12/06/2012	RA
A community outbreak of Legionnaires' disease in Edinburgh, Scotland	14/06/2012	14/06/2012	Update
Anthrax in intravenous drug users, Germany	22/06/2012	22/06/2012	RRA
Meningitis outbreak, Suceava county, Romania, June 2012	22/06/2012	25/06/2012	RRA
Outbreak of Legionnaires' disease in a hotel in Calpe, Spain	04/07/2012	06/07/2012	Update
Anthrax in intravenous drug users, Germany	06/07/2012	09/07/2012	Update
Outbreak of Legionnaires' disease in a hotel in Calpe, Spain	11/07/2012	12/07/2012	Update
Outbreak of cholera in Cuba, potential risk for European travellers	12/07/2012	12/07/2012	RRA
Anthrax in intravenous drug users, Germany, France and Denmark	16/07/2012	16/07/2012	Update
West Nile virus in Europe	13/07/2012	13/07/2012	Update
Multi-country outbreak of *Salmonella* Stanley infections	27/07/2012	30/07/2012	RRA
Outbreak of Ebola haemorrhagic fever in Uganda	02/08/2012	03/08/2012	RRA
Swine-origin triple re-assortant influenza A(H3N2) variant viruses in North America	17/08/2012	17/08/2012	RA
Outbreak of Ebola haemorrhagic fever in the Democratic Republic of Congo	22/08/2012	23/08/2012	RRA
Multi-country outbreak of *Salmonella* Stanley infections	29/08/2012	-	Update
Hantavirus pulmonary syndrome outbreak in Yosemite Park, California, USA	05/09/2012	05/09/2012	RRA
Multi-country outbreak of *Salmonella* Stanley infections in the EU	20/09/2012	20/09/2012	Update
Dengue fever in Madeira, Portugal	10/10/2012	11/10/2012	RRA
Dengue fever in Madeira, Portugal	19/11/2012	20/11/2012	Update
Increase in cryptosporidiosis observed in the Netherlands, United Kingdom and Germany	19/11/2012	19/11/2012	RRA
Novel coronavirus associated with severe respiratory disease in the Arabian Peninsula	23/09/2012	26/09/2012	RRA
Severe respiratory disease associated with a novel coronavirus in the Arabian peninsula	25/11/2012	26/11/2012	Update
HIV in Greece	-	30/11/2012	RA
Severe respiratory disease associated with a novel coronavirus in the Arabian peninsula	07/12/2012	07/12/2012	Update

a product for preservation of organs prior to transplantation; and transmission of foot-and-mouth disease to humans visiting affected areas in northern Africa) and all but two updates of RRAs (a community outbreak of Legionnaires' disease in Edinburgh and a multi-country outbreak of *Salmonella* Stanley infections) (Table 3.2.1).

Seventy-four per cent of outputs, excluding the epidemiological updates, which are not intended to be distributed through EWRS, were shared with the Member States and the European Commission through EWRS: one of the five risk assessments and the majority of original RRAs and updates (88% each). ECDC usually receives requests to prepare RRAs from the Health Threats Unit (C3) of the Directorate General for Health and Consumers (DG SANCO).

Mobilisation of expertise

ECDC may support countries in the coordination of the investigation of outbreaks and threats and in preparedness activities related to communicable diseases, either at the request of EU/EEA Member States or countries outside the EU. In 2012, several support missions were undertaken (Table 3.2.3).

Figure 3.1.9. Distribution of risk assessments, rapid risk assessments, updates of rapid risk assessments and epidemiological updates by topic, January–December 2012

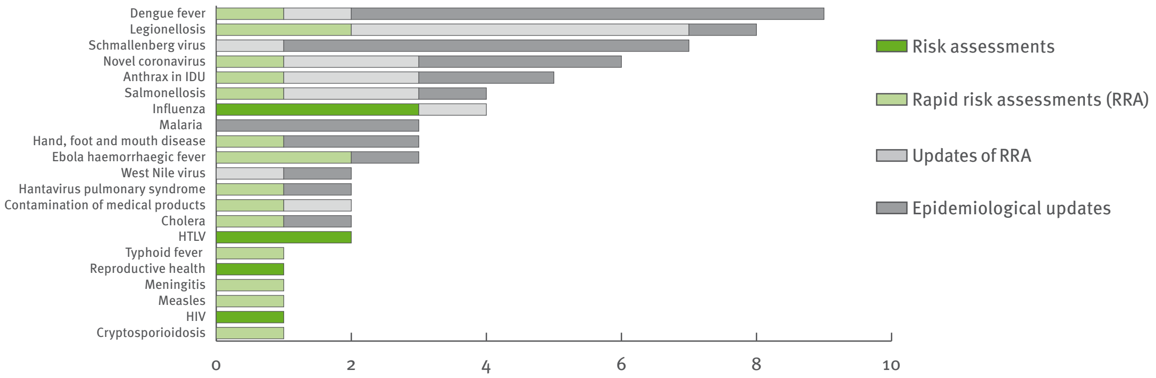


Table 3.2.2. Distribution of ECDC epidemiological updates by subject, countries involved and date of publication, January–December 2012

Subject	Date of publication on ECDC website
Schmallenberg virus isolated from infected cattle and small livestock in the European Union, potential implications for human health	25/01/2012
Mycoplasma pneumoniae infections – recent increases reported in EU countries	03/02/2012
Schmallenberg virus isolated from ruminants in the EU, implications for human health	15/02/2012
Schmallenberg virus isolated from ruminants in the EU, implications for human health	20/02/2012
Schmallenberg virus isolated from ruminants in the EU, implications for human health	13/03/2012
Schmallenberg virus isolated from ruminants in the EU, implications for human health	24/04/2012
Hand, foot and mouth disease in Asia	30/05/2012
Local case of malaria in Greece	26/06/2012
Ongoing outbreak of cholera in Cuba – potential risk for European travellers	10/07/2012
Fatal paediatric infections associated with Enterovirus 71 in Cambodia and hand, foot and mouth disease in Asia	13/07/2012
Malaria in Greece	20/07/2012
Anthrax cases among injecting drug users in the European Union	31/07/2012
Ebola virus outbreak in Uganda	08/08/2012
West Nile virus outbreak in the USA	30/08/2012
Possible local transmission of dengue virus in Greece	07/09/2012
Malaria risk to travellers in Greece remains low	07/09/2012
Hantavirus outbreak at Yosemite Park, California, USA	10/09/2012
Anthrax cases among injecting drug users in the European Union	12/09/2012
Outbreak of Legionnaires' disease in Blanes, Catalonia, Spain	14/09/2012
Two cases of a novel coronavirus laboratory confirmed in the Arabian Peninsula	24/09/2012
No local transmission of dengue virus in Greece	05/10/2012
Dengue cases in Madeira, Portugal	09/10/2012
Dengue cases in Madeira, Portugal	18/10/2012
Dengue fever outbreak in Madeira, Portugal, and confirmed cases in other European countries	25/10/2012
Dengue fever outbreak in Madeira, Portugal	13/12/2012

For example, ECDC undertook a mission to support the first outbreak of autochthonous dengue fever in Madeira, Portugal, with over 2 000 local and more than 70 exported cases reported by eleven EU/EEA countries (including mainland Portugal) and two non-EU/EEA countries between October and December 2012 (for further details see Chapter 3.3).

Following the emergence of West Nile virus (WNV) in Greece in 2010–11 and the re-introduction of malaria with locally acquired cases in several locations in 2011, ECDC conducted two follow-up field missions to support Greece's CDC. Support was provided for the implementation of enhanced surveillance for human cases, mosquito surveillance, avian and equine surveillance for WNV and mosquito surveillance in preparation for the upcoming malaria season. The malaria assessment was conducted in collaboration with WHO's Regional Office for Europe. An ECDC/WHO joint mission reviewed the risk of a potential re-establishment of malaria transmission in Greece and addressed preventive measures, including blood safety issues.

ECDC collaborates closely with WHO's Global Outbreak and Alert Network (GOARN) and distributed requests for five field missions to its competent bodies and the EPIET network, namely a yellow fever outbreak in Darfur, Sudan; a Marburg haemorrhagic fever outbreak in Uganda; an Ebola haemorrhagic fever outbreak in the Democratic Republic of Congo; a cholera outbreak in Sierra Leone; and a request for a response to food insecurity in Mali and Mauretania.

Targeted expert consultations

During 2012, three expert consultations were conducted, all of which were related to vector-borne diseases (Table 3.2.4).

EPIS for food- and waterborne diseases (FWD)

Food- and waterborne threats

The Epidemic Intelligence Information System for Food- and Waterborne Diseases and Zoonoses (EPIS-FWD), launched in March 2010, is a non-public, password-protected, and web-based communication platform bringing together multidisciplinary experts (e.g. epidemiologists, microbiologists and risk managers) to ensure the early detection and coordination of multistate outbreaks. The majority of participating experts come from the 27 European Union Member States and EEA countries; however, experts from Australia, Canada, Japan, New Zealand, South Africa, Switzerland, Turkey and the USA also contribute actively to the information exchange.

Table 3.2.3. ECDC missions related to outbreak response support and preparedness activities, January–December 2012

Subject	Country	Deployed ECDC staff	Deployed EPIET fellows	Month of support mission
WNV and malaria outbreaks 2011 follow-up	Greece	2		January
Immunisation programme review*	Ukraine	1		February
EURO 2012 football tournament	Poland/ Ukraine	2	5	June–July
London 2012 Olympics	UK	1		July–August
Legionnaires' disease outbreak, Calpe, Spain	Spain	1		July
Dengue fever outbreak Madeira	Portugal	4	1	October
West Nile and malaria**	Greece	2		November
Adverse events following BCG vaccination*	Romania	1		November
Revision of the national measles elimination plan	Austria	1		Several missions

* In collaboration with WHO
** In collaboration with WHO for malaria

Table 3.2.4. Distribution of expert consultations published and conducted in 2012 by subject, location, date of meeting and date of publication

Subject	Location	Date of meeting	Date of publication of report
Consultation on *Plasmodium vivax* transmission risk	Stockholm	17–18 Jan 2012	April 2012
Presentation of the ECDC guidance for surveillance of invasive mosquito species and its evaluation in the field	Brussels	21 Nov 2012	August 2012
Expert input on critical appraisal of the reliability of laboratory test for Lyme borreliosis in the EU	Stockholm	29–30 Nov 2012	To be distributed only to experts on Lyme borreliosis

Pathogens and vehicles of infection

In 2012, urgent inquiries were made in relation to four diseases: salmonellosis (19), verotoxigenic *Escherichia coli* (seven), listeriosis (four) and cryptosporidiosis (two).

Among the *Salmonella* infections, the most frequently reported serotype was *S.* Typhimurium (five), followed by *S.* Poona (two). The other serotypes reported were *S.* Agona, *S.* Derby, *S.* Strathcona, *S.* Isangi, *S.* Enteritidis, *S.* Infantis, *S.* Mikawasima, *S.* Newport, *S.* Stanley and *S.* Thompson (one each).

A detailed breakdown of the pathogens reported in urgent inquiries is shown in Table 3.2.5.

For 16 urgent inquiries (50%), a vehicle of infection was suspected or confirmed, representing a decrease compared to previous years (69% in 2009, 74% in 2010 and 63% in 2011).

Of the urgent inquiries for which a vehicle of infection was suspected or confirmed, bovine meat and derivatives (3) were the most commonly reported, followed by fish and fish products (2), vegetables, juices and other derivatives (2) and cheese (2) (Table 3.2.5).

Affected countries

In 2012, 23 urgent inquiries (72%) related to only one country, compared with 35 (75%) in 2011 and 22 (71%) in 2010. Twenty-nine urgent inquiries (91%) were limited to EU/EEA countries and three urgent inquiries (9%) involved non-EU/EEA countries (USA) – the same percentage as in 2011.

The urgent inquiries involving the most countries (nine) related to a *S. Stanley* outbreak, most likely due to the consumption of contaminated turkey meat, a *S. Mikawasima* outbreak and an unusual increase in *Cryptosporidium* infections where the source was not identified (five and four countries, respectively).

Table 3.2.5. Distribution of pathogens associated with urgent inquiries and suspected and confirmed vehicles of infection, 2012

Pathogen	Number of urgent inquiries	Suspected and confirmed vehicle of infection
Cryptosporidium hominis	1	Unknown
Cryptosporidium parvum	1	Unknown
Listeria monocytogenes	4	Cheese (2), unknown (2)
Salmonella Agona	1	Unknown
Salmonella Bareilly	1	Fish and fish products
Salmonella Blockley	1	Unknown
Salmonella Derby	1	Pork and pork products
Salmonella Strathcona	1	Vegetables, juices and other products thereof
Salmonella Isangi	1	Unknown
Salmonella Enteritidis	1	Unknown
Salmonella Infantis	1	Other foods (pet food)
Salmonella Mikawasima	1	Unknown
Salmonella Newport	1	Fruit, berries and juices and other products thereof
Salmonella Poona	2	Cereal products including rice and seeds/pulses (nuts, almonds), unknown
Salmonella Stanley	1	Turkey meat and products thereof
Salmonella Thompson	1	Fish and fish products
Salmonella Typhimurium	5	Bovine meat and products thereof (1), contact with other wild animal(s) (hedgehog) (1), vegetables and juices and other products thereof (1), unknown (2)
Verotoxigenic *Escherichia coli*	7	Bovine meat and products thereof (2), herbs and spices (1), travel associated infection (1), unknown (4)
Total	32	Source suspected or identified (16), unknown (16)

3.3 Threats of particular interest

Severe acute respiratory syndrome due to a novel coronavirus

On 19 April 2012, ECDC epidemic intelligence picked up a report from the Jordanian Ministry of Health about an outbreak of eleven cases of an unknown respiratory disease, which also affected seven nurses and a doctor working in an intensive care unit at a hospital in Zarqa, Jordan[1–3]. One of the nurses with underlying conditions was reported to have died, another death was confirmed later. The cause of the infection was not identified at that time but a coronavirus infection was reported in two cases. On 30 November 2012, WHO confirmed that two samples from the fatal cases had been tested and found to be positive for novel coronavirus, belonging to the group of β-coronaviruses which are closely related to bat coronaviruses (80% homology) but distinct from SARS-CoV, which caused the 2002/2003 international SARS outbreak, with 8 422 cases including 916 deaths[4].

On 20 September 2012, ProMED reported the first laboratory-confirmed case of the novel coronavirus, called MERS-CoV, in a 60-year-old patient in Jeddah, Saudi Arabia, who was admitted to hospital on 13 June with severe pneumonia. He developed acute renal failure and died on 24 June. The virus genome was later sequenced at the Erasmus Medical Centre, Rotterdam[5]. The second case was reported two days later by the UK Health Protection Agency (99.5% sequence homology, one nucleotide difference)[6,7].

On 24 September 2012, ECDC published the first rapid risk assessment concluding that there was no evidence of person-to-person transmission, e.g. to close contacts or healthcare workers[8]. At this point in time it was still unknown that the two cases from the clusters of healthcare workers in Jordan had been caused by the novel coronavirus. Updates of the risk assessment followed[9].

Between April and December 2012, nine laboratory-confirmed cases of the novel coronavirus were reported, five of which were from Saudi Arabia (including three fatalities), two from Qatar, and two (both fatal) from Jordan, resulting in a case fatality of 56%. All nine cases suffered from severe respiratory syndrome and five also experienced acute renal failure.

All infections appear to have been locally acquired in the Arabian peninsula, and cases had onset of symptoms over a period of at least seven months. The wide geographical distribution, the long intervals between cases and clusters, and the absence of mild or asymptomatic human infections (which could maintain a chain of transmission between outbreaks), point to intermittent zoonotic transmission or an environmental source. At the time of writing, there is only very limited basic epidemiological information available about the disease caused by this novel coronavirus (e.g. geographical distribution, incubation period, infectiousness, reservoirs, routes of transmission, and duration of viral shedding from infected human cases). No animal reservoir or mode of zoonotic transmission has yet been identified for this novel coronavirus, which appears closely related to bat coronaviruses (C. Drosten, personal communication].

Hantavirus pulmonary syndrome outbreak in visitors to Yosemite Park, California

Hantavirus pulmonary syndrome (HPS) is an acute, zoonotic viral disease; humans are infected by inhalation of infected rodent excreta or by direct contact with rodents: the deer mouse (*Peromyscus maniculatus*) is the main reservoir in North America. The case fatality in humans is around 36%[10]. Several species of hantavirus have been identified on the American continent but the Sin Nombre virus is responsible for most cases of HPS in North America.

On 28 August 2012, epidemic intelligence at ECDC picked up an alert sent by the Yosemite National Park authorities in California announcing that two further cases of hantavirus pulmonary syndrome had been confirmed, in addition to the first two cases announced on 16 August. All of the cases had stayed overnight in the park.

By 30 October 2012, ten laboratory-confirmed cases (Sin Nombre virus), including three fatalities, had been identified by the US public health authorities, ranging in age between 12 and 56 years[11]. Tent cabins at the Curry Village camp site in the Yosemite Valley were identified as the common site of exposure for nine of the cases.

On 4 September 2012, ECDC produced a rapid risk assessment[12] which examined the risk for European travellers who visited Yosemite. Five hundred and eighty eight individuals from 17 EU/EEA Member States were identified by the US authorities as having booked accommodation at the site and therefore potentially been exposed to hantaviruses. The US CDC and the park authorities passed on the contact details of the potentially exposed EU citizens to the European Commission who in turn informed the Member States. No cases were identified.

Dengue fever outbreak in Madeira, Portugal

On 3 October 2012, the Public Health Authority of Portugal (Direção-Geral da Saúde) reported two autochthonous cases of dengue infection in patients residing in Funchal (Autonomous Region of Madeira, Portugal) where *Aedes aegypti*, the principal vector of dengue, was recorded for the first time in 2005. The ensuing dengue outbreak (DENV-1) marked the first autochthonous outbreak of dengue fever in the European Union. Although only sporadic autochthonous transmission of dengue was reported in Europe in 2010 (in southern France and Croatia), the outbreak in Cape Verde in 2009 and the outbreak on the island of Madeira in 2012 support the idea that dengue circulation is spreading in several inter-tropical areas of the globe. This dengue outbreak was not entirely unexpected, given the established presence of the *Aedes aegypti* mosquito due to the suitable environmental conditions of the southern coast of Madeira.

In the third week of January 2013, the Portuguese Ministry of Health reported 2 164 cases of dengue (probable and laboratory confirmed) from the Autonomous Region of Madeira. No severe cases or deaths were reported during the course of the outbreak. For this period, the overall male-to-female ratio was 1.44:1. The incidence rate for 10 000 inhabitants by age group shows a higher attack rate among 25–64-year-old women. During the same period, seventy-five patients were diagnosed with dengue infection after returning from Madeira to the European mainland: 11 in mainland Portugal, 23 in the UK, 19 in Germany, three in France, five in Sweden, four in Finland, two in Denmark, two in Austria, and two in Norway. Croatia, Slovenia, Spain and Switzerland all reported one case each. The latest case was reported on 1 February 2013 from Finland.

On 11 October 2012, ECDC published a first rapid risk assessment[13]. Between 22 October and 7 November 2012, a field mission was conducted to support data collection (electronic surveillance system for timely monitoring of the outbreak) and provide guidance for vector surveillance and control activities. On 20 November, ECDC published an update of the rapid risk assessment[14] which outlined the measures implemented in response to the outbreak and strongly advised residents and travellers to take individual protective measures in order to avoid mosquito bites. ECDC is continuing to monitor the situation in collaboration with the national and regional (Madeira) public health authorities while gathering information on confirmed cases reported by EU/EEA Member States.

Anthrax in intravenous drug users

Between June and 31 December 2012, 13 confirmed cases of anthrax among people who inject drugs (PWID), including five fatalities, were reported in four EU countries: Germany (four cases, one fatal), Denmark (two cases, one fatal), France (one case) and United Kingdom (six cases, three fatal)[15-21].

Results from molecular typing indicated that the outbreak was probably linked to the 2009–2010 outbreak of anthrax among PWID: of seven *B. anthracis* isolates tested, two isolates from the United Kingdom were indistinguishable from the 2009–2010 strain, while three isolates from Germany and two from Denmark were identical or almost identical to the 2009–2010 strain.

During the 2009–2010 outbreak, 124 cases in the United Kingdom (England five, Scotland 119) and three cases in Germany (one unconfirmed) were reported[22-24].

The clinical presentation of (atypical) anthrax through injection is characterised by serious soft tissue infection (SSTI), coupled with extensive oedema, usually presenting several days after heroin injection. Some cases presented with signs of systemic infection, including fever, raised white cell count and cardiovascular compromise[23]. The source is presumed to be heroin contaminated with *B. anthracis*[23,25].

ECDC and the European Drug Monitoring Agency, EMCDDA are currently developing evidence-based guidance on the prevention of anthrax in PWID. This work is supported by a panel of external experts (public health, harm reduction, clinical management, microbiology, and law enforcement).

Potential contamination of an organ perfusion solution

On 30 March 2012, a pharmaceutical company issued a voluntary precautionary recall of all batches of an organ perfusion solution, produced since 4 July 2011, following reports of potential contamination with *Bacillus cereus*. The solution is used for the preservation of organs prior to transplantation and was widely distributed to a number of countries around the world. *Bacillus cereus*, a germ commonly found in the environment, was isolated from an aseptic process simulation (known as 'media fill'), which is performed every six to eight months in the production plant to test sterility. *Bacillus cereus* was never isolated from batches of the perfusion solution itself[26]. An initial ECDC rapid risk assessment dated 3 April 2012 recommended that patients who had already undergone transplantation with organs or tissues kept in the perfusion solution after July 2011 needed to be monitored for early detection of the signs and symptoms of infection, and clinicians and laboratories needed to be alerted about the potential risk.

No cases of *B. cereus* infection in transplanted patients have been reported to date.

Fungal endophthalmitis

On 20 April 2012, CDC informed ECDC about an investigation that was undertaken in relation to a cluster of 33 cases of fungal endophthalmitis reported from seven states in the USA. The cluster was linked to two types of products sold by a compounding pharmacy – a dye, which is used during retinal surgery and was linked to 21 cases (*Fusarium spp.* was cultured), and triamcinolone-containing products, which are used as intra-vitreal injections and were linked to 12 cases (*Bipolaris spp.* was cultured). The US Food and Drug Administration issued a recall of the dye on 19 March 2012[27] and updated the recall on 20 April 2012[28], including information on triamcinolone-containing products sold by this pharmacy. No case was reported to ECDC following this event.

Mass gathering events – European football championship 2012 in Poland and Ukraine, London 2012 Olympic and Paralympic Games in the United Kingdom

UEFA European Championship EURO 2012, Poland and Ukraine

The final stage of the EURO 2012 soccer tournament took place from 8 June to 1 July in Poland and Ukraine. The event attracted more than a million fans to Ukraine alone.

A rapid risk assessment of the measles situation in Ukraine due to an ongoing outbreak was posted on ECDC's website on 14 March 2012 and emphasised the importance of having the relevant vaccinations such as measles up-to-date when planning to attend mass gatherings.

No associated major outbreaks or public health incidents occurred during the football championship. Isolated cases of gastroenteritis and vaccine-preventable diseases were reported by national authorities, as would be normally expected for the season.

London 2012 Olympic and Paralympic Games, United Kingdom

From 27 July–12 August and 29 August–9 September, the 2012 Olympic and Paralympic games were hosted by London, with the Games being held at sites throughout the United Kingdom and large numbers of visitors attending from all over the world.

No associated major outbreaks or public health incidents occurred during the Games. None of the international infectious disease incidents identified and considered during the surveillance period were rated as potential threats to the Games.

Adverse events after BCG vaccination

Following intense media interest in the safety of the BCG-SSI vaccine (Statens Serum Institut, Denmark) and an increase in reports of enlarged lymph nodes/lymphadenitis in children after vaccination in the previous year, the Romanian Minister of Health decided to temporarily suspend the national BCG vaccination programme on 20 November 2012.

This was a precautionary measure, followed by a request for a rapid and objective risk assessment of the Romanian BCG vaccination programme by external experts. A joint WHO EURO-ECDC mission was organised. The reporting rate was around 1 per 1 000 vaccine recipients, being in the upper range of expected local lymphadenitis after BCG vaccination. No clustering of cases suggestive of a systematic programme error (e.g. related to a vaccinator or a district) was observed.

The main conclusion from the assessment was that the BCG-SSI vaccine is safe and the frequency of reported AEFI was in line with the BCG vaccine safety profile. In late November 2012, WHO and ECDC recommended the immediate resumption of the BCG vaccination programme against tuberculosis in Romania.

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Annex

Annex. List of communicable diseases for EU surveillance

Annex I of Commission Decision 2000/96/EC of 22 December 1999 on the communicable diseases to be progressively covered by the Community network under Decision No 2119/98/EC of the European Parliament and of the Council, as amended by Decisions 2003/534/EC, 2003/542/EC, 2007/875/EC, 2009/312/EC, 2009/539/EC and 2012/492/EU.

1 Communicable diseases and special health issues to be progressively covered by the community network as referred to in Article 1 [of Decision 2000/96/EC]

1.1 For the communicable diseases and special health issues listed in this Annex, epidemiological surveillance within the Community network is to be performed by the standardised collection and analysis of data in a way that is to be determined for each communicable disease and special health issue when specific surveillance networks are put in place.

2 Diseases

2.1 Diseases preventable by vaccination

Diphtheria
Infections with *haemophilus influenza* group B
Influenza – including influenza A(H1N1)
Measles
Mumps
Pertussis
Poliomyelitis
Rubella
Smallpox
Tetanus

2.2 Sexually transmitted diseases

Chlamydia infections
Gonococcal infections
HIV infection
Syphilis

2.3 Viral hepatitis

Hepatitis A
Hepatitis B
Hepatitis C

2.4 Food- and waterborne diseases and diseases of environmental origin

Anthrax
Botulism
Campylobacteriosis
Cryptosporidiosis
Giardiasis
Infection with enterohaemorrhagic *E.coli*
Leptospirosis
Listeriosis
Salmonellosis
Shigellosis
Toxoplasmosis
Trichinosis
Yersinosis

2.5 Other diseases

2.5.1 Diseases transmitted by non-conventional agents

Transmissible spongiform encephalopathies
Variant Creutzfeldt–Jakob's disease

2.5.2 Airborne diseases

Legionellosis
Meningococcal disease
Pneumococcal infections
Tuberculosis
Severe Acute Respiratory Syndrome (SARS)

2.5.3 Zoonoses (other than those listed in 2.4)

Brucellosis
Echinococcosis
Rabies
Q fever
Tularaemia
Avian influenza in humans
West Nile virus infection

2.5.4 Serious imported diseases

Cholera
Malaria
Plague
Viral haemorrhagic fevers

2.5.5 Vector-borne diseases

Tick-borne encephalitis

3 Special health issues

3.1 Nosocomial infections

3.2 Antimicrobial resistance

TQ-AC-14-001-EN-C

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Publications Office

ISBN: 978-92-9193-543-7