



Operational public health considerations for the prevention and control of infectious diseases in the context of Russia's aggression towards Ukraine

8 March 2022

Key messages

- A very large number of people from Ukraine are fleeing the country and entering the European Union (EU) countries bordering the Ukraine (Hungary, Poland, Romania, Slovakia) and the EU neighbourhood country of the Republic of Moldova. Those fleeing Ukraine - mainly women and children - are currently dispersing into communities, but as more people congregate at border crossings it is likely that they will also need to be housed in reception centres.
- This operational document focuses on infectious disease vulnerabilities of those fleeing from Ukraine, and the associated requirements for infection prevention and control. It is important to note, however, that these are just few of the risks to the health and well-being of the displaced people, and that the measures described in this document should be part of a more generalised health measures provided in support of those who have been displaced.
- Public health authorities should increase awareness among their community healthcare providers regarding the need to ensure access to services and continuity of vaccination programmes, and to be aware of the vulnerability of displaced people to infectious diseases. Doctors should be informed so that they can adjust their diagnostic and reporting algorithms accordingly. This should be an integral part of the overall provision of healthcare to those fleeing Ukraine, as should the diagnosis and treatment of chronic disease and mental and psychosocial health.
- Ensuring continuity of routine vaccinations and addressing gaps in prior vaccination histories is an essential element of the public health support for displaced people. In this context, ensuring vaccination coverage against poliomyelitis, measles and COVID-19 should be a priority. Vaccination acceptance also needs to be assessed and addressed among those fleeing Ukraine.
- Surveillance systems should be enhanced by increasing awareness among health professionals taking care of displaced people, to ensure that vaccine-preventable diseases and other communicable diseases are appropriately detected.
- Syndromic surveillance should be considered for those accommodated in reception centres.
- In people presenting with traumatic wounds, healthcare providers should be made aware that infections associated with these injuries can often include infection due to multidrug-resistant organisms. Diagnostic and treatment procedures should therefore be appropriate for identifying and managing such organisms.
- Health risk communication activities should follow the standard principles of consistency and clarity and attempt to acknowledge and clear up any uncertainties that may exist.

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*Erratum: 10 March 2022 – text in third paragraph, third sentence on p.5 changed from 'one dose of DT-IPV-containing vaccine' to 'one dose of diphtheria, tetanus, and polio-containing vaccines' and in Table 2, third row right, under 'Adults >18 years' text changed from 'three doses of DTaP-IPV** containing vaccines' to 'a primary series of diphtheria, tetanus, and polio vaccines' and the note ** deleted.*

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Scope of this document

This document aims to provide operational guidance for the prevention and control of infectious diseases in the context of mass exodus of displaced people from Ukraine. It is important to note, however, that these are just few of the risks to the health and well-being of the displaced people, and that the measures described in this document should be part of a more generalised health measures, including diagnosis and treatment of chronic disease and mental and psychosocial health.

Target audience

The priority target audience for this guidance is public health authorities, frontline healthcare workers and general practitioners in the EU countries bordering Ukraine (Hungary, Poland, Romania, and Slovakia), the EU neighbourhood country of the Republic of Moldova and other EU/EEA countries receiving displaced people from Ukraine.

Background

Since the onset of Russia’s aggression towards Ukraine on 24 February 2022, and as of 6 March 2022, more than 1.6 million Ukrainians have fled to Poland, Hungary, Moldova, Slovakia, Romania, and from there a proportion are dispersing to other EU/EEA countries [1].

Media citing the European Commissioner for Humanitarian Aid and Crisis Management report that ‘for the humanitarian situation overall, the currently expected number of displaced Ukrainians is over seven million’ [2]. The same source, citing United Nations (UN) estimates, reported that around seven million Ukrainians will be internally displaced and an additional four million are expected to flee the country.

The majority of these people are currently women and children who, according to media reports, have spent up to 60 hours at border crossings in very low temperatures [3].

According to information that ECDC has received from the countries bordering Ukraine, the majority of those arriving are dispersing into the community or in transit to other EU countries. A certain number of people are staying in the reception centres at the borders, although the number varies for each country. However, as the situation escalates this may change rapidly as more people flee the Ukraine.

To facilitate border crossing, some of the border countries (e.g. Poland [4], Romania [5] and Slovakia [6]) have scaled down COVID-19 travel restrictions. In addition, the European Commission (EC) has provided operational guidelines to facilitate border crossings at the external borders to Ukraine [7] and the European Council has adopted a temporary protection directive for Ukrainians fleeing to neighbouring EU Member States [8].

1. Infectious disease vulnerabilities of specific relevance

Displaced people entering the EU/EEA from Ukraine may be vulnerable to developing certain infectious diseases, particularly as a result of their temporary living conditions and the situation they face during displacement. It is important that they benefit from the same level of protection as the host country population in terms of infectious disease prevention and control measures, including those diseases which can be prevented by routine vaccinations. However, those arriving may be subject to specific risks due to the increased incidence of various infectious diseases in their country of origin, the disrupted living conditions before and during their displacement and difficulties accessing healthcare in the host country. This section aims to provide information on infectious disease vulnerabilities and occurrence reported in Ukraine which would need to be monitored in those fleeing the aggression and entering EU/EEA countries.

When providing care for the displaced people, healthcare practitioners should pay particular attention to several communicable diseases, as part of an integrated approach to healthcare provision [9,10]. In some circumstances, it may be appropriate to establish syndromic surveillance to enable the rapid detection of high priority diseases (further details are provided in Annex 2).

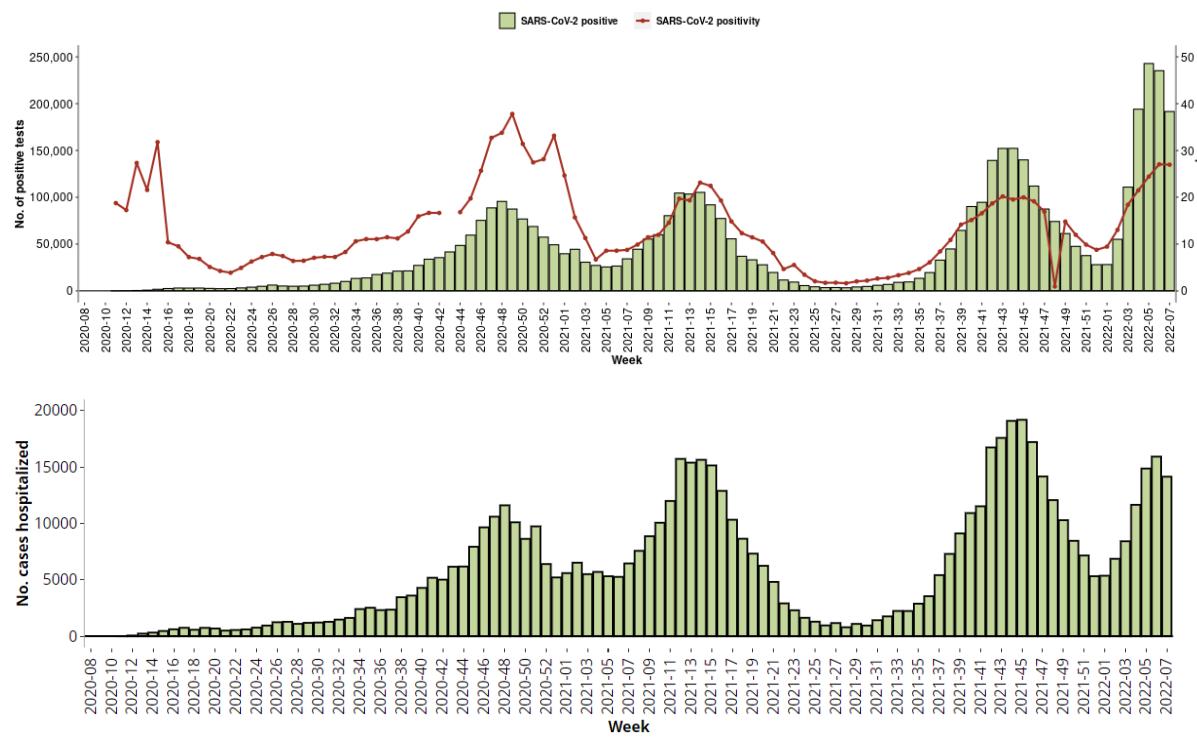
Those arriving from Ukraine, particularly children, may be more vulnerable to vaccine-preventable diseases (see 2.1) and poliomyelitis and measles should be considered priority diseases for monitoring and surveillance (see. 3.1 and Table 1).

In Ukraine, there is still considerable vulnerability to polio particularly for children <6 years of age, primarily due to the insufficient level of vaccination coverage (see Table 1). Overall vaccination coverage for polio was 80% in 2021 and this level of coverage has not been exceeded in recent years. Vaccination coverage varies depending on the age group and the region of the country, ranging from around 60% to 99% [11]. In certain oblasts in the west of Ukraine, the vaccination coverage is considerably lower than in the neighbouring host countries. A national vaccination campaign began on 1 February 2022, but this was disrupted by Russia's aggression. Both injectable and oral polio vaccines are used in Ukraine [12].

Vulnerability to measles is also a serious concern, as the overall vaccination coverage for two doses of measles-containing vaccine (81.9% in 2020 [13]) is insufficient to prevent outbreaks. The number of cases reported in Ukraine fell significantly in 2020 and 2021 compared to the two previous years (see Table 1), which may be explained by non-pharmaceutical measures such as lockdowns due to the COVID-19 pandemic. Crowding in bomb shelters and reception centres could facilitate the start of a measles outbreak particularly as spring coincides with the natural seasonality of the disease.

Since the start of the COVID-19 pandemic and as of 2 March 2022, a total of 4 849 022 confirmed SARS-CoV-2 infections and 106 239 COVID-19 deaths have been recorded in Ukraine [14]. Emergence of the Omicron variant of concern [15] resulted in the fourth and largest wave of SARS-CoV-2 transmission in the country (Figure 1), which recorded its highest 7-day average daily case rate of 35 978 cases as recently as 10 February 2022 [16]. Although the number of sequences submitted to the GISAID-EpiCoV database in recent weeks has been very limited, available sequence data indicate that Omicron is currently the principle variant in circulation [17]. Six COVID-19 vaccines are approved for use in Ukraine: Spikevax, Comirnaty, COVID-19 Vaccine Janssen, Vaxzevria, Covishield and CoronaVac [18]. Data as of 23 February 2022 show that uptake of a primary COVID-19 vaccination series in the total population (35.0%) [19] is substantially lower than the EU/EEA average (71.7% as of 1 March 2022) [15]. Vaccine uptake is uniformly low across adult age groups, including those aged over 60 years, who are at greatest risk of severe disease [20].

Figure 1. Upper panel: Ukraine weekly SARS-CoV-2 positive tests and positivity rate. Lower panel: Ukraine COVID-19 hospitalisations*



* Please note the differences in y-axis scales.

Source: Joint ECDC-WHO Regional Office for Europe Weekly COVID-19 Surveillance Bulletin [20].

Seasonal influenza is also still circulating. Low vaccination coverage against seasonal influenza has been reported for the season 2021–2022 in Ukraine, with only 164 939 people vaccinated since the beginning of the current influenza season as of week 7 in 2022 (ending 20 February 2022). Vaccination coverage was also low in 2021, with approximately 167 000 individuals vaccinated.

Tuberculosis (TB) remains a major public health problem and a priority communicable disease in Ukraine. According to the 2021 annual tuberculosis surveillance and monitoring in Europe, based on 2019 data, Ukraine reported the second highest number of TB cases (28 539), with an incidence of 65 cases per 100 000 and a mortality rate of 7.3 deaths per 100 000. Ukraine is one of 10 countries globally with the highest burden of multi-

drug resistant tuberculosis (MDR-TB), and in 2019 Ukraine reported 27% MDR-TB among new cases (4 490 cases). Ukraine also has the second highest prevalence of HIV/TB coinfection (26%) in the World Health Organization (WHO) European Region (7 800 cases in 2019).

HIV remains a public health issue and a priority communicable disease in Ukraine. According to the 2021 annual HIV surveillance report in Europe, based on data from 2020, Ukraine reported 15 658 new HIV diagnoses [21]. In 2020, the rate of HIV diagnosis for Ukraine was the second highest in the WHO European Region: 37.5 per 100 000 population compared to the EU rate of 3.3 per 100 000 population [21]. In 2020, it was estimated that 257 000 people were living with HIV in Ukraine [22]. In 2020, it was estimated that 146 000 of those living with HIV in Ukraine were receiving antiretroviral medication (57% treatment coverage) [22]. Treatment coverage in the EU is estimated to be at 82% [22].

Given that reports in the media have described displaced Ukrainians as fleeing with their pets, the European Commission has decided to ease the process for non-commercial movement of pet animals into EU territory in the context of the Ukrainian crisis [23]. It should also be borne in mind that rabies is still endemic in sylvatic animals, as well as in dogs and cats in Ukraine.

1.1 Vaccine-preventable diseases and vaccine coverage in Ukraine

This section provides an overview of the most relevant vaccine-preventable diseases to consider in the current situation, based on available information (see Section 2 above). Table 1 shows the number of cases of relevant vaccine-preventable diseases in the last four years and the corresponding vaccination coverage in Ukraine.

Table 1. Vaccine-preventable diseases of particular importance in the context, prevalence and vaccination coverage in Ukraine

Disease	Number of cases				Vaccination	
	2018	2019	2020	2021	Vaccine type	Vaccine coverage 2020
COVID-19	NA	NA	1 074 093 [24]	3 676 342 [24]	Uptake of primary series COVID-19 vaccine (%)	35.0% (as of 23 February 2022)* [19]
Diphtheria	10 [25]	0	0	0 [26]	DTP-containing vaccine, third dose	81.3% [25]
<i>Haemophilus influenzae</i> type B (HIB)	NA	NA	NA	NA	Hib3	85.2% [25]
Hepatitis B	NA	NA	NA	NA	HepB3	80.9% [25]
Measles	53 219 [25]	57 282 [25]	264 [25]	16 [26]	Measles-containing vaccine, second dose	81.9% [13]
Meningococcal disease	271 [26]	299 [26]	137 [26]	91 [26]	NA	NA
Mumps	502 027 [25]	169 799 [25]	269 630 [25]	175 [26]	NA	NA
Pertussis	2 214 [25]	2 314 [25]	1 041 [25]	NA	DTP-containing vaccine, third dose	81.3% [25]
Pneumococcal disease	NA	NA	NA	NA	NA	NA
Polio	0 [27]	0 [27]	0 [27]	2**	Pol3	84.2% [25]
Rubella	235 [25]	138 [25]	36 [25]	20 [26]	Rubella-containing vaccine, first dose	84.9% [25]
Tetanus	19 [26]	15 [26]	12 [26]	7 [26]	DTP-containing vaccine, third dose	81.3% [25]
Tuberculosis	NA	NA	NA	NA	BCG	92.7% [25]

* As week 52, 2021, cumulative uptake of complete series of COVID-19 vaccines in healthcare workers was 79.1% and 30.6% in the age group of 60+ years [20].

**In 2021, two cases of circulating vaccine-derived polio virus type 2 (cVDPV2) were reported, resulting in flaccid paralysis. Nineteen contacts were identified as infected with the virus, but did not develop paralysis [28].

Ensuring continuity of routine vaccinations, and addressing gaps in prior vaccination histories, is an essential element of the public health support required by displaced people. Vaccination status for displaced people should be assessed using available documentation, physical or electronic. For COVID-19 vaccination, it should be noted that Ukraine has joined the EU Digital COVID Certificate system [29].

Supplementary vaccination should be offered as needed, in accordance with the national immunisation guidelines of the host EU/EEA country (information on country-specific immunisation programmes can be obtained from ECDC's website¹ for EU/EEA countries or WHO's website² for all countries). If no documentation exists, or if it is uncertain, the individual should be considered as unvaccinated.

Table 2 provides an overview of the vaccinations to be offered in the absence of documented evidence of prior vaccination. Where possible, combination vaccines should be used to facilitate vaccination.

Priority should be given to protection against easily transmitted infectious diseases possibly associated with serious outcomes, such as COVID-19, measles, and poliomyelitis. Primary vaccination with combination vaccines covering diphtheria, tetanus, poliomyelitis, pertussis and invasive disease caused by *Haemophilus influenzae* type b (Hib) should be offered to infants and young children. If there is a vaccine shortage, children should be prioritised, but at least one dose of but at least diphtheria, tetanus, and polio vaccines should also be administered to adults for whom there is no documented evidence of prior vaccination. In addition, protection against rubella and mumps is provided as part of the measles/mumps/rubella (MMR) vaccine.

Additional vaccinations should be considered for protection against the following diseases depending on living conditions, season and epidemiological situation: hepatitis B (with or without screening, according to the guidelines in the host country); invasive meningococcal disease (the disease is common in densely-populated settings such as refugee camps or reception centres, and the vaccine is included in many routine programmes in EU countries); varicella (the disease is common in crowded settings and the vaccine is included in some routine programmes in EU countries); invasive pneumococcal disease (the vaccine is included in many routine programmes in EU countries); and influenza (the disease is common in crowded settings during influenza season – the vaccine is included for all children above the age of six months in routine programmes in some EU countries and for risk groups, including the elderly, in all EU routine programmes).

For best protection of the individual, administer and document first doses of the vaccine series listed below as early as possible after entry into or registration in a host country, preferably within 14 days, especially for the priority vaccines. The vaccine series can then be continued or supplemented with additional vaccines at the place of long-term residence in accordance with the guidelines of the host country. Adverse events following immunisation should be monitored and reported in accordance with the procedures in the host country. A physical or digital record of vaccination should be provided, including proof of vaccination for those who are immunised while in transit to another host country.

Table 2. Vaccinations to be offered in the absence of documented evidence of prior vaccination [9,10]

Disease	Children and adolescents (<18 years)	Adults (> 18 years)
Priority vaccinations		
COVID-19	<p>Offer primary vaccination course with an mRNA vaccine to eligible children and adolescents according to guidelines in host country (Comirnaty in ≥5 years of age and Spikevax ≥6 years of age are authorised in EU/EEA) [30].</p> <p>Offer a booster dose to adolescents ≥12 years of age according to guidelines in host country (only Comirnaty authorised in EU/EEA) [31,32].</p>	<p>Offer primary vaccination and booster dose(s) to all adults according to guidelines in the host country.</p> <p>The use of a one-dose primary course vaccine (e.g. Janssen COVID-19 vaccine) may be considered, especially if the administration of a second dose to complete the primary series could be challenging.</p>
Measles, mumps, rubella	<p>Offer MMR to individuals ≥9 months of age. Two doses of MMR* should be administered at least one month apart, but preferably longer in accordance with the guidelines of the host country. Measles vaccine provided before 12 months of age does not induce protection in all and should be repeated after 12 months of age.</p>	<p>Offer either one dose or in accordance with the guidelines in the host country.*</p>
Diphtheria, tetanus, pertussis, poliomyelitis, Hib	<p>Offer to individuals ≥ 2 months, three doses of DTaP-IPV-Hib (Hib-component only for children <6 years unless other country-specific recommendations) containing vaccines at least one month apart, followed by a booster dose in accordance with the guidelines in the host country. Pentavalent and hexavalent combination vaccines are authorised up to six years of age.</p>	<p>Offer to all adults, a primary series of diphtheria, tetanus, and polio vaccines, or according to the guidelines in the host country.</p>
To be considered		
Hepatitis B	<p>Offer to individuals ≥2 months, three doses according to the guidelines in the host country.**</p> <p>Offer to new-born infants of HBsAg-positive mothers within 24 hours of birth, according to the guidelines in the host country.</p>	<p>Offer to all adults, with or without previous screening, according to the guidelines in the host country.</p>

¹ Available at: <https://vaccine-schedule.ecdc.europa.eu/>

² Available at: https://apps.who.int/immunization_monitoring/globalsummary

Disease	Children and adolescents (<18 years)	Adults (> 18 years)
Meningococcal disease	Apply guidelines of the host country for meningococcal vaccines against serogroups A, B, C, W135 and Y, taking into account the epidemiological situation.	
Pneumococcal disease	Offer to individuals ≥2 months with 1–3 doses of conjugate vaccine at least one month apart, according to the guidelines in the host country.	Offer to individuals ≥ 65 years, according to guidelines of host country.
Varicella*	Guidelines of the host country should be followed, unless the epidemiological situation suggests otherwise. If used, offer two doses of varicella to individuals ≥ 11 months of age, at least one month apart, but preferably longer.	Guidelines of host country should be followed, taking into account the epidemiological situation. Consider vaccinating non-immune non-pregnant women of childbearing age.
Influenza	Guidelines of host country should be followed, unless the epidemiological situation suggests otherwise. Consider vaccinating risk groups aged over six months ahead of and during the influenza season.	Guidelines of the host country should be followed, taking into account the epidemiological situation. Consider vaccinating risk groups, including pregnant women, ahead of and during influenza season.
Tuberculosis	Offer BCG according to the guidelines of the host country. Re-vaccination with BCG is not recommended.	BCG is generally not recommended for adults, depending on the epidemiological situation.

* MMR and varicella vaccines are contra-indicated in immunocompromised individuals and during pregnancy. Pregnancy should be avoided for one month after MMR vaccination.

** Tests for hepatitis B virus infection (HBsAg) could be carried out before the vaccine is administered, depending on the guidelines in the host country.

Facilitating vaccine acceptance and uptake in receiving countries

Sub-optimal coverage for COVID-19 vaccination has been observed in many EU/EEA countries, as well as in other countries in eastern Europe. Those who are unvaccinated are vulnerable to upsurges of SARS-CoV-2 and other vaccine-preventable diseases, particularly in situations where under-vaccinated populations are in transit or living in crowded conditions. Efforts may therefore be required to ensure adequate levels of vaccination among host country populations, if not already achieved, as well as among the displaced populations. Public health authorities in EU/EEA countries that are currently receiving displaced persons from Ukraine may wish to refer to ECDC's technical report on facilitating vaccination acceptance and uptake in the EU/EEA [33]. Organising national campaigns or vaccination days offering vaccines to all can also help avoid stigmatising the displaced population.

The report presents the '5Cs' model as a framework for designing appropriate strategies to facilitate vaccination acceptance and uptake. The 5Cs (in English) are Confidence, Constraints, Complacency, Calculation and Collective responsibility. A first step is to conduct a diagnosis of which of the 5Cs are relevant for the displaced population. The report presents tools for diagnosis and examples of interventions that have been implemented in the EU/EEA for each of the 5Cs. Interventions may need to be adapted to specific local contexts – there is no 'one-size-fits-all' approach. While this technical report focuses on COVID-19 vaccination, the 5Cs model can be applied to any vaccination – COVID-19, routine childhood vaccinations, TB vaccination, or seasonal influenza vaccination. An infographic depicting the 5Cs is also available for download [34].

The technical report on facilitating vaccination acceptance is available in all EU/EEA official languages on ECDC's website. Russian and Arabic language translations can also be obtained by writing to info@ecdc.europa.eu. In addition to the technical report, ECDC has produced a freely available 30-minute video on this topic, entitled *Understanding Vaccine Acceptance & Strategies to Increase Vaccine Uptake* [35].

1.2 Considerations for hospitalised patients

According to media and information provided to ECDC by the bordering countries, designated hospitals will receive the wounded from Ukraine for treatment.

High rates of antimicrobial resistance (AMR) are reported in Ukraine, particularly in gram-negative bacteria. For example, Ukraine reported the following AMR proportions in invasive gram-negative bacteria isolates (most bloodstream infections) to the Central Asian and European Surveillance of Antimicrobial Resistance (CAESAR) network for 2020: *Escherichia coli*, resistance to third-generation cephalosporins, 53% (24/45); *Klebsiella pneumoniae*, resistance to carbapenems, 54% (53/99); *Acinetobacter* spp., resistance to carbapenems, 77% (37/48). For *Staphylococcus aureus*, the proportion of meticillin-resistant isolates (i.e. MRSA) was 18% (15/83) [36].

Among casualties with injuries caused by the current aggression in Ukraine, traumatic wounds are of particular concern since they may lead to infections with multidrug-resistant *A. baumannii*, *K. pneumoniae* and other multidrug-resistant organisms [37]. In 2015, Czechia reported a case of NDM-1-producing *K. pneumoniae* ST11, recovered from a patient injured during the Maidan revolution in Ukraine [38].

Displaced people may also have been exposed to multidrug-resistant organisms during recent contact with healthcare services in countries with high prevalence of multidrug-resistant organisms in healthcare settings [39], either in their home country or a country through which they may have travelled in transit.

Healthcare providers should be aware of these risks so they can diagnose and successfully treat infections with multidrug-resistant organisms in displaced and wounded people in a timely manner, thus preventing transmission of such organisms in hospitals and other healthcare settings. Patients transferred from hospitals in Ukraine, or with a history of hospital admission in Ukraine in the last 12 months should be isolated pre-emptively and screened for carriage of multidrug-resistant organisms. In particular, they should be screened for carbapenem-resistant Enterobacterales in accordance with local guidance for infection prevention and control in healthcare settings [40]. In addition, to prevent infection and/or colonisation with multidrug-resistant organisms, multimodal infection prevention and control (IPC) strategies should be implemented, such as hand hygiene, screening, contact precautions, patient isolation (single room isolation or cohorting) and environmental cleaning.

For COVID-19, hospitals and other healthcare settings should ensure that measures to prevent transmission of SARS-CoV-2 are in place [41]. This includes the screening of all patients with rapid antigen tests upon hospital admission and at regular intervals during the hospital stay [15], and the wearing of universal surgical or high-efficiency face masks, in accordance with national guidance [41].

1.3 Considerations for reception centres

As mentioned above, during the first week of the Russian invasion of Ukraine, most of those entering the EU are dispersing into the community. However, an increasing number of displaced people arriving in bordering countries are also being hosted in reception centres, where there is known to be a higher risk of communicable disease outbreaks [42,43].

Factors that increase the vulnerability of displaced people to infectious diseases include poor access to quality healthcare, overcrowding or shared accommodation, poor sanitation facilities and inadequate nutrition [10,44,45]. Outbreaks of upper respiratory infection are very common in crowded settings and at present, in addition to common cold viruses, SARS-CoV-2 and seasonal influenza would be the main viral pathogens to consider. There are recent examples of COVID-19 outbreaks detected in camp settings in Greece [46–50], Germany [51] and in the Netherlands [52]. Basic water, sanitation and hygiene standards, appropriate ventilation, avoidance of crowding and face masks should be available at all times as required in reception centres.

Vaccine-preventable disease outbreaks (e.g. measles and varicella) are also frequently reported in reception centres, as are food and waterborne diseases caused by *Salmonella* spp., *Shigella* or enteroviruses. Crowded living conditions may increase the risk of infestations with scabies, lice and/or fleas. In rare cases the latter can spread louse-borne diseases [9].

To prevent and control the transmission of any communicable disease in reception centres, it is important that the centres assess their needs for communicable disease control, particularly in the event of a sudden influx of displaced persons. In addition to the current guidance document, ECDC has compiled a preparedness checklist tool against communicable disease outbreaks at reception centres which may be useful [53].

2. Surveillance considerations

For the purpose of this document, two types of accommodation setting for people displaced from Ukraine have been identified (reception centres and community settings) since they are associated with different challenges both in terms of health risk (e.g. infections in crowded settings) and surveillance (e.g. syndromic surveillance in reception centres would not capture infections occurring in the community) [54]. Irrespective of the setting, we attempt to highlight those aspects specific to the situation in Ukraine and those in the bordering countries receiving people displaced from Ukraine.

2.1 Syndromic surveillance - reception centres

In 2016, ECDC published a handbook on implementing syndromic surveillance in migrant reception/detention centres and other refugee settings to assist public health authorities in developing syndromic surveillance in the context of a large influx of migrants in EU/EEA in the mid-2010s [55]. Most of the technical and practical aspects of establishing syndromic surveillance systems described in this handbook are still valid. The handbook provides a detailed description of the three phases for establishing syndromic surveillance (preparation, piloting and implementation). It also provides examples of syndromes, with their definition and possible indicators for monitoring and triggers for action.

2.2 Community-based disease surveillance

Host countries should ensure that displaced persons from Ukraine living in the community have access to healthcare services equivalent to that of the local population. This will help continuity of care and prevent complications due to medical preconditions. It will also facilitate early treatment of acute conditions and the early detection of diseases with the potential for community transmission.

Community-based surveillance in receiving countries should include coverage of displaced people from Ukraine as well as the local population, particularly with regard to diseases or conditions which people may be more vulnerable to, as a result of low vaccine coverage, disrupted conditions and the presence of vectors or other environmental factors (see Annex 2). Table 3 in Annex 2 provides an overview of the main syndromes and corresponding aetiological suspicions that may prompt specific testing and public health action.

Due to the vulnerability associated with sub-optimal poliomyelitis vaccination coverage in Ukraine, countries receiving displaced people from Ukraine are urged to review their environmental surveillance for polio- and enteroviruses, used as a complement to the acute flaccid paralysis (AFP) surveillance systems. Environmental surveillance can identify areas of circulation or transmission of polioviruses, since the majority of polio cases are asymptomatic, but excrete poliovirus in faeces for periods of up to several weeks. Investment in both systems is needed - verification of the adequacy of sampling and operational protocols, and potential enhancement of environmental surveillance around reception centres [56].

3. Healthcare in the community for displaced people

While this operational document focuses on infectious disease vulnerabilities connected to the movement of people from Ukraine, it is important to note that these are just some of the risks to the health and well-being of the displaced people. Other health risks include disruption of healthcare (particularly chronic care, such as cancer treatment, diabetes, or interruption/loss of prescription medicine), environmental hazards (e.g. exposure to cold or dehydration on the way to a border crossing) and, most importantly, psychological stress and mental health issues (e.g. post-traumatic stress disorder (PTSD)) which may not manifest until weeks after displacement [57,58]. Practical issues that countries receiving people fleeing from Ukraine should consider include: [79,80]. Countries receiving people fleeing from Ukraine should consider the following practical issues:

- expediting decisions on access to healthcare and healthcare benefits for the population (many people will have lost their medicines and/or need to continue treatments);
- providing information material in Ukrainian on administrative procedures, accessing healthcare, prescriptions, housing, schools, etc.;
- providing interpreting services for healthcare providers in the community and in hospitals. Community interpreters are particularly useful and can be trained as cultural mediators to assist at various levels in the healthcare system;
- expediting decisions on vaccination strategies/procedure for accessing vaccinations and documentation for those arriving from Ukraine (see Table 2)
- protecting unaccompanied minors and establishing procedures to ascertain age, as this may be challenging in unaccompanied adolescents.

Increase awareness of community healthcare professionals

Given that the majority of the incoming population are women and children and that they are mostly hosted in the community, public health authorities in the receiving countries should increase awareness among their community healthcare providers in order to detect priority infectious diseases, along with chronic diseases and mental health issues. Doctors should be informed so that they can adjust their diagnostic algorithms accordingly. They should also be provided with a list of diseases that may occur among the displaced population, and instructions for disease notification. Such instructions should include case definitions, timing, mode of reporting, and public health actions requested at the point of care. Emphasis should be placed on vaccine-preventable diseases such as poliomyelitis, measles and COVID-19 (see Table 2, Tables 3 and 4 in Annex 2).

Continuity of care for the displaced people

Community healthcare settings should also be aware that a number of the displaced people may need appropriate referrals and continuity of care for their chronic health problems and/or previously diagnosed diseases such as TB, HIV, hepatitis, etc. Discontinuing such care may have a serious public health impact as patients may become resistant to the medication or may relapse and become infectious again.

Ease of access and responsiveness can be enhanced by offering integrated services that take into account multiple infections, rather than just screening for TB, for example. This will require working more closely with the communities

of displaced people, collaboration between public health, primary care and specialist care services and culturally competent staff who can manage infectious diseases and other health needs with the help of interpreters.

In addition, when organising specialised services to address the needs of displaced persons, it is important to keep in mind that testing is only one element of the care pathway and, without follow-up treatment, there is limited individual or public health benefit. At each stage of the care pathway cases may be lost due to the personal and system-level barriers faced by displaced people in accessing the appropriate health services [10]. Continuity of care for those crossing borders to flee the aggression is a further challenge at this point as paperwork for prior diagnoses and treatments would be missing.

4. Behavioural issues and risk communication

The arrival of displaced people in a country brings with it a responsibility for the host country authorities to provide health information to all newcomers so that they can effectively prevent disease and seek care, as necessary. Such risk communication activities should follow the standard principles of consistency and clarity and attempt to acknowledge and clear up any uncertainties that may exist. Messages should also be disseminated, using trusted spokespeople, through channels that are easily accessible to the target population [59]. Other key issues for consideration include:

Trust-building and community engagement: a population that has a high degree of trust in the authorities will be more likely to adhere to any recommended measures (e.g. concerning the prevention and control of COVID-19). Authorities in the host countries may therefore consider coordinating with and supporting non-governmental organisations who are already working with or embedded within the displaced people [60].

Vulnerable populations: it is important to identify, inform and provide support for vulnerable individuals and groups among the displaced, such as the elderly, children, pregnant women, people with underlying health conditions, people living with disabilities and ethnic minorities [61].

Addressing misinformation: displaced people may be especially vulnerable to misinformation, disinformation and rumours, which can undermine their health. It is therefore important for the authorities in host countries to establish procedures to identify and rapidly address such misinformation (e.g. on social media platforms) [62] [84].

Issues specific to COVID-19: the non-pharmaceutical interventions recommended in the host country may not be the same as those recommended in Ukraine. Host country authorities may therefore wish to consider identifying any differences and ensuring that displaced people are fully informed of the local recommendations. Risk communication activities should also vigorously promote vaccination against COVID-19 for displaced people, including messages about the effectiveness and safety of the vaccines and the important role that they have played in averting severe disease, hospitalisation, and death [63].

Behavioural insights research: it is important to monitor the perceptions, beliefs and needs of the displaced people as a means of ensuring that risk communication activities and related services are being properly targeted. Quantitative and qualitative data on these issues can be collected through a range of methods, including surveys, key-informant interviews, and focus group discussions [64].

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Annex 1. Abbreviations

5Cs	Confidence, Constraints, Complacency, Calculation, and Collective responsibility
AFP	Acute flaccid paralysis
AMR	Antimicrobial resistance
BCG	Bacillus Calmette–Guérin
CAESAR	Central Asian and European Surveillance of Antimicrobial Resistance
CCHF	Crimean-Congo haemorrhagic fever
COVID-19	Coronavirus disease 2019
DTaP	Diphtheria, Tetanus, and acellular Pertussis
DTP	Diphtheria, Tetanus, and Pertussis
EC	European Commission
ECDC	European Centre for Disease Prevention and Control
EEA	European Economic Area
EU	European Union
HBsAg	Hepatitis B surface antigen
HepB3	third dose of Hepatitis B vaccine
HIB	<i>Haemophilus influenzae</i> type B
HIV	Human immunodeficiency virus
IMD	Invasive meningococcal disease
IPD	Invasive pneumococcal disease
IPV	Inactivated polio vaccine
MDR TB	Multi-drug resistant tuberculosis
MMR	Measles, mumps, rubella
MRSA	Meticillin-resistant <i>Staphylococcus aureus</i>
NDM	New Delhi metallo-beta-lactamase 1
NS	Not under epidemiological surveillance
Pol3	third dose of polio vaccine
RSV	Respiratory syncytial virus
SARS-CoV-2	Severe Acute Respiratory Syndrome-Corona Virus-2
TB	Tuberculosis
UN	United Nations
UNHCR	United Nations High Commissioner for Refugees
XDR TB	Extremely drug-resistant tuberculosis
WHO	World Health Organization

Annex 2. Syndromes, targeted diseases and reported occurrence in the Ukrainian population

Table 3. Syndromes, targeted diseases and reported occurrence in the Ukrainian population

Syndromes	Targeted diseases and conditions (examples)	Reported occurrence in Ukraine	Priority
Acute respiratory infection or influenza-like illness	<ul style="list-style-type: none"> • Seasonal influenza; • RSV infection • COVID-19; • Pneumococcal disease; • Legionnaires' disease; • Common cold (adenovirus, rhinovirus, parainfluenza virus, other human seasonal coronaviruses, etc.) 	<ul style="list-style-type: none"> • As of week 7, 2022 (ending 20 February 2022) the level of influenza like illnesses (ILI) has exceeded the epidemic levels for the 2021–2022 season, with 27.5% of cases reported in children under 17 years of age [65]. • No Legionnaires disease cases have been reported in the past two years [26]. • High levels of community SARS-CoV-2 transmission were observed in week 7, 2022. Only 35% of the total population have completed a primary COVID-19 vaccine course. 	High
Acute paralysis	<ul style="list-style-type: none"> • Acute flaccid paralysis/paralytic poliomyelitis; • Botulism; • Tetanus • Other. 	<ul style="list-style-type: none"> • In 2021, several cases of vaccine derived polio virus (VDPV) 1 and 2 were detected in Ukraine [66], of these two cases with acute flaccid paralysis were confirmed with VDPV2 [67]. Children under six years of age are especially vulnerable to polio in Ukraine [66]. • Cases of food-related botulism are reported annually in Ukraine (100-200 cases/year, 2017–2020) with an increase in May–June. Outbreaks are often related to home-canned food (e.g. mushrooms, meat), dried and or smoked fish [66]. • Tetanus has been reported in the past three years with seven to 15 cases reported per year [26]. 	High
Rash and fever	<ul style="list-style-type: none"> • Measles; • Rubella; • Leptospirosis • Louse-borne diseases. 	<ul style="list-style-type: none"> • A low number of measles cases was reported in 2021 (n=16) after a large outbreak in 2019 with over 57 000 cases. However, vulnerability to measles remains, due to low vaccination coverage in recent years (Table 1) [26]. • Similarly, cases of rubella have decreased from 0.33 cases per 100 000 population in 2019 to 0.05 cases per 100 000 population in 2021 [26]. Vulnerability to rubella remains due to low vaccination coverage. • A low incidence of leptospirosis was reported in 2020 and 2021: 0.29 cases per 100 000 population (approx. 120 cases per year) – a reduction by half on 2019 (0.7 per 100 000 population: 295 cases) [26]. 	High
Prolonged productive cough	<ul style="list-style-type: none"> • Pulmonary tuberculosis 	<ul style="list-style-type: none"> • Ukraine is a WHO high priority country for TB [68]. A 4.3% increase in newly registered TB cases was reported in 2021, rising to 44 cases per 100 000 population, from 42.2 cases per 100 000 population in 2020; incidence increased by 25% in children 0–14 years [69]. 	High

Table 4. Syndromes and diseases pertinent to populations living in reception centres (other than those in Table 3). See list of abbreviations in Annex 1

Syndromes	Targeted diseases and conditions (examples)	Reported occurrence in Ukraine	Priority
Bloody diarrhoea	<ul style="list-style-type: none"> • STEC/VTEC; • Shigellosis. 	<ul style="list-style-type: none"> • 200-300 shigellosis cases reported annually in the past two years [26]. 	High
Non-bloody gastroenteritis	<ul style="list-style-type: none"> • Viral gastroenteritis; • Cholera; • Campylobacteriosis; • Cryptosporidiosis; • Salmonellosis; • COVID-19. 	<ul style="list-style-type: none"> • Very low incidence of cholera (one case in 2019). • Decreasing number of cryptosporidiosis has been reported between 2019 and 2021 (45, 24 and 11 cases, respectively), however laboratory capacity is unknown even though this is a notifiable disease in Ukraine. Low reported incidence of campylobacteriosis (0.37 per 100 000 in 2019, 2020, 2021) [26]. • Incidence of Salmonellosis increases in summer months in Ukraine, with annual peaks seen in July–August. Annual incidence has been stable in the period 2015–2019 [70]. 	High
Meningitis, encephalitis	<ul style="list-style-type: none"> • IMD; • IPD; • Viral meningitis. 		Medium to high
Lymphadenitis with fever	<ul style="list-style-type: none"> • Diphtheria; • Tularaemia; • Plague; • Louse-borne diseases • Others. 	<ul style="list-style-type: none"> • In the period 2019-2021 0-3 cases of tularaemia were reported. • No cases of diphtheria were reported in 2019-2021 [26]. The risk of diphtheria remains, due to lower vaccination coverage in recent years. 	Medium
Sepsis or unexplained shock	<ul style="list-style-type: none"> • Includes all infections causing sepsis, severe sepsis or septic shock. 	<ul style="list-style-type: none"> • NS 	
Fever and bleeding	<ul style="list-style-type: none"> • Crimean-Congo haemorrhagic fever (CCHF) and other arboviral diseases. 	<ul style="list-style-type: none"> • Small numbers of cases of CCHF reported. There is virological or serological evidence and vector presence in Ukraine [71]. 	Low, due to currently low temperatures
Acute jaundice	<ul style="list-style-type: none"> • Acute viral hepatitis 	<ul style="list-style-type: none"> • Reported rate of travel-associated hepatitis A in travellers returning from European non-EU countries (including Ukraine) is approximately five times higher than that in travellers returning from EU countries [72]. • Acute hepatitis B cases: <ul style="list-style-type: none"> - 2020 1.74 per 100 000 (731) - 2021 1.22 per 100 000 (508) • Acute hepatitis C cases: <ul style="list-style-type: none"> - 2020 0.68 per 100 000 (287) - 2021 0.60 per 100 000 (252) • Chronic viral hepatitis cases <ul style="list-style-type: none"> - 2020 10.26 per 100 000 (4 306) - 2021 10.02 per 100 000 (4 183) [26,73] 	Medium
Skin parasites	<ul style="list-style-type: none"> • Scabies • Lice. 	NS	High in crowded settings
Unexplained deaths	<ul style="list-style-type: none"> • Many infections including COVID-19 and possibly intentional release of pathogens • Non-infectious causes. 	NS	Low

*NS: not under epidemiological surveillance

Annex 3. Infographics to aid with differential diagnosis and decisions on vaccinations

Infectious diseases to be considered for differential diagnosis among displaced people in addition to the more common causes for clinical presentations	
Clinical presentation	Differential diagnosis to consider
Fever 	COVID-19 Typhoid fever Malaria Louse-borne diseases Visceral leishmaniasis Arbovirus infections (seasonal)
Respiratory symptoms 	COVID-19 Tuberculosis Influenza
Gastrointestinal symptoms 	COVID-19 Cholera Typhoid fever Shigellosis Amoebic colitis Helminthiasis: ascaris, whipworm, hookworm
Sores 	Scabies Cutaneous leishmaniasis Cutaneous diphtheria
Skin rash 	Measles Rubella Louse-borne diseases Scabies
Meningitis and other neurological syndromes 	Invasive bacterial diseases (<i>Neisseria meningitidis</i> , <i>Haemophilus influenzae</i> type b and <i>Streptococcus pneumoniae</i>) Poliomyelitis Rabies Arbovirus infections

Link for download: <https://www.ecdc.europa.eu/en/publications-data/infographic-infectious-diseases-considered-for-differential-diagnosis-displaced-people>

Vaccinations to be offered in the absence of documented evidence of prior vaccination

Disease	Children and adolescents (<18 years)	Adults (> 18 years)
Priority vaccinations		
COVID-19	<p>Offer primary vaccination course with an mRNA vaccine to eligible children and adolescents according to guidelines in host country (Comirnaty in ≥5 years of age and Spikevax ≥6 years of age are authorised in EU/EEA). Offer a booster dose to adolescents ≥12 years of age according to guidelines in host country (only Comirnaty authorised in EU/EEA).</p>	<p>Offer primary vaccination and booster dose(s) to all adults according to guidelines in the host country. The use of a one-dose primary course vaccine (e.g. Janssen COVID-19 vaccine) may be considered, especially if the administration of a second dose to complete the primary series could be challenging.</p>
Measles mumps rubella	<p>Offer MMR to individuals ≥9 months of age. Two doses of MMR* should be administered at least one month apart, but preferably longer, in accordance with the guidelines of the host country. Measles vaccine provided before 12 months of age does not induce protection in all and should be repeated after 12 months.</p>	<p>Offer either one dose or in accordance with the guidelines in the host country.*</p>
Diphtheria tetanus pertussis polio Hib	<p>Offer to individuals ≥ 2 months, three doses of DTaP-IPV-Hib (Hib-component only for children <6 years unless other country-specific recommendations) containing vaccines at least one month apart, followed by a booster dose in accordance with the guidelines in the host country. Pentavalent and hexavalent combination vaccines are authorised up to six years of age.</p>	<p>Offer to all adults a primary series of diphtheria, tetanus, and polio vaccines or according to the guidelines in the host country.</p>
To be considered		
Hepatitis B	<p>Offer to individuals ≥2 months, three doses according to the guidelines in the host country.** Offer to new-born infants of HBsAg-positive mothers within 24 hours of birth, according to the guidelines in the host country</p>	<p>Offer to all adults, with or without previous screening, according to the guidelines in the host country.</p>
Meningococcal disease	<p>Apply guidelines of the host country for meningococcal vaccines against serogroups A, B, C, W135 and Y, taking into account the epidemiological situation.</p>	
Pneumococcal disease	<p>Offer to individuals ≥2 months with 1–3 doses of conjugate vaccine at least one month apart, according to the guidelines in the host country.</p>	<p>Offer to individuals ≥ 65 years, according to guidelines of host country.</p>
Varicella*	<p>Guidelines of the host country should be followed, unless the epidemiological situation suggests otherwise. If used, offer two doses of varicella to individuals ≥ 11 months of age, at least one month apart, but preferably longer.</p>	<p>Guidelines of host country should be followed, taking into account the epidemiological situation. Consider vaccinating non-immune non-pregnant women of childbearing age.</p>
Influenza	<p>Guidelines of host country should be followed, unless the epidemiological situation suggests otherwise. Consider vaccinating risk groups aged over six months ahead of and during the influenza season.</p>	<p>Guidelines of the host country should be followed, taking into account the epidemiological situation. Consider vaccinating risk groups, including pregnant women, ahead of and during influenza season.</p>
Tuberculosis	<p>Offer BCG according to the guidelines of the host country. Re-vaccination with BCG is not recommended.</p>	<p>BCG is generally not recommended for adults, depending on the epidemiological situation.</p>

* MMR and varicella vaccines are contra-indicated in immunocompromised individuals and during pregnancy. Pregnancy should be avoided for one month after MMR vaccination.

** Tests for hepatitis B virus infection (HBsAg) could be carried out before the vaccine is administered, depending on the guidelines in the host country.