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**TECHNICAL** REPORT

# Health inequalities, the financial crisis, and infectious disease in Europe

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# Contents

# Abbreviations

| | |
|---|---|
| EU/EEA | European Union/European Economic Area |
| GDP | Gross Domestic Product |
| PWID | People who inject drugs |
| OECD | Organisation for Economic Cooperation and Development |
| STI | Sexually transmitted infection |
| TB | Tuberculosis |

# Foreword

Social inequalities in Europe, both between and within Member States, can have serious consequences for health. Health inequalities among socially disadvantaged and advantaged EU citizens are at odds with the EU principles of solidarity, fairness, and equal opportunity for all. In 2009, the Commission of the European Communities recognised the need to act on these inequalities and described specific steps to be taken in the communication entitled: 'Solidarity in Health: Reducing Health Inequalities in the EU' [1]. The Commission proposed to advance the understanding of what interventions work best to reduce health inequalities and how to translate these insights into practice, to monitor the status of health inequalities and to improve the knowledge of successful strategies to reduce them. In accordance with this communication, the European Centre for Disease Prevention and Control (ECDC) has prioritised work on health inequalities in relation to infectious disease. There are systematic and avoidable differences in infectious diseases between social groups that differ by variables such as income, education, occupation, etc. Poor and more disadvantaged individuals tend to suffer from a higher disease burden and are more likely to experience illness and disability as a result.

The economic recession that started in late 2007 resulted in budgetary constraints for many governments and has also adversely impacted many individuals, particularly members of vulnerable groups, such as the Roma, migrants, and unemployed youth. ECDC is committed to address these challenges and aims to find evidence-based strategies and best practices that can be enacted by Member States to measure and ameliorate health inequalities in their countries. Such insights are particularly important during times of economic duress; they can potentially help minimise adverse health outcomes from budget cuts and the discontinuation of public health programs. This report summarises some of the work done by ECDC in this field and describes on-going and planned work in this area. Certainly, measuring and tackling health inequalities in relation to infectious disease is no small task – but it is essential if we are to meet the European principles of social solidarity and aspirations for population health.

Marc Sprenger

Director

# Introduction

According to its founding Regulation, ECDC's mission is to identify, assess and communicate current and emerging threats to human health posed by infectious diseases [2]. During 2012 and 2013, in recognition of widening health inequalities and the challenges faced by Members States brought about by the economic crisis, ECDC placed strategic emphasis on addressing health inequalities as related to infectious disease prevention and control in Europe.

This report summarises the importance of addressing health inequalities by identifying key areas for attention from health professionals and policy makers. It presents key findings from previous ECDC meetings and activities, alongside other important studies, which collectively make a convincing case that socio-economic determinants have a substantial impact on infectious disease control in Europe. Based on these findings, this report then outlines the ECDC strategy for addressing health inequalities in the coming years.

# 1. Background

## 1.1. Health equality: a European priority

Health is a fundamental universal right. In Europe, the 1992 Maastricht Treaty guarantees social protection, fights against social exclusion, and protects human health, and Article 129 of this Treaty includes Public Health as an activity area at the EU level. The Lisbon Treaty (the Charter of Fundamental Rights of the EU), meanwhile, establishes that everyone has the right of access to preventative healthcare [3].

Social stratification exacerbates ill health. Differences in income, education and social status lead to differing living and working conditions which, in turn, result in certain exposures that can impair health. In recent years, however, it has been observed that health inequalities continue to persist within EU Member States. To further prioritise this issue, the European Commission issued a Communication on 'Solidarity in Health: Reducing Health Inequalities in the EU' in 2009 suggesting, among other activities: assessing the impact of EU policies on health inequalities; collecting data on the size of inequalities in the EU; meeting the needs of vulnerable groups; and reviewing successful strategies aimed at reducing them. Similarly, the European Parliament adopted the resolution 'Reducing health inequalities in the EU' (2011) to highlight the need to improve data and knowledge (including measuring, monitoring, evaluation, and reporting), to build support for reducing health inequalities, and to act promptly to meet the needs of vulnerable groups.

It is not simply health inequalities, but also specific vulnerable groups that have become focal points for activity. Targeted EU-initiatives have also focused upon children, Roma, and migrants, as well as other vulnerable groups. In 2011, for example, the Commission developed 'An EU Framework for National Roma Integration Strategies up to 2020' [4]. Healthcare is one of four key integration goals in this strategy.

The issue of migration and its implications for public health, meanwhile, was put on the European agenda during the Portuguese Presidency of the Council of the EU in 2007. The conference 'Health and migration in the EU: Better health for all in an inclusive society', in Lisbon in June 2007, led to Council Conclusions on Health and Migration in the EU, adopted by the Council of the EU in December 2007, which highlighted the link between the health of migrants and that of all EU citizens [5]. The Council Conclusion recommended that the European Commission support action through the Programme of Community Action in the Field of Health 2008–2013 and invited Member States to integrate migrant health into national policies and to facilitate access to healthcare for migrants. The Conclusion also called on ECDC to produce a comprehensive report on migration and infectious diseases in the EU, focusing on tuberculosis (TB), HIV and vaccine-preventable diseases, in order to inform policy and public health responses.

Moving forward, the European Commission growth strategy for 2020 discusses directions towards inclusive growth highlighting issues of social inclusion, workforce capacities, reducing loss to labour market from death, disease and disability and moving towards smart growth where health is seen as wealth [6]. Building upon past activities in the area of health inequalities[i] [7] and consistent with the Commission's growth strategy, the Directorate General for Health and Consumers proposed the EU Health Strategy for 2014–2020, 'Health for Growth', which highlights the importance of targeting key health determinants as well as preparing for cross-border health threats [8]. In addition, the Commission's Investing in Health Strategy focuses on health inequalities[ii]. However, in light of the

[i] For more information see the EC Directorate-General for Health and Consumer's website where information on projects from 2003 till 2009 can be retrieved - http://ec.europa.eu/health/projects/hd/index_en.htm

[ii] European Commission. Towards social investment for growth and cohesion - including implementing the European Social Fund 2014-2020. Available at: http://ec.europa.eu/health/strategy/docs/swd_investing_in_health.pdf

continuing economic difficulties in some European countries, health inequalities can be seen in the context of government budget shortfalls and potential public health program cuts.

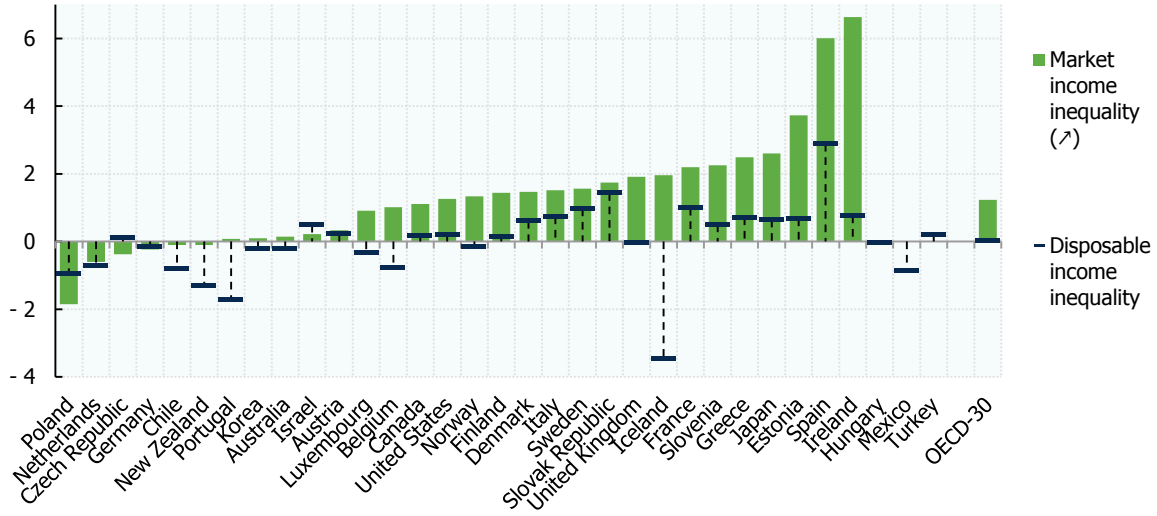
## 1.2. Health inequalities, infectious disease, and the financial crisis in Europe

The financial crisis in Europe started in late 2007 and continues to influence many of the key social determinants of health in Europe, both through changes to living conditions and to public spending.

Even before the current financial crisis, it had been noted that a social gradient in health existed both globally and throughout the EU, through which lower life expectancies and poorer health were associated with lower socioeconomic status and/or lower education [9, 10]. The financial crisis substantially lowered economic growth rates in the EU and drove up unemployment rates. In some cases, these changes were drastic. As has been reported elsewhere, Eurostat data demonstrate that the mean EU decrease in GDP in 2009 was 4.5%, with the worst individual case was 17.7% in Latvia [11]. Although GDP growth rates started to rebound in 2010 and 2011, the mean EU GDP rate decreased again in 2012 by 0.4% [12]. Meanwhile, unemployment increased dramatically in 2008, with examples including 9% in Ireland, 12% in Spain and Estonia, 13% in Latvia and 14% in Lithuania [11].

With lower economic growth and higher unemployment, it is unsurprising that the financial crisis appears to have increased income inequality in many countries (Figure 1, 2). In 2013, the Organisation for Economic Cooperation and Development (OECD) noted that the number of people living in poverty increased in most OECD countries between 2007 and 2010. Moreover, as the OECD notes, 'income inequality increased by more in the first three years of the crisis to the end of 2010 than it had in the previous twelve years [13]. Such numbers demonstrate that the need to pay attention to social inequalities, and the disparate health outcomes that they lead to, is greater today than it has been in many years.

**Figure 1. Percentage point changes in the Gini coefficient of household market and disposable incomes in OECD countries between 2007–2010.**



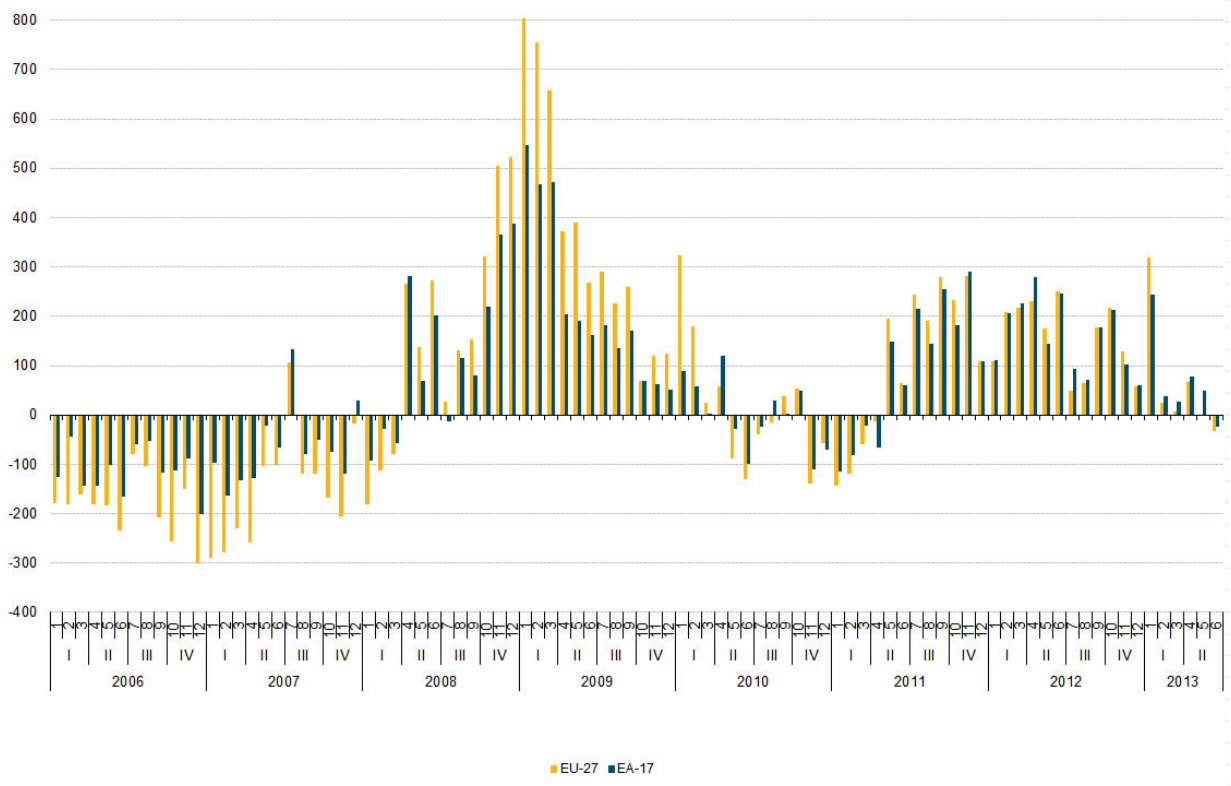

*Source: OECD (2013), 'Crisis squeezes income and puts pressure on inequality and poverty'*

*Note; The Gini coefficient is a measure of the income distribution of a country, where 0 represents complete equality and 1 represents complete inequality.*

There is accumulating evidence that the financial crisis is impacting the spread of infectious disease and Member States ability to prevent or respond to infectious diseases. In 2009, ECDC launched a project aimed at assessing the potential impact of this crisis. A systematic literature review found examples of changes in disease transmission patterns and treatment availability in times of economic hardship [14]. In addition, public health experts were surveyed for their thoughts on possible effects of the crisis on preventive and disease control programs [15]. Services for vulnerable and hard-to-reach groups were reported to be particularly at-risk. Respondents also reported that governments were likely to cut public spending which would lead to less investment in health services.

Some of these predictions have already come true. In the last five years in many EU countries public spending had been reduced, affecting resource allocation for public health prevention [16]. Meanwhile, a large outbreak of HIV among people who inject drugs (PWID) that began in Athens in 2011 has been linked, anecdotally, to the financial crisis, increased unemployment and increased injecting drug use [17]

**Figure 2. Change in the number of unemployed persons in OECD countries (compared to previous month, in thousands), seasonally adjusted, January 2006–May 2013.**




*Source: Eurostat 2013. Change in the number of unemployed persons (compared to previous month, in thousands), seasonally adjusted, January 2006 - June 2013- Statistics explained (2013/9/3).*

In sum, health inequalities are present within the EU/EEA, they exist across a social gradient [18], and recent evidence, as noted above, suggests that the financial crisis has widened inequalities in many EU Member States. A pertinent question that can be asked is to what extent are health inequalities important for infectious disease prevention and control?

A systematic literature review conducted by ECDC has revealed that health inequalities for various infectious diseases can be identified in each EU Member State [19]. ECDC has also demonstrated strong associations between income inequalities and rates of tuberculosis [20, 21]. This evidence, although incomplete, will be further discussed in sections 2 and 3, for it informs the ECDC strategy on health inequalities (section 4).

The financial crisis has and continues to influence many of the key social determinants of health in Europe, both through changes to living conditions and to public spending. It remains to be seen whether long-term effects of the financial crisis will continue to impact infectious diseases in Europe, but history suggests that identifying key social determinants, addressing health inequalities, and engaging vulnerable groups are and will be important activities for European public health in the coming years.

# 2. Social determinants and infectious diseases in Europe

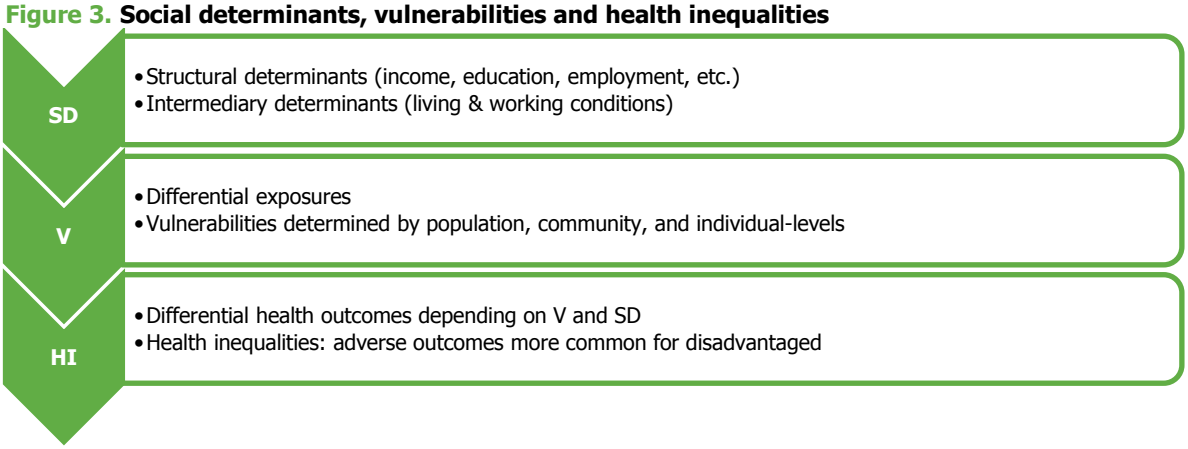
## 2.1 Structural, intermediary and individual determinants

Infectious diseases, like many other health issues, can be seen as both an indicator and product of the structure of a society. In Europe, the most recent centuries and decades have yielded substantial improvements in nutrition, housing, and basic hygiene, including cleaner water and better food handling that have helped to curtail many of the infectious diseases that once plagued Europe. Yet those who live and work in suboptimal conditions or lack, for whatever reason, adequate access to healthcare, may not fully benefit from these societal advances.

One way of viewing health inequalities is to consider the structural, and intermediary factors (determinants) that affect health (Figure 3). Structural issues refer to those that might be expected to affect large swathes of society, such as national levels of wealth (often measured as GDP per capita), the distribution of income, levels of higher education or employment rates. These structural factors influence the extent to which social inequalities, and thus health inequalities, persist. Other examples of structural determinants could include the equitable or inequitable distribution of societal benefits among minority groups, which might determine the extent to which these groups are particularly vulnerable to specific disease outcomes. Slightly more proximal to individuals, intermediary determinants, such as safety standards for housing and at work, affect people's lifestyles, exposures to disease, and overall well-being.

Structural and intermediary may overlap, creating situations in which some groups might face multiple vulnerabilities. Thus wider social and public contexts (societal wealth and its distribution, socioeconomic stratification, welfare policies, housing, healthcare organisation, etc.) influence the health status of individuals and of populations.

**Figure 3. Social determinants, vulnerabilities and health inequalities**




To demonstrate the multifaceted and complex ways in which the various structural, and intermediary determinants affect vulnerability to infectious disease, consider the examples from Table 1. A surprisingly wide range of infectious diseases, and different vulnerable groups, collectively demonstrate that in each and every EU/EEA Member State, health inequalities related to infectious disease can be identified. The examples are many, including lower vaccination coverage among socially deprived families; a strong correlation between syphilis and unemployment; higher incidence of disease among immigrants; or socioeconomic deprivation as a risk factor for meningococcal disease.

In order to elaborate upon some of the determinants discussed here, the following sections, will provide a few concrete examples of the ways in which specific social determinants have been shown to affect infectious disease rates in Europe. Those that are discussed at length are by no means meant to be viewed of as exhaustive, but rather as illustrative examples.

**Table 1. Selected examples of infectious diseases impacted by social determinants in Europe, 1999–2010 (adapted from Semenza JC 2010)**

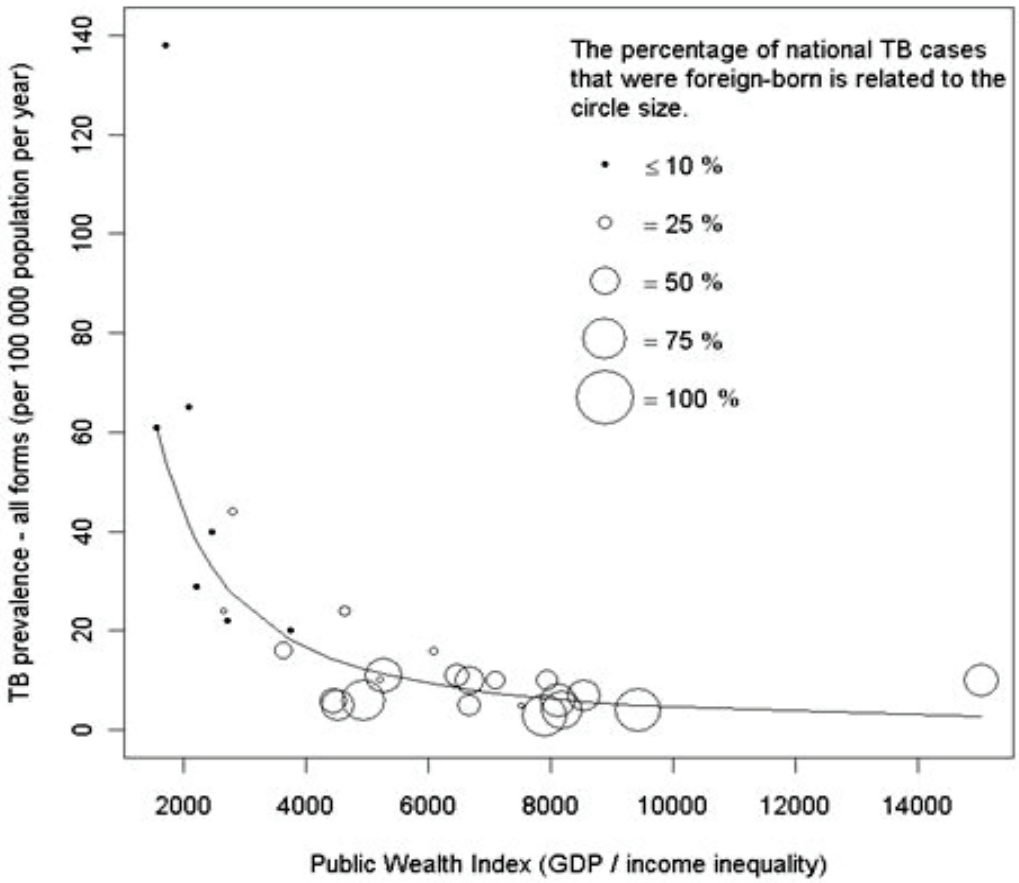
| Infection | Health endpoint | Social determinants and site of study | Ref |
|---|---|---|---|
| Campylobacter | Intestinal disease | Pakistani community at greater risk of infection than White community in England. | [22] |
| Clostridium botulinum | Progessive bulbar palsy, diplopia, dysarthria, and a positive electromyography (EMG) test | Injecting heroin drug users at risk, Dublin, Ireland. | [23] |
| Common childhood pathogens | Infectious/parasitic diseases | High infection rates found in children in a lower socioeconomic area in Romania (Moldova) | [24] |
| Cytomegalovirus (CMV) | infectious mononucleosis, with fever, and mild hepatitis; congenital abnormalities | Low socioeconomic status and social environment risk factor for CMV seroprevalence and congenital CMV infection in Helsinki, Finland. | [25] |
| Bacillus anthracis | Inflammation or abscesses related to sites of heroin injection; death | Outbreak among (predominantly) people who inject drugs in Scotland | [26] |
| Drug-related infections and co-infections | Number of major health consequences | Marginalised (Roma or homeless) people who inject drugs suffer risks from injecting and sexual behavior risks, as well as from poor hygienic living and injecting conditions in Budapest, Hungary | [27] |
| Flaviviridae (Arbovirus) transmitted by ticks | Tick-borne encephalitis (TBE) | Socio-economic factors influence transmission of TBE in Central and Eastern European countries. | [28] |
| Herpes simplex virus type 1 (HSV1) and 2 (HSV2) | Significant morbidity, and HSV2 is considered a risk factor for HIV transmission | HSV1 seroprevalence increase with age among people of Turkish and Moroccan origin, men who have sex with men, and individuals with low educational level in Amsterdam, Netherlands. | [29] |
| Neisseria meningitidis (meningococcus) | Meningococcal disease | Parental smoking and unfavorable socioeconomic circumstances among children in the Czech Republic. | [30] |
| Rubella | Terminations and congenital rubella syndrome (CRS) | Low socioeconomic status associated with low rubella seropositivity in Dogankent Health Center, in Turkey. | [31] |
| Hepatitis A | Acute infectious disease of the liver | Outbreak in Lomnička, a village in the eastern part of Slovakia among the Roma population associated with low socio-economic conditions. | [32] |
| Hepatitis B | Malignant and non-malignant liver disease | Immigrant women in Greece significant higher prevalence. | [33] |
| Influenza | Vaccine coverage | Lower vaccine uptake in socio-economically deprived populations in Britain. | [34] |
| Methicillin-resistant Staphylococcus aureus (MRSA) | Postoperative infection | Patients from the most deprived areas at higher infection risk than those from the least deprived areas in England. | [35] |
| Neisseria meningitidis | Meningitis | Association with area deprivation of socio-economic environment in England. | [36] |
| Sexually transmitted diseases (STI) | STI | High-risk sexual behavior among immigrant groups in Amsterdam. | [37] |
| Toxoplasmosis | Encephalitis and congenital malformations | Migrants in Northern Italy not correctly monitored for toxoplasmosis during pregnancy, which precludes timely application of preventive measures. | [38] |
| Puumala virus (PUUV) | Nephropathia epidemica, a mild form of hemorrhagic fever with renal syndrome (HFRS) | PUUV infection risk higher among low-income populations in remote forest areas, where level of urbanization is low in Belgium. | [39] |

### 2.1.1 Wealth and its distribution

It is widely acknowledged that the overall wealth of a society affects population health, and research also demonstrates that countries with redistributive policies that reduce social inequalities tend to have better overall population health [40]. The lesson is simple: with fewer social inequalities, health inequalities are fewer and thus overall population health is better.

This relationship appears to hold true for at least some infectious diseases in Europe. Although analytical power is weakened when analysing ecological relationships, one ECDC study, for example, has demonstrated that a measure of wealth and its distribution (the public wealth index) was strongly associated with national prevalence of tuberculosis (Figure 4) [21]. The implication is that traditional diseases associated with poverty, such as tuberculosis, stand much less chance of thriving if living standards for everyone within a country are of a relatively high standard [20].

**Figure 4. Public wealth index and tuberculosis prevalence rates in the 27 European Union member states plus Norway and Iceland, 2006. [21]**

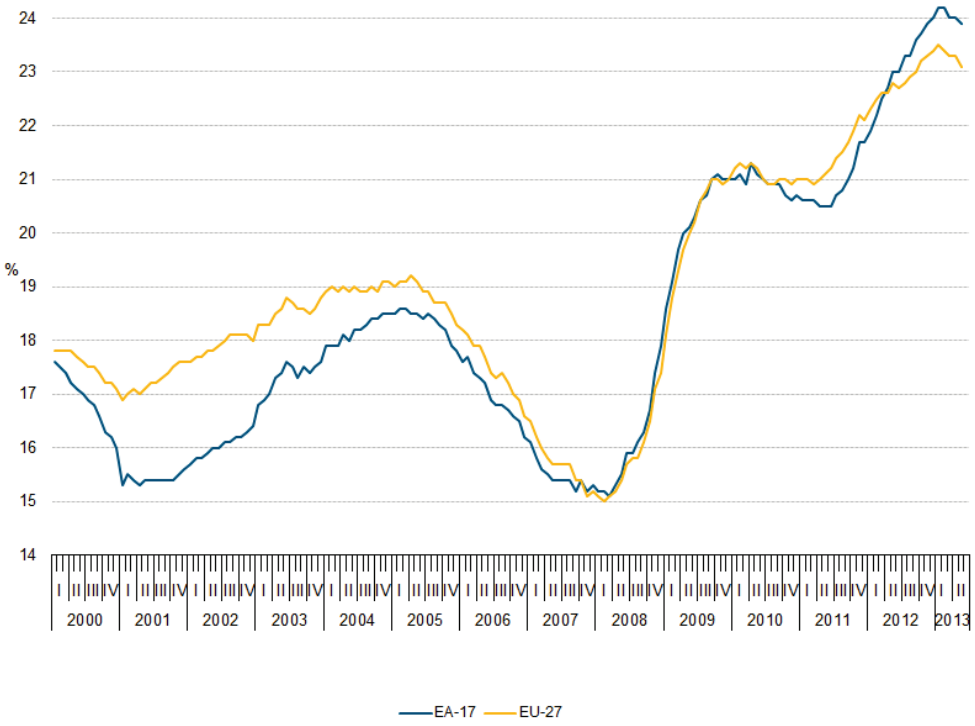



*GDP, gross domestic product. Circles represent the proportion of cases in country that are foreign-born.*

## 2.1.2 Unemployment (youth)

Poverty and illness are nearly inseparable: the combination of both low economic and social capital leads to poor health [41]. In the EU, almost 81 million citizens live in monetary poverty. Material deprivation and a lack of employment prospects or opportunities are important dimensions in poverty [42]. Unemployment for example, unemployment might increase stress which in turn affects health vulnerabilities, while material deprivation can lead to malnutrition and unmet medical needs. Unemployment may furthermore increase risky behaviour (smoking, alcohol, drug use, etc) which could affect exposure to infectious disease [43, 44].

**Figure 5. Youth unemployment rates, EU-27 and EA-17, seasonally adjusted, January 2000-May 2013 (%).**




*Source: Eurostat.*

Youth unemployment has become a particularly important issue, as rates have increased substantially in recent years. On-going work at ECDC has identified associations between youth unemployment and lower immunisation rates, as well as between youth unemployment and increases in cases of HIV, other STIs, and respiratory diseases. In addition, an analysis of morbidity and mortality due to infectious diseases among young people in eight countries across Europe (Austria, Spain, France, Netherlands, Lithuania, Estonia, Hungary, and UK) suggests a link with youth unemployment.

## 2.1.3 Education

Education is a key indicator of socioeconomic status. The relationship is bi-directional: higher education leads to better health, while better health leads to higher education. For example, good health in childhood enhances cognitive functions and reduces school absenteeism and early drop-out rates [45] [46], and as such children with better health can be expected to attain higher educational levels and therefore be more productive in the future. Conversely, ill-health in the population is related to the fact that not everybody has a high level of education, a higher occupational class, or a high income level [47] [48].

As concerns infectious disease, a study from the Region of Madrid, for example, demonstrated that mortality from infections among individuals with elementary or less education was higher than that of men and women with tertiary level education [49].

Parents' education levels, meanwhile, affect not only their own health outcomes but also those of their children. Maternal educational attainment has been shown to be associated with positive health outcomes of children as a consequence of better health, literacy, and utilisation of health services due to access and information about preventive measures (such as vaccination) [50–52]. In light of this knowledge, ECDC examined the determinants of co-morbidities from a measles infection during the outbreak in 2009 and 2010 in Bulgaria. It was found that maternal education was protective against co-morbidities from measles, with an odds ratio of 0.83 (95% CI: 0.73–0.94). For each successive year of education the probability of co-morbidities decreased by 17%, all other factors being equal [53].

### 2.1.4 Living environment and urbanisation

The number of Europeans living in cities is increasing, and this can create challenges for public health [54] [55]. According to United Nations forecasts, by 2050 some 83% of the European population is expected to live in cities. [56] Infectious diseases are a threat in many cities due to higher population densities, overcrowding, polluted environment, intensive international travel and commerce [57]. While it has been documented that individuals living in affluent areas have higher levels of self-reported health, populations living in deprived areas are more susceptible to tuberculosis, hepatitis, dengue, pneumonia, cholera and diarrhoeal diseases, which spread easily in highly concentrated populations [58].

Studies have linked the social deterioration (e.g. expressed by a "broken windows" index measuring housing quality, abandoned cars, graffiti, trash, and public school deterioration) with infectious diseases (e.g. gonorrhoea, HIV, TB) [59] [60]. Sexually transmitted infections (STI) and Tuberculosis (TB) have been highlighted as persistent infectious diseases in urban environments [61–63]. Variation in the levels of TB incidence in neighbourhoods in Naples, Italy, for example, was explained by neighbourhood deprivation to a greater extent than it was by immigration [64. An ECDC study explored the relationship between neighbourhood deprivation and rates of sexually transmitted diseases (STI) and tuberculosis (TB) in London, United Kingdom. It was found that TB rates were higher in boroughs that had higher levels of income deprivation. The rates of various STI were also higher in boroughs with higher levels of 'living environment' deprivation.

## 2.2 Multiple determinants

Individuals are seldom subject to one key health determinant, but often multiple health determinants interact to affect health outcomes. Infections do not simply arise because an individual has been exposed to an infectious agent, but because they are subject to myriad structural, intermediary and individual-level determinants that conspire collectively, to create the conditions in which they are more likely to be infected and less likely to be able to cope with infections. Thus, vulnerable or marginalised groups carry a disproportionately large part of the infectious disease burden [65] [66]. In order to demonstrate how multiple determinants interact, three vignettes are presented below, and in section 3, further details on the multiple determinants facing specific vulnerable groups, namely migrants (3.1) and Roma (3.2) will be explored.

### 2.2.1 HIV

High stigma has been associated with HIV since the beginning of the HIV epidemic, largely due to its association with marginalised and vulnerable populations. Most countries in the EU/EEA have low-level HIV epidemics, where most cases are concentrated among key populations. Cumulatively, over 420 000 HIV cases have been reported in the EU/EEA and in 2011, about 28 000 HIV infections were reported. Most HIV cases reported in 2011 were concentrated among socially marginalised groups such as men who have sex with men (39% of HIV cases reported), migrants from countries with generalised HIV epidemics (13%), and people who inject drugs (5%) [67].

Although HIV prevention measures such as condoms, needle and syringe programmes, and prevention of mother-to-child transmission programmes are evidence-based and cost-effective to implement, many members of these populations at highest risk for HIV do not have access to such prevention measures due to policies which provide them being at an insufficient scale or failing to provide such services at all. In 2011, outbreaks of HIV among people who inject drugs were reported in Greece and Romania; and these were associated with low or reduced levels of preventive intervention funding [17]. On the individual level, heavy stigma associated with accessing services or low self-efficacy associated with the stigma of HIV sometimes act as barriers to prevention service access. On the structural level, some key population groups, such as undocumented migrants, do not have access to HIV testing or treatment.

### 2.2.2 Tuberculosis

Tuberculosis (TB) accumulates among the socially and economically disadvantaged. A great reduction in TB burden was achieved in many EU Member States during the 20th century. This led to a situation where TB is often perceived as a disease of the past and health systems put less priority on preventing and controlling it.

In 2011, about 25% of all reported TB cases in EU/EEA were of foreign origin [68, 69]. Other important vulnerable groups include the homeless, alcoholics, people who inject drugs, HIV-seropositive persons, prisoners and other socially and economically disadvantaged individuals, especially those in congregated urban settings. These groups are at increased risk of getting exposed to TB infection and can also be at increased risk of progressing from infection to TB disease. These vulnerable and excluded groups carry the most significant burden of disease and are often the ones with the poorest access to health services. Many of these vulnerable groups gather in metropolitan settings, resulting in an urban TB incidence that is 3–7 times higher than in rural areas of countries with an otherwise low incidence of TB. The prevention and control of TB among these hard-to-reach risk groups is complicated by delayed diagnosis, and onward transmission. In particular, alcohol abuse and illicit drug use are often major obstacles for improving treatment outcomes and are strongly associated with poor treatment adherence [70].

### 2.2.3 Vaccine-preventable diseases

In the EU, vast inequalities can be observed in relation to vaccination. Introduction of new vaccines (pneumococcal, human papilloma virus, varicella, rotavirus) is a clear two-speed process, from north-western countries to central-eastern Europe. Budgetary issues, the result of health reforms and economic crises, may represent an obstacle to the introduction of new vaccines in some national immunisation schedules. Moreover, recent large outbreaks (e.g. measles in Bulgaria) have demonstrated that large population groups have had poor access to vaccination and healthcare systems in general [71].

On the other hand and ironically, in countries where few structural barriers to vaccination exist, it is also evident that a large part of the population, represented by young parents of high socio-economic status, are prone to resist vaccinating their children [72]. This is part of the so-called 'vaccine paradox', through which vaccines are a victim of their own success and are no longer seen as a priority by generations of parents that – because of vaccination – have never experienced the tragedy of vaccine-preventable diseases such as smallpox, polio or diphtheria.

Improving vaccination coverage is a strong priority for public health, especially in view of measles and rubella elimination targets. In order to reach public health goals, analysing social determinants is a priority in order to better develop tailored interventions such as supplementary vaccination activities or communication campaigns.

# 3. Highly vulnerable populations in Europe

Certain population segments may suffer higher vulnerabilities and risk exposures related to infectious disease. These groups are likely to be subject to multiple social determinants detrimental to their health. Such groups could include prison populations, children, the homeless, unemployed people, people who inject drugs, and some migrant populations, Roma populations, etc. In recent years, ECDC has paid particular attention to migrant health and to Roma populations. Factors leading to increased vulnerability of these groups are complex; however, it is clear that health outcomes for these groups have been worse compared to average levels of the general EU population.

## 3.1 Migrants

Migration flows to and within Europe have an increasing effect on demographic change in European societies. In 2011 there were 48.9 million foreign-born residents in the 27 countries of the European Union (EU), amounting to 9.7% of the total population [73]; 32.4 million were born outside the EU, with 16.5 million born in a different EU Member State [74]. The increasing diversity of the European population, combined with the complex, long-term nature of migrant integration is creating new challenges for health systems, which need to adapt to accommodate disparate health needs [75].

Migration into and within Europe has important implications for public health. While migrants are often comparatively healthy - a phenomenon known as the 'healthy migrant effect' [76], they often face particular health challenges and are vulnerable to a number of threats to their physical and mental health. There is strong evidence to show that that migrants and ethnic minorities in EU countries have a different prevalence of infectious diseases due to a range of structural determinants such as unequal access to preventive, diagnostic and treatment health services in host communities. It is also important to recognise that the determinants that propagate the dissemination and upsurge of infectious diseases are not necessarily just population movement but rather the conditions under which migrants move and live when they have arrived at their new destination country.

In a 2006 Lancet publication it was stated that the most important health issue facing migrants is increased vulnerability to infectious diseases [77]. Regrettably, there is a lack of comprehensive information on migration and infectious diseases in most EU countries, but available data suggest that migrant populations from countries with a high prevalence of infectious diseases are disproportionately affected by HIV, STI, TB, hepatitis B and C, enteric fevers, Chagas disease, etc.

Thus far, most ECDC output on migrant health has centred on HIV/AIDS in relation to migration, but projects on TB have also been conducted [78–80]. The first component consists of a Background Note on migration and infectious diseases[i]. The second component consists of three disease specific areas where ECDC is working to produce scientific reports in the areas of HIV, TB and vaccine-preventable disease.

## 3.2 Roma

The term Roma encapsulates a large variety of populations. Roma communities are marked by vast linguistic, cultural, social, and religious differences both within and among countries. While not all persons labelled by non-Roma as Roma would identify as such, and that not all Roma are marginalised, as a group, the Roma in Europe are disproportionately poor, and are more likely to experience ill health.

With an estimated 10-12 million people [81], Roma communities represent the largest ethnic minority in Europe today, and the one that is highly marginalised in all aspects of everyday life. Often Roma lack identification papers, have low education attendance and high illiteracy, and have a migratory lifestyle. In addition, Roma often lack access to or do not use preventative healthcare. The inequality in accessing health services is linked to a lack of targeted information campaigns, limited access to quality healthcare and exposure to higher health risks. In a survey conducted by the EU Fundamental Rights Agency, discrimination by healthcare personnel also emerged as a particular problem for the Roma [82] with 17% indicating they had experienced discrimination in this area in the previous 12 months. Use of prevention services among the Roma population is low and, according to some studies, over 25% [83] of Roma children are not fully vaccinated, thus being at higher risk of acquiring vaccine-preventable diseases.

[i] The Background Note is a result of a technical expert meeting which was hosted by ECDC in 2008, and was developed to provide an overview of migration and infectious diseases in the EU.
http://www.ecdc.europa.eu/en/publications/publications/0907_ter_migrant_health_background_note.pdf

Roma experience ill health in part because they are much more likely to be poor. Data show that Roma have lower socio-economic status, and diseases such as TB, measles, and hepatitis disproportionately affect the lowest socio-economic strata [84–86]. Roma are also likely to be sicker than other poor people with the same income level. The few studies that have been conducted assessing both health and poverty among the Roma confirm this assertion [87–89]. Therefore, attributing health inequities only to poverty is misleading; experiences such as discrimination and culturally incompetent care likely exacerbate the impact of poverty on health among the Roma.

# 4. Conclusion: addressing health inequalities and infectious disease in Europe.

As the findings from sections 2 and 3 have demonstrated, health inequalities continue to exist in the EU, manifested through the interaction of structural and intermediary determinants, such as wealth distribution, education, urbanisation. There is ample evidence to demonstrate that health inequalities play a strong, but often underappreciated role in infectious disease transmission. In particular, groups subject to multiple social determinants of health, including some migrant and Roma populations, may be particularly vulnerable to infectious disease and warrant special attention.

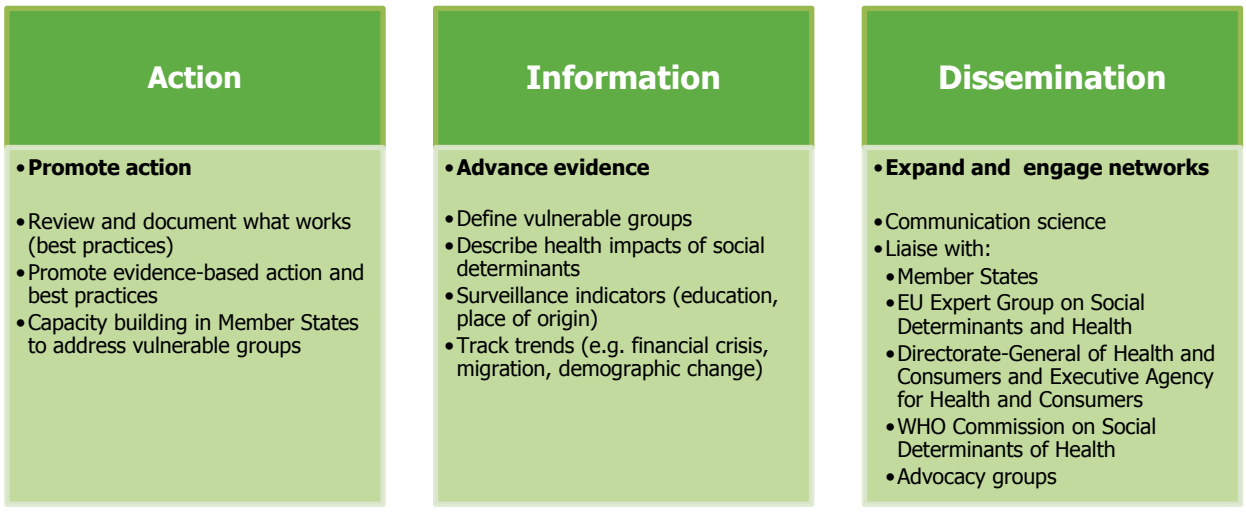
Compounding the challenges related to addressing health inequalities in Europe, the turmoil created by the financial crisis has meant that many structural and intermediary determinants have taken a turn for the worse, leading to even greater socio-economic inequalities and thereby potentially exacerbating health inequalities in Europe in recent years. Not only are some populations more vulnerable, but the provision of public health in Europe has been further challenged as many Member States have had to reduce their expenditures on health.

By highlighting these issues, the European Commission has emphasised that productive economies rely upon a healthy workforce and, additionally, that health systems will need to be more innovative and efficient. As noted in 1.1, the Commission has identified several strategies for ensuring these points, consistent with the overall objective of ensuring inclusive growth.

In consideration of both the broader European Commission strategies surrounding health inequalities as well as the links between health inequalities and infectious disease demonstrated in this report, ECDC prioritised health inequalities in 2012 and 2013. ECDC's work to address health inequalities and infectious disease in European Member States is concentrated around three key pillars (Figure 6; the AID framework): promoting Action; building the Information-base, and ensuring the Dissemination of key findings through collaboration with key stakeholders. Specifically:

- **Action:** enhance Member States' capacity to act on health inequalities among vulnerable groups
- **Information**: advance evidence through studies and investigations, and by leveraging existing data sources such as the European Surveillance System
- **Dissemination**: communicate best practices and expand networks to key actors and stakeholders in the field.

**Figure 6. The AID framework for addressing health inequalities and infectious disease in Europe.**



Assessing the efficacy of and exchanging information on the implementation of public health interventions designed to address health inequalities is another area that requires further strengthening. In some instances, this may require higher-resolution surveillance data, for example through routinely incorporating socio-economic indicators like education or place of origin into disease reporting, but the pros and cons of such changes still need to be further assessed. Meanwhile, in order to strengthen European-wide ability to promote action to address health inequalities, efforts in capacity building may also need to be undertaken.

Central to all action is the availability of timely and appropriate information on social determinants and infectious disease, identifying and focusing on not only vulnerable groups but also trends in key structural and intermediary determinants, and how these impact disease outcomes.

Finally, disseminating research and best practices and ensuring a cohesive and strengthened European-wide approach to addressing health inequalities and infectious disease will require closer bonds between all relevant stakeholders. In a time of fiscal austerity and widening inequalities, exploiting synergies and ensuring a concerted European effort will be critical for improving the health of all European citizens.

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