

EVIDENCE BRIEF

Public Health Hazard Identification and Risk Assessment (HIRA) for Ukrainian Refugees Entering Ontario

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Key Findings

- Large numbers of Ukrainians are fleeing the conflict in their country, and there is an expectation that some will seek resettlement in Ontario and Canada.
- Only 34% of the Ukrainian population is fully vaccinated for Coronavirus Disease 2019 (COVID-19), which is the seventh lowest in the World Health Organization (WHO) European region.
- Ukraine has a high prevalence of HIV/AIDS and multi-drug resistant tuberculosis (MDR-TB), along with low coverage for routine immunizations such as polio.
- The conflict in Ukraine will also cause a burden on mental health and will require mental health care services and support.
- Other supports to consider are sexual and reproductive health care (including sexually transmitted infection [STI] prevention, screening and treatment) as well as obstetrics, neonatal and pediatric health care.
- Proactive coordination between government immigration/resettlement, public health, social service, and health care agencies is needed to safely support arrival of Ukrainian refugees with close attention to communicable disease prevention and control activities (e.g., screening, vaccination, access to primary care).

Objective and Scope

- With the current war occurring in the Ukraine, it is expected that Canada will experience a large number of refugees, resettlement, and temporary travellers from Ukraine (e.g., via the Canada-Ukraine Authorization for Emergency Travel) entering the country.¹
- The objective of this document is to provide public health and health system stakeholders with an initial overview and assessment of the key infectious and non-infectious health risks in the Ukrainian general population, and to anticipate health risks associated with the arrival of Ukrainian migrants displaced during the current conflict. In addition, we provide some initial considerations for public health sector planning. The current health status of Ontarians was out of scope for this HIRA.
- This is an ongoing situation and an initial assessment; the HIRA will evolve with the changing situation and as new information emerges.

Background

With the Russian invasion of Ukraine, millions of refugees have reportedly already moved into neighbouring countries, as of March 6th, 2022.²⁻⁴ This is the fastest-growing refugee crisis in Europe since the Second World War.⁴ In addition, some of these displaced individuals may be seeking shelter abroad, including in Canada, where the Government of Canada is actively working towards implementing measures to welcome Ukrainians.¹

In the past when Canada welcomed refugees from other conflict zones such as Syria, health status for these individuals was determined by conducting a systematic review for specific regions, as well as health assessments at refugee camps. These findings were published by the WHO, European Centre for Disease Prevention and Control (ECDC) and other publications.⁵⁻⁸ Common health issues included severe oral health issues due to the lack of dental care as well as preparing for immediate treatment of injuries. At this time, information regarding the current health status of Ukrainian refugees is limited. While more information becomes available, preparing for additional situations that can arise from individuals leaving conflict zones, such as injuries, would be useful for system planning.

With the anticipated arrival of Ukrainian migrants, there is an opportunity to proactively identify the burden of infectious diseases and non-communicable health conditions and other health issues in this population. This can inform planning by Ontario's public health and health system stakeholders for managing any potential implications on the population in Ontario, including any public health risks and impacts on the health system. The Immigration Medical Exam (IME) contains policy, procedures, and guidance used by the Immigration, Refugees and Citizenship Canada organization for screening migrants.⁹ Examinations include physical exams, mental health exams, past medical history review, laboratory tests, diagnostic tests, and medical assessment of records.⁹ With the uncertainty around whether there will be pre-departure and/or post-arrival IMEs performed for some or all of the migrants from Ukraine (i.e. either those who come via the new temporary pathway vs. other), pathways to connect migrants to primary and specialist care, including for management of diseases of public health significance (e.g. tuberculosis [TB], human immunodeficiency viruses [HIV], STIs) are needed.

There are a number of factors that may have significant impacts on people's health and on Ontario's public health capacity and the broader health care system. For example, health care providers will need to be aware of recent outbreaks and the low vaccine coverage. Currently it is not known how many refugees will be coming to Ontario, nor the demographics of who will be coming. These factors will also have an effect on what measures will need to be implemented.

Ontario Context

Different from previous points in time when Canada welcomed refugees from other countries, the local and regional health system contexts are significantly challenged after two years of COVID-19 response, and limited ability to implement previously routine public health programs. The Association of Local Public Health Agencies (ALPHA) released a comprehensive summary report entitled Public Health Resilience in Ontario,¹⁰ which looked specifically at the backlog of public health programs and services created by the COVID-19 pandemic response. The report outlines secondary health impacts of the pandemic and resources public health units would require to restart important programs while continuing the COVID-19 response. Some of the key findings identified can potentially impact the health of the population in Ontario as we prepare to welcome Ukrainian refugees. In March 2020; for example, oral health screenings in schools were stopped to help manage the pandemic response. This resulted in only 2,602 children receiving oral health screenings in 2020-2021 whereas in 2019-2020, 301,830 children received oral health screenings in schools. Another potential impact includes incomplete routine immunizations as approximately 80% of school-based immunizations were not completed in 2020-2021. Discussions are currently underway to create a catch-up program for children who missed their routine school-based vaccines as well as oral health screenings, though these gaps in services likely remain at the present time.

Methods

A librarian-assisted search strategy was conducted on the arrival of large numbers of migrants from Ukraine and potential impact on the Ontario health system. The database searched was Ovid MEDLINE from 2017 to 2022. The search was limited to English-language literature. Three reviewers conducted preliminary screening first by title, then by abstract, and finally by full-text review.

In addition, a librarian-assisted grey literature search strategy was developed given the applied nature of the scoping review question. A Google search was conducted in order to examine key government, and non-governmental agencies' websites to find relevant grey literature. This search was also supplemented with resources and articles provided by content experts.

We included studies that contained epidemiology, surveillance, or prevalence of infectious diseases and non-communicable health conditions that were representative of the general Ukrainian population using data from 2017 onward. We excluded studies that were focused on prevention, efficacy of an intervention, and studies on specific populations.

We used Public Health Ontario's (PHO) HIRA Framework processes, templates and resources for mass gatherings, with a focus on infectious diseases and adapted it to the Ukrainian context.¹¹⁻¹³ The documents was then reviewed by disease and subject matter experts.

Results

From the MEDLINE database search, 474 articles were screened and included a total of 30 articles for thematic analysis. All of the published articles identified in the search were descriptive in nature and narrowed in on a specific infectious disease and/or non-communicable health condition that is endemic to Ukraine and further studied the origin, incidence and mortality within the population.

From the grey literature search, 15 documents were screened and following a full-text review, 10 documents were included in the thematic analysis. These documents provided a high-level, brief description of the prevalence of infectious diseases and non-communicable health conditions in Ukraine. The grey literature synthesis focused specifically on documents from a third group, such as the WHO, European Centre for Disease Prevention and Control (ECDC) and United States Centers for Disease Control and Prevention (CDC).

High-level findings are organized below by disease group, followed by [tables](#) summarizing more details on the HIRA.

Respiratory Diseases

- As of the week of February 21-27, there were approximately 240,000 weekly cases of COVID-19, with 1300 deaths, with a low vaccination coverage for at-risk populations (e.g., immunocompromised and older individuals). The conflict has reduced the availability of oxygen for treatment, along with beds being repurposed for traumatic injuries and critical illnesses.¹⁴
- In 2020, the estimated active TB incidence rate in Ukraine was 73 per 100,000 population, compared to the 2020 Canadian TB incidence of 5.9 per 100,000 population.¹⁵ In 2019, 27.2% of all newly diagnosed TB cases in Ukraine involved drug-resistant TB, whereas another 6,225 cases were identified as multi-drug-resistant TB.¹⁵⁻¹⁷ Surveillance and monitoring data from 2020 shows an increasing trend in drug-resistant TB and that treatment success rates are below global and regional targets.^{18,19}

- A recent retrospective cohort study of MDR-TB cases in the Kharkiv region (with one of the highest prevalence rates of MDR-TB worldwide), found that 55% of the 169 MDR-TB cases in the study had pre-extensively drug-resistant (pre-XDR) or XDR-resistant patterns, and concluded that the high prevalence and poor treatment outcomes are due to a lack of screening, treatment, monitoring, and follow-up capacities.²⁰

Blood-borne Infections

- Hepatitis C virus (HCV) is a significant issue in Ukraine and considered endemic with about 3.6% of the population living with HCV, which is above the estimated European average of 1.5%.²¹ The Mykolaiv region in southern Ukraine is one of the worst-affected areas in the country and also suffers from high rates of HIV-HCV co-infections. HCV treatment is becoming more available in Ukraine with the help of various organizations; however, access to diagnostics and treatment remains limited, especially for vulnerable communities.²² Recently, COVID-19 preventative measures, such as closures and lockdowns, have also impeded the ability to receive healthcare.
- Ukraine has the second largest HIV epidemic in the Eastern European region, with estimates that nearly 250,000 people are living with HIV, many of whom do not know their status.¹⁶ In 2018, 67% of individuals were aware of their HIV status, 80% of those who knew their status were on HIV treatment with 95% seeing viral suppression.²³ However, when including individuals who do not know their HIV status, the data shows 54% of all people living with HIV received treatment with only 51% seeing viral suppression.²³ The HIV epidemic in Ukraine has mainly occurred among certain population groups such as individuals who inject drugs, female sex workers, and men who have sex with men.¹⁶
- In 2017, Ukraine also had the highest proportion of active TB cases co-infected with HIV in the European region at 21.6%, while the regional average was 12%. From 2008-2017, the incidence of newly diagnosed active TB cases co-infected with HIV in Ukraine increased by 89.4% (from 6.1 per 100,000 population in 2008 to 11.6 per 100,000 population in 2017). The highest incidence rates of TB/HIV co-infection are observed in males aged 25-44 years who live in the southern region of Ukraine.²⁴

Vaccine-Preventable Diseases

- A number of articles described Ukraine as having the lowest rates of routine immunization coverage in the world due to the lack of available vaccines and the distrust of vaccines by parents and medical providers.²⁵⁻³⁰ The reported national immunization coverage in 2020 was 81% for diphtheria, tetanus, pertussis; 82% for measles, mumps, rubella; and 84% for polio.³¹
 - A polio outbreak in Ukraine was confirmed in October 2021, which was caused by vaccine-derived poliovirus type 2.³² The most recent confirmation of a paralytic case was in January 2021.³³ There were plans for a supplemental polio immunization campaign to target 140,000 unvaccinated children; however, that has been paused due to the conflict.³⁴
 - COVID-19 immunization rates are also low in Ukraine, with only 34% of the population being fully vaccinated.³⁵

Chronic Disease, Oral Health and Mental Health

- There are a number of biological (e.g., obesity, blood lipid and glucose levels) and behavioural risk factors which predispose Ukrainians to higher than normal rates of chronic conditions and morbidities. This includes smoking rates, alcohol consumption and unhealthy diet patterns which result in higher than normal rates of hypertension, heart disease, obesity and diabetes.^{31,36} Additionally, acute issues related to alcohol (e.g., withdrawal, seizure) and substance use (e.g., opioid withdrawal or overdose) may occur, but were not in scope for the current review.
- The general population of Ukraine has experienced significant mental health problems, largely due to the lack of consistent standards of medical care and an effective referral network due to the ongoing conflicts.³⁷⁻³⁹ There are increased risks of psychological distress, exacerbation of chronic mental health problems and high levels of Post-Traumatic Stress Disorder (PTSD), and depression and anxiety are likely among affected populations of all ages.^{14,40}
- Cardiovascular disease, particularly myocardial infarction, plays a leading role among all causes of mortality in Ukraine.⁴¹ Tobacco use is one of the main causes of cardiovascular-related diseases, with 23% of the population using tobacco products.³⁶ Other related system-level risk factors include psychological distress and interruptions to care or medications due to rising conflicts in Ukraine.⁴²
- The prevalence and severity of dental decay is high among children in Ukraine. For example, a study found the prevalence of dental caries in 87.9% in 6 year old children and 72.3% in 12 year olds.⁴³ Another study found mean decayed, missing, and filled teeth (DMFT) among 13-14 year olds in the range of 5.7 to 9.1, depending on the place of residence in Ukraine.⁴⁴
- Ukraine is the location of the 1986 Chernobyl nuclear plant accident, which was the largest uncontrolled radioactive release in history. Studies have indicated that thyroid cancer is a health issue, along with psychological effects.⁴⁵ In general, sequelae of the Chernobyl incident were not examined as it was out of scope with the dates searched in the literature.

Detailed HIRA Summary

The full results are summarized and then separated between infectious and non-communicable health conditions with [Table 1](#) and [Table 2](#) respectively. The synthesis focused on determining and assessing the health status and needs of Ukrainian refugees and to prepare for the potential impact that the immigration of a large number of Ukrainian refugees could have on Ontario's health system, with a rationale.

An initial list of potential public health actions was developed based on risk level of the health issues identified. Risk levels align with the [Public Health Situation Analysis \(PHSA\)](#) on Ukraine by the Ukraine Health Cluster on March 3, 2022.⁴⁰ This is an initial list to consider for planning and further consultation. It should be noted that these public health actions are highlighting overall needs and that additional details (e.g. partnerships, collaborations) will need to be determined. See [Appendix Table 1](#) for definitions of risk level.

Table 1: Disease-risk matrix for infectious and communicable health conditions

Health Condition	Risk Level	Rationale	Initial List of Public Health Actions for Consideration
COVID-19 ^{14,35}	High	Diseases in this category have the potential to spread to Ontarians and others with close contact.	Enhanced surveillance, medical exams, and COVID-19 immunization.
Respiratory diseases (Tuberculosis, Influenza, Acute respiratory illness) ^{16,18-20,24,26,36,46-49}	High	Diseases in this category have the potential to spread to Ontarians and others with close contact.	Enhanced surveillance and medical exams. Ensure communication lines are in place, and proper personal protection equipment for staff.
Blood-borne infections (HIV, Hepatitis B, Hepatitis C) ⁵⁰	Med/High	The impact will be seen after the individuals have arrived.	Increased screening for new immigrants, additional care, vaccination and treatment.
Vaccine-preventable diseases (VPD) (Measles, Mumps, Rubella, Varicella, Pertussis, Invasive Meningococcal disease, Polio) ^{16,25,27-31,36,48,51-56}	Medium	Ukrainians have low routine and COVID-19 immunization coverage rates. It is assumed there will be refugees who are either currently infectious or vulnerable to VPD.	Enhanced surveillance of newly reported cases. COVID-19 immunization and record assessment to inform catch-up schedules; increased clinical suspicion among frontline health care providers for VPDs in refugees and/or contacts
Food and waterborne diseases (Food poisoning/gastrointestinal illness, Norovirus, Salmonellosis, VTEC, Hepatitis A, Shigellosis, Cryptosporidiosis, Campylobacteriosis) ^{57,58}	Medium	These tend to be among the most common infections. May not be spread by person-to-person transmission but could be a public health burden	Enhanced surveillance and communication
Sexually transmitted infections (Chlamydia, Gonorrhea, Syphilis) ^{16,48,59-62}	Medium	The impact will be seen after the individuals have arrived.	Access to timely screening and treatment.
Antimicrobial resistance and healthcare-associated infections ²⁰	Low	The impact will be seen after the individuals have arrived.	Maintain routine surveillance, additional medical exams.
Other/Emerging infectious diseases	Low	No evidence in literature/search.	Maintain routine surveillance.

Table 2: Disease-risk matrix for non-communicable and chronic health conditions

Health Condition	Risk Level	Rationale	Initial List of Public Health Actions for Consideration*
Mental Health ^{14,16,31,36-40,42,63}	High	Individuals may be experiencing acute mental health trauma due to the conflict in Ukraine and its sequelae relating to their refugee status.	Linkage with mental health services and resources. Linkage with primary and/or emergency/crisis care as appropriate.
Cardiovascular related diseases ^{31,36,41,42,48,64-66}	High	Disruption of treatment and supply of medicine (critical for high risk of worsening heart conditions or stroke). Impact may be seen after the individuals have arrived.	Linkage with primary care
Hypertension ^{31,36}	High	Disruption of treatment and supply of medicine (critical for uncontrolled blood pressure). Impact may be seen after the individuals have arrived.	Linkage with primary care
Diabetes ⁶⁷	High	Disruption of treatment and supply of medicine (critical for lack of insulin). Impact may be seen after the individuals have arrived.	Linkage with primary care
Dental Health ^{43,44,68}	Low	The impact may be seen after the individuals have arrived.	Linkage with dental care
Obesity ^{31,36}	Low	The impact may be seen after the individuals have arrived.	Linkage with primary care

***Note:** The actions listed here are largely outside the scope of public health and will require consultation and coordination with health care system partners. The initial list is provided for consideration only and implementation is deferred to health care system partners.

Conclusion

This risk assessment looks at the most notable health conditions identified in a rapid evidence review focused on Ukrainian refugees that may have an impact on public health and the health system in Ontario, ranging from short to long-term implications. While focusing on the main health issues related to Ukrainians, there are additional health issues that may not be covered by this assessment. This risk assessment also focuses on what are the immediate health issues and not what actions and/or infrastructure is needed to respond to those health concerns (e.g. outbreak response); nor the processes for detecting the health conditions as part of the migration process. Iterative assessment and analysis may be useful once there is more information on the number of Ukrainian refugees coming to Ontario and their health needs. Further, ongoing monitoring of evolving information from the WHO and other relevant public health agencies, and being reported from other countries that are taking in refugees can be valuable. Stakeholder consultation regarding potential public health and health care system actions is important.

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Appendix

Table A1: Definition of risk levels on Ontario's health system

Risk	Description
High Risk	The immigration of Ukrainian refugees, and their health conditions, could impact on Ontario's health system, with significant prolonged morbidity and some mortality. It is a high priority for planning.
Medium Risk	The immigration of Ukrainian refugees, and their health conditions, could impact on Ontario's health system, with some prolonged morbidity and mortality. It is a medium priority for planning.
Low Risk	The immigration of Ukrainian refugees, and their health conditions, will not have major effect on Ontario's health system and would be well within the capacity of the health care system to manage. It is a lower priority for planning.

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