

CANADIAN GUIDELINES FOR IMMIGRANT HEALTH

Summary of clinical preventive care recommendations for newly arriving immigrants and refugees to Canada

Kevin Pottie MD MCISc, Peter Tugwell MD MSc, J. Feightner MD MSc, Vivian Welch MSc PhD, Christine Greenaway MD MSc, H. Swinkels MD MHSc, Meb Rashid MD, Lavanya Narasiah MD MSc, Laurence Kirmayer MD, Erin Ueffing BHSc MHSc, N. MacDonald MD MSc; for the Canadian Collaboration for Immigrant and Refugee Health (CCIRH)

There are more than 200 million international migrants worldwide,¹ and this movement of people has implications for individual and population health.² The 2009 United National Development Report³ suggests migration benefits people who move through increased economic and education opportunities, but migrants frequently face barriers to local services. In Canada, international migrants are a growing and economically important segment of the population (Table 1).

Immigrants to Canada are a very heterogeneous group. Upon arrival, new immigrants are healthier than the Canadian-born population because of immigrant selection process and policies, and socio-cultural aspects of diet and health behaviours. However, there is a decline in this “healthy immigrant effect” after arrival. Refugees are at risk for a rapid decline in health after arrival (odds ratio [OR] 2.31, 95% confidence interval [CI] 1.1–4.9) as are low-income immigrants (OR 1.5, 95% CI 1.3–1.7).^{4–9} There is an increased risk of reporting poor health among immigrants with limited English- or French-language proficiency (OR 2.0; 95% CI 1.5–2.7), those with cost-related barriers to health care (OR 2.8; 95% CI 1.7–4.5),¹⁰ low-income immigrants⁷ and non-European immigrants (OR 2.3, 95% CI 1.6–3.3).⁵ Compared with the Canadian-born population, subgroups of immigrants are at increased risk of disease-specific mortality: southeast Asians from stroke (OR 1.46; 95% CI 1.00–1.91),¹¹ Caribbeans from diabetes (OR 1.67; 95% CI 1.03–2.32) and infectious diseases (e.g., Caribbeans from AIDS: OR 4.23; 95% CI 2.72–5.74), and men from liver cancer (OR 4.89; 95% CI 3.29–6.49).¹²

The health needs of newly arriving immigrants and refugees often differ from Canadian-born men, women and children. Prevalence of diseases can differ on the basis of disease exposure, migration trajectories (Figure 1), living conditions and genetic predispositions. Language and cultural differences along with lack of familiarity with preventive care and the Canadian health care system can impair access to appropriate health care services,¹³ and patients might present with conditions or concerns that are unfamiliar to local practitioners.^{4,12}

Many low- and middle-income countries have yet to develop their primary health care systems,³ and this underde-

Key points

- Although most migrants arrive in good health, certain subgroups face health risks because of differing disease exposures, genetic predispositions, social and cultural determinants, and impaired access to appropriate preventive and curative health services.
- Preventive health care topics that focused on inequities in health and clinical care gaps were chosen for study, and recommendations were formulated using systematic evidence reviews linked to GRADE guideline development.
- Clinical preventive recommendations covering cervical cancer, depression, contraception, hepatitis B, HIV, iron-deficiency anemia, oral health, pregnancy, tuberculosis and vision health are presented in this article.

velopment is a source of health inequities.¹⁴ We refer to these countries in the guidelines as “developing.”

Why are immigrant guidelines needed?

Canadian immigration legislation requires that all permanent residents, including refugees, refugee claimants and some temporary residents, have an immigration medical examination. Screening is undertaken to assess potential burden of illness and a limited number of public health risks. The examination is not designed to provide clinical preventive screening, as is

From the Departments of Family Medicine and Community Medicine (Pottie), Department of Internal Medicine (Tugwell), Institute of Population Health (Ueffing), University of Ottawa, Ottawa, Ont.; Department of Family Medicine (Feightner), University of Western Ontario, London, Ont.; Institute of Population Health (Welch), University of Ottawa, Ottawa, Ont.; Division of Infectious Diseases and Clinical Epidemiology and Community Services Unit (Greenaway), SMBD Jewish General Hospital, McGill University, Montréal, Que.; Department of Family Practice, University of British Columbia, Vancouver, BC, and Medical Health Officer, Fraser Health, Fraser, BC (Swinkels); Access Alliance Community Health Centre (Rashid), Toronto, Ont.; PRAIDA Clinic site Côtés-des-Neiges, Que., and CSSS de la Montagne (Narasiah); Department of Psychiatry (Kirmayer), McGill University, Montréal, Que., and Department of Pediatrics (MacDonald), Dalhousie University, Halifax, NS

CMAJ 2010. DOI:10.1503/cmaj.090313

Table 1: Classification of international migration to Canada (2007)*

Immigration category	Annual migration† (no.)
Permanent residents	
Economic class (business and economic migrants)	131 000
Family class (family reunification)	66 000
Humanitarian class (refugees resettled from abroad or selected in Canada from refugee claimants)	28 000
Others	11 000
Total	237 000
Temporary residents	
Migrant workers	165 000
International students	74 000
Refugee claimants (those arriving in Canada and claiming to be refugees)	28 000
Other temporary residents	89 000
Total	357 000
Other migrants	
Total irregular migrants,‡ not annual migration	~ 200 000
Visitors	~ 30 100 000

*Numbers rounded to nearest 1000.

†Unless otherwise indicated.

‡No official migration status; this population includes those who have entered Canada as visitors or temporary residents and remained to live or work without official status. It also includes those who may have entered the country illegally and not registered with authorities or applied for residence.

routinely performed in Canadian primary care practice, and is linked to ongoing surveillance or clinical actions only for tuberculosis, syphilis and HIV.⁴

The United States Preventive Services Task Force and the Canadian Task Force on Preventive Health Care have produced many high-quality clinical preventive recommendations, but these statements have not explicitly considered the unique preventive needs and implementation issues for special populations such as immigrants and refugees. Evidence-based recommendations can improve the uptake and health outcomes related to preventive services, even more so when they are tailored for specific populations.¹⁵ Immigrant-specific, evidence-based clinical guidelines have been scarce,¹⁶ and these guidelines are designed to address this gap.

In recent years, there has been an increase in development of practice guidelines for international migrants.¹⁷ Notable publications include *Cultural Competency and Health*,¹⁸ *Immigrant Medicine*¹⁹ and guidelines for refugees from the Australasian Society for Infectious Diseases.²⁰ Many have been designed to address diseases and conditions of public health importance,²⁰⁻²² and some have begun to highlight the importance of psychosocial problems and mental illness, issues of women's health and chronic noninfectious diseases.^{18,23} These guidelines have emerged from a descriptive synthesis of the literature by an expert (or experts) in the field and often in response to particular refugee or migratory movements.¹⁷ Other practice guidelines have grouped domestic minority, ethnic and immigrant populations, developing strategies to improve communication (e.g., interpreters), responsiveness to sociocultural background (e.g., cultural competence), empowerment (e.g., health literacy), monitoring (e.g., health and access disparities) and strategies for comprehensive care delivery.¹⁸ Use of evidence-based methods has yet to affect the field of migration medicine substantially.

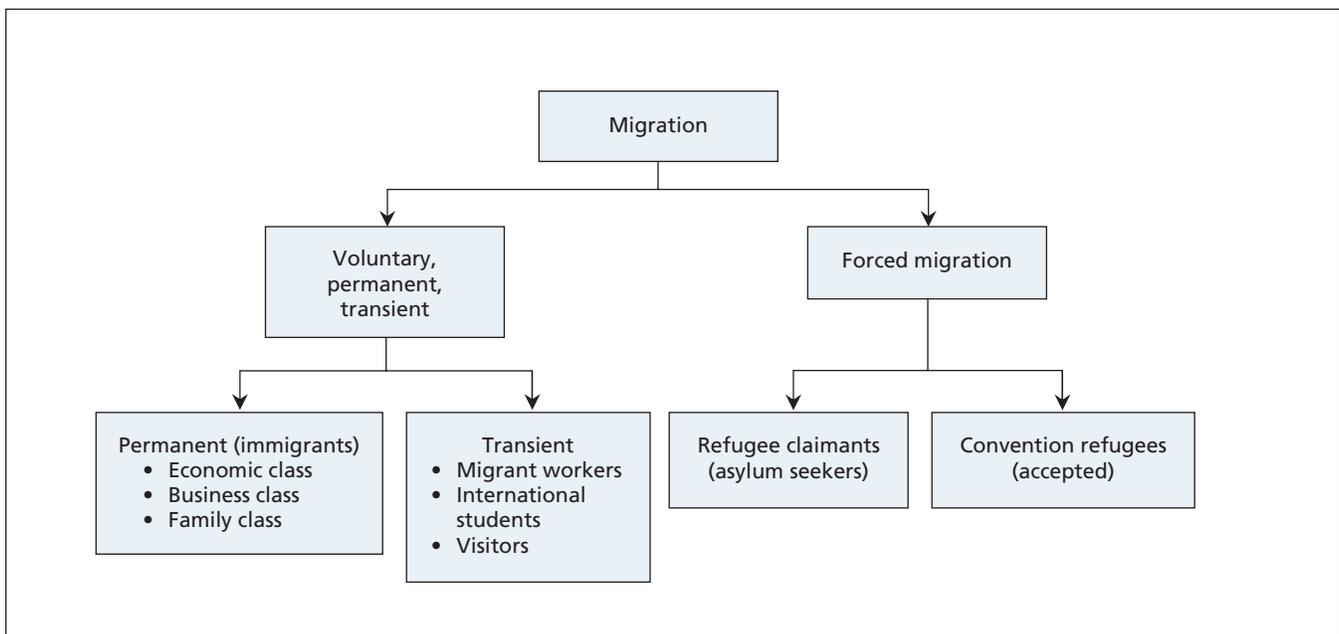


Figure 1: Categories of international migration to Canada.⁴

How are CCIRH guidelines different?

The Canadian Collaboration for Immigrant and Refugee Health (CCIRH) explicitly aims to improve patients' health using an evidence-based clinical preventive approach to complement existing public health approaches. Public health concerns and predeparture migrant screening and treatment protocols were considered, but these were not the driving force for the recommendations. Primary care practitioners selected topics that considered not just burden of illness but also health inequities and gaps in current knowledge.²⁴ We also implemented evidence-based methods, which included searches for immigrant preferences and values and the use of the GRADE approach (Grading of Recommendations Assessment, Development and Evaluation), to formulate clinical preventive recommendations.²⁵ Evidence reviews and recommendations from CCIRH focused on immigrants, refugees and refugee claimants, with special attention to refugees and women and the challenges of integrating recommendations into primary care. Migrants living without official status are particularly vulnerable, but specific evidence on this population is limited.²⁶ The "health settlement period" for this project refers to the first five years of residence in Canada for an immigrant or refugee, the time in which the loss of the healthy immigrant effect begins to surface.

Development

We followed the internationally recognized Appraisal of Guidelines for Research and Evaluation (www.agreecollaboration.org) as a guide for our development process. We

Box 1: CCIRH's 14-step process for evidence reviews²⁵

1. Develop clinician summary table
2. Develop logic model and logic model key questions
3. Set the stage for admissible evidence (search strategy)
4. Assess eligibility of systematic reviews
5. Search for immigrant- and refugee-specific data
6. Refocus on key clinical preventive actions and logic model key questions
7. Assess quality of systematic reviews
8. Update systematic reviews used as references
9. Assess eligibility of new studies
10. Integrate data from search for updates
11. Synthesize final evidence bank, including drafting two key clinical actions
12. Develop summary of findings table
13. Identify gaps in evidence and directions for future research
14. Develop clinical preventive recommendations using GRADE

selected guideline topics using a literature review, stakeholder engagement and the Delphi process using equity-oriented criteria.²⁴ In May 2007, we held a consensus meeting of experts in immigrant and refugee health to develop a systematic process for transparent, reproducible, evidence-based reviews. The guideline committee selected review leaders from across Canada based on clinical and evaluation expertise and a willingness to sign on to a rigorous process of evidence evaluation and guideline development (Appendix 1, available at www.cmaj.ca/cgi/content/full/cmaj.090313/DC1).

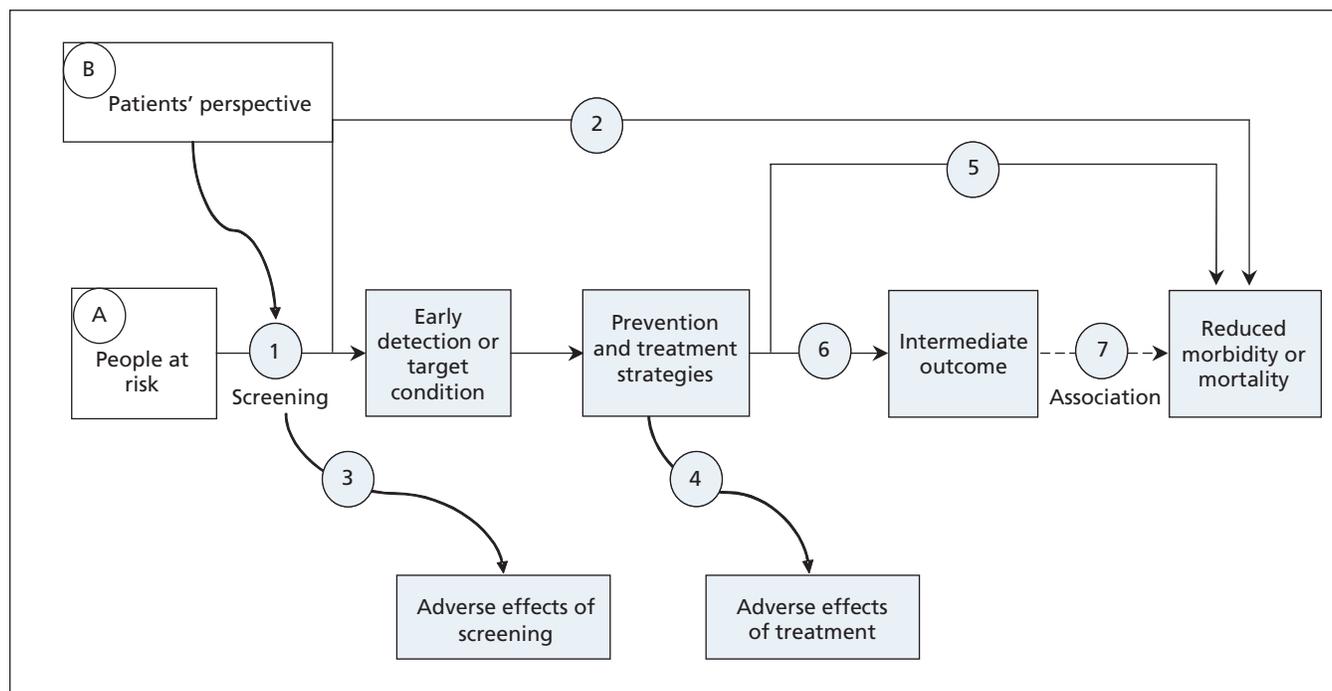


Figure 2: Logic model for evidence review. *Clear rectangles designate the population targeted for screening and their related preferences; shaded rectangles designate interventions and related outcomes, and circles and numbers provide points in the evidence chain that were used to develop the search questions. Adapted from United States Preventive Services Task Force.²⁷

Table 2: Basis of recommendations (adapted from GRADE)²⁵

Issue	Process considerations
Balance between desirable and undesirable effects	Those with net benefits or trade-offs between benefits and harms were eligible for a positive recommendation
Quality of evidence	Quality of evidence was classified as “high,” “moderate,” “low” or “very low” based on methodologic characteristics of available evidence for a specific clinical action
Values and preferences	Values and preferences refer to the worth or importance of health state or consequences relative to following a particular clinical action

GRADE = Grading of Recommendations Assessment, Development and Evaluation.

The 14-step evidence review process (Box 1 and Figure 2)²⁷ used validated tools to appraise the quality of existing systematic reviews, guidelines, randomized trials and other study designs. We identified patient-important outcomes and used the GRADE approach to assess the magnitude of effect on benefits and harms and on quality of evidence. We assessed whether benefits outweighed harms, the quality of evidence, and values and preferences to minimize the potentially negative effects of labelling on patients, families and communities (Table 2).²⁵

Stakeholder engagement

Primary care practitioners selected topics in need of guidelines. Each review team included a topic expert; a primary health care practitioner with expertise in immigrants and refugee health; and pediatricians, gynecologists, nurses, dietitians or community health promoters as needed. A methodologist and medical librarian supported each review team. We sought feedback on our recommendations from selected primary care practitioners and community immigrant health brokers (Edmonton Multicultural Health Brokers Cooperative, representing 16 ethnic communities). Finally, several practitioners pilot-tested the recommendations in primary care practices.

Recommendations

Each of the CCIRH evidence reviews provide detailed methods and results concerning the burden of illness for the immigrants and refugees compared with Canadian-born populations, effectiveness of screening and interventions, and discussion of clinical considerations, basis of recommendations and gaps in research. Table 3²⁸⁻³⁸ (found at the end of this article) summarizes our initial 15 CCIRH recommendations with specific comments on how the number needed to screen and treat for net benefits would differ for immigrant populations.

Clinical considerations

Health risk among immigrants varies greatly with differing exposures (e.g., mosquitoes and other disease vectors, trauma

from war, poor living conditions, including water and sanitation), differing susceptibilities (e.g., ethnicity, comorbidity and migration stress), differing social stratifications (e.g., race, sex, income, education and occupation), differing access to preventive and health services (e.g., limited predeparture access to primary care, immunizations and screening, impaired access to Canadian services associated with shortage of family physicians, and access issues related to linguistic and cultural barriers).

Soliciting migration health histories will help practitioners estimate health risks and determine appropriateness of recommendations. Working with interpreters, patients' families³¹ and community support networks can also improve effectiveness of care. Ongoing research is needed to improve the quality of population-specific evidence of many conditions.

Evidence reviews and recommendations for other topics in immigrant health are forthcoming.

Conclusion and research needs

Immigrant populations are a very heterogeneous group. Although most migrants arrive in good health, some subgroups are at increased risk of rapidly declining health. These subgroups include refugees, women and immigrants with low-income and language barriers. Some immigrant populations have an increased prevalence of some preventable and treatable diseases, diseases that might not be addressed because practitioners are unaware of these health risks and because immigrants are less likely to seek preventive health services. Guidelines were developed by CCIRH using rigorous evidence-based methods. Data remain limited in certain areas, and more work must be done to improve access to health services, but we hope this evidence-based initiative will provide a foundation for improved preventive health care for immigrant populations.

This article has been peer reviewed.

Competing interests: Lavanya Narasiah has received speaker fees for travel health presentations to GlaxoSmithKline. John Feightner has worked for the Public Health Agency of Canada to revitalize the Canadian Task Force on Preventive Health Care. *CMAJ* has received payment from the Public Health Agency of Canada for the publication of this guideline series. The series has been peer reviewed by *CMAJ*. Peter Tugwell, Chair of the *CMA* Journal Oversight Committee, and Noni MacDonald, Section Editor, Population and Public Health, *CMAJ*, are coauthors of this article. They were not involved in the vetting of this article before publication.

Contributors: Each of the authors was a member of the CCIRH Guideline Committee and played an active role in overseeing the guideline development process and in formulating the GRADE recommendations.

Acknowledgements: The authors acknowledge the expert support of Amy Nolen, Leanne Idzerda, Andrea Chambers, Erika Espinoza, Britta Laslo, Maria Benkhalti and Liz Lacasse, Patty Thille, Govinda Dahal, Belinda Smith and Glenda Dare. The authors thank Community Stakeholder Partners Yvonne Chiu and Lucenia Ortiz who provided feedback on behalf of the Edmonton Multicultural Health Brokers Cooperative. The authors thank Lynn Dunikowski and Jessie McGowan for their expert medical librarian support. The authors also thank Holger Schünemann, Nancy Santesso, Andy Oxman and Gordon Guyatt for their help with GRADE methods and presentation of findings.

Funding: The Canadian Collaboration for Immigrant and Refugee Health acknowledges the funding support of the Public Health Agency of Canada,

the Canadian Institutes of Health Research (Institute of Health Services and Policy Research), the Champlain Local Health Integrated Network and the Calgary Refugee Program. The views expressed in this report are the views of the authors and do not necessarily reflect those of the funders. Travel and accommodations for the Ottawa Expert Panel Conference were funded by the Public Health Agency of Canada. The Public Health Agency of Canada funded background papers in chronic diseases and mental illness. The Calgary Refugee Program, Champlain Local Integrated Network and Canadian Institutes of Health Research (Canadian Institute of Health Services and Policy Research) contributed to dissemination of the guidelines.

REFERENCES

- International Organization for Migration Report. *The world migration report 2008*. Geneva (Switzerland): The Organization; 2008.
- MacPherson DW, Gushulak BD, Macdonald L. Health and foreign policy: influences of migration and population mobility. *Bull World Health Organ* 2007; 85:200-6.
- Overcoming barriers: human mobility and development*. 2009. New York (NY): Human Development Reports; 2009. Available: <http://hdr.undp.org/en/reports/global/hdr2009/chapters/> (accessed 2010 May 25).
- Gushulak BD, Pottie K, Hatcher Roberts J, et al. Migration and health in Canada: health in the global village. *CMAJ*. In press.
- Hyman I. *Immigration and health: reviewing evidence of the healthy immigrant effect in Canada*. CERIS Working Paper No. 55. Toronto (ON): Joint Centre of Excellence for Research on Immigration and Settlement; 2007.
- Ng E, Wilkins R, Gendron F, et al. *Dynamics of immigrants' health in Canada: evidence from the National Population Health Survey*. Ottawa (ON): Statistics Canada; 2005.
- Newbold KB, Danforth J. Health status and Canada's immigrant population. *Soc Sci Med* 2003;57:1981-95.
- Dunn JR, Dyck I. Social determinants of health in Canada's immigrant population: results from the National Population Health Survey. *Soc Sci Med* 2000;51:1573-93.
- McDonald JT, Kennedy S. Insights into the 'healthy immigrant effect': health status and health service use of immigrants to Canada. *Soc Sci Med* 2004;59:1613-27.
- Pottie K, Ng E, Spitzer D, et al. Language proficiency, gender and self-reported health: an analysis of the first two waves of the Longitudinal Survey of Immigrants to Canada. *Can J Public Health* 2008;99:505-10.
- Wilkins R, Tjepkema M, Mustar C, et al. The Canadian census mortality follow-up study, 1991 through 2001. *Health Rep* 2008;19:25-43.
- DesMeules M, Gold J, McDermott S, et al. Disparities in mortality patterns among Canadian immigrants and refugees, 1980-1998: results of a national cohort study. *J Immigr Health* 2005;7:221-32.
- Steele LS, Lemieux C, Clark J, et al. The impact of policy changes on the health of recent immigrants and refugees in the inner city. *Can J Public Health* 2002; 93:118-22.
- Closing the gap in a generation: health equity through action on the social determinants of health. Final report of the Commission on Social Determinants of Health*. Geneva (Switzerland): World Health Organization; 2008. Available: www.who.int/social_determinants/en/ (accessed 2010 May 20).
- Beach MC, Gary T, Price E, et al. Improving health care quality for racial/ethnic minorities: a systematic review of the best evidence regarding provider and organization interventions. *BMC Public Health* 2006;6:104.
- Pottie K, Torres S. *Systematic review for guidelines for immigrants and refugees: policy report for the Public Health Agency of Canada*. Ottawa (ON): Canadian Collaboration for Immigrant and Refugee Health; 2005. Available: www.ccirh.uottawa.ca/eng/index.html (accessed 2010 May 31).
- Gushulak BD, MacPherson DW. *Migration medicine and health: principles and practice*. Hamilton (ON): BC Decker; 2006.
- National Health and Research Council AG. *Cultural competency in health: a guide for policy, partnerships and participation*. Canberra (Australia): The Council; 2005.
- Walker PF, Barnett ED, Stauffer WM, editors. *Immigrant medicine*. Philadelphia (PA): Saunders Elsevier; 2007.
- Australasian Society for Infectious Diseases. *Draft guidelines for diagnosis, management and prevention of infection in recently arrived refugees*. Sydney (Australia): The Society; 2007.
- Barnett ED. Infectious disease screening for refugees resettled in the United States. *Clin Infect Dis* 2004;39:833-41.
- Stauffer WM, Karnat D, Walker PF. Screening of international immigrants, refugees, and adoptees. *Prim Care* 2002;29:879-905.
- Gavagan T, Brodyaga L. Medical care for immigrants and refugees. *Am Fam Physician* 1998;57:1061-8.
- Swinkels H, Pottie K, Tugwell P, et al. Selecting preventable and treatable conditions for guideline development for recently arrived immigrants and refugees to Canada: Delphi Consensus. *CMAJ*. In press.
- Tugwell P, Pottie K, Welch V, et al. Evaluation of evidence based literature and formulation of recommendations for Clinical Preventative Guidelines for Immigrants and Refugees in Canada. *CMAJ*. In press.
- San Martin C, Ross N. Experiencing difficulties accessing first-contact health services in Canada. *Healthc Policy* 2006;1:103-19.
- Agency for Healthcare Research and Quality. *Procedure manual*. Publication No. 08-05118-EF. Washington (DC): US Department of Health and Human Services; 2008. Available: www.ahrq.gov/clinic/uspstf08/methods/procmannual.htm (accessed 2010 May 26).
- Greenaway C, Narasiah L, Plourde P, et al. Hepatitis B: evidence review for newly arriving immigrants and refugees. *CMAJ*. In press.
- Pottie K, Vissandjee B, Grant J, et al. Human immunodeficiency virus: evidence review for newly arriving immigrants and refugees. *CMAJ*. In press.
- Greenaway C, Sandoe A, Vissandjee B, et al. Tuberculosis: evidence review for newly arriving immigrants and refugees. *CMAJ*. In press.
- Kirmayer LJ, Narasiah L, Ryder A, et al. Depression: evidence review for newly arriving immigrants and refugees. *CMAJ*. In press.
- Pottie K, Chambers A, Brockest B, et al. Iron-deficiency anemia: evidence review for newly arriving immigrants and refugees. *CMAJ*. In press.
- McNally M, Matthews D, Pottie K, et al. Common oral conditions (dental caries and periodontal disease): evidence review for newly arriving immigrants and refugees. *CMAJ*. In press.
- Buhrman R, Toren A, Hodge W, et al. Vision health: evidence review for newly arriving immigrants and refugees to Canada. *CMAJ*. In press.
- Dunn S, Janakiram P, Blake J. Contraception: evidence review and clinical guide for care of newly arrived immigrants and refugees. *CMAJ*. In press.
- Pottie K, Nolen A, Topp P, et al. Cervical cancer: evidence review for newly arriving immigrants and refugees. *CMAJ*. In press.
- Gagnon A, Rousseau H, Welt M, et al. Screening during pregnancy: evidence review for newly arriving immigrants and refugees. *CMAJ*. In press.
- McAlister FA. The "number needed to treat" turns 20 — and continues to be used and misused. *CMAJ* 2008;179:549.

Correspondence to: Dr. Kevin Pottie, Department of Family Medicine, University of Ottawa, 75 Bruyere St., Ottawa ON K1N 5C8; kpottie@uottawa.ca

Clinical preventive guidelines for newly arrived immigrants and refugees to Canada

This article is part of a series of guidelines for primary care practitioners who work with immigrants and refugees. The series was developed by the Canadian Collaboration for Immigrant and Refugee Health.

Table 3 appears on next page.

Table 3: Canadian Collaboration for Immigrant and Refugee Health: Phase I recommendations (part 1 of 7)

Category	Recommendation	Basis of recommendation			Clinical considerations
		Balance of benefits and harms	Quality of evidence	Values and preferences	
Infectious diseases					
Hepatitis B ²⁸	Screen adults and children from countries where hepatitis B is prevalent ($\geq 2\%$ hepatitis BsAg positive) for chronic infection with hepatitis B (HBsAg) to both decrease disease severity and incidence of hepatocellular carcinoma, and to decrease transmission of hepatitis B infection. In those found to have chronic hepatitis B infection, refer for evaluation and assessment for the need for treatment and screen risk groups for hepatocellular carcinoma. Life long monitoring is required.	Screening and then treating advanced chronic hepatitis B infection reduces the development of progressive liver failure NNT 19 (confidence interval [CI] 15–44). Screening for hepatocellular carcinoma (six monthly ultrasounds \pm α FP serologic testing) in certain risk groups with chronic hepatitis B infection decreases the risk of mortality from hepatocellular carcinoma (NNS 2058; CI 1462–4412). There is a higher prevalence of chronic hepatitis B for immigrants and refugees, ranging from 1%–10% compared with < 0.5% for North Americans. Toxicity varies by treatment regimen, but most therapies are well tolerated.	Moderate	The Guideline Committee attributed more value to preventing death due to hepatocellular carcinoma and less value on the burden of screening and treatment side effects.	Countries where chronic hepatitis B is prevalent (> 2%) are found in Africa, Asia and Eastern Europe. Treatment of chronic hepatitis B infection is complex and rapidly evolving; thus, patients with positive results should be referred to an expert in treating hepatitis B infection. Certain people with chronic hepatitis B are at increased risk of hepatocellular carcinoma (those with cirrhosis, Asian men > 40 years of age, Asian women > 50 years of age, Africans > 20 years of age and those with a family history of hepatocellular carcinoma), and these people will benefit from ultrasonography and α FP serologic testing every six months to detect hepatocellular carcinoma at an earlier stage that is more amenable to therapeutic intervention.
Hepatitis B vaccination ²⁸	Screen adults and children from countries where hepatitis B is prevalent ($\geq 2\%$), hepatitis BsAg positive) for prior immunity to hepatitis B (anti-HBc, anti-HBs) and vaccinate those found to be susceptible (negative for all three markers of HBsAg, anti-HBc and anti-HBs) to decrease morbidity and mortality and transmission of hepatitis B.	Universal perinatal and childhood vaccination in hepatitis-B-endemic countries has resulted in dramatic reductions in chronic hepatitis B infection (NNV 12; CI 11–12) as well as decreased mortality due to hepatocellular carcinoma (NNV 217 391; CI 174 825–340 599) after 15 years of institution. In countries with lower prevalence of hepatitis B, vaccination of adults decreases development of acute hepatitis B infection. Side effects of vaccination are minor and self-limited.	Moderate	The Guideline Committee attributed more value to reducing disparity of chronic hepatitis B infection, a preventable and high-burden disease, and more value on protecting family and friends than on the burden of screening and vaccination.	A large proportion (20%–80%) of immigrants from countries where chronic hepatitis B is prevalent is nonimmune and thus at risk for hepatitis B infection if exposed. Immigrants are more likely to be exposed to hepatitis B virus in their households and during travel to countries where hepatitis B is prevalent and would therefore benefit from vaccination.

Table 3: Canadian Collaboration for Immigrant and Refugee Health: Phase I recommendations (part 2 of 7)

Category	Basis of recommendation			
	Recommendation	Balance of benefits and harms	Quality of evidence	Values and preferences
HIV ²⁹	<p>Screen for HIV, with informed consent, all adolescents and adults from countries where HIV is prevalent (> 1%) to reduce morbidity and mortality. Link HIV-positive people to HIV treatment programs in association with post-test counselling.</p>	<p>The decision to screen men and women for HIV is based on a dramatic reduction in mortality with treatment with a combination of 3 v. 2 antiretrovirals (NNT = 132; CI 91–357) and reduction of high-risk behaviours (NNT 5; CI 4–7). There is a higher prevalence of HIV infection in immigrants from countries where HIV is prevalent (> 1%) compared with Canadians (< 0.6%). Harms included adverse drug reactions, requiring change in regimen.</p> <p>Data on harms related to anxiety and possible discrimination related to HIV status are not available.</p>	Moderate	<p>The Guideline Committee attributed more value to identifying HIV-positive women and men for appropriate treatment, support and prevention, less value on uncertain risk of couple discord and risk of discrimination, and less concern for burden of testing with informed consent process.</p>
TB ³⁰	<p>Children</p> <p>Screen children and adolescents ≤ 20 years of age from countries with high incidence of tuberculosis (smear positive pulmonary TB ≥ 15/100 000 population) as soon as possible after their arrival in Canada with a tuberculin skin test; recommend treatment for latent TB infection if found to be positive, after ruling out active TB.</p> <p>Adults</p> <p>Screen all refugees from countries with a high incidence of TB between the ages of 21 and 50 years as soon as possible after their arrival in Canada with a tuberculin skin test. Screen all other adult immigrants if they</p>	<p>The decision of whom to screen and offer treatment for latent TB is based on the balance between the potential benefit of treatment (the life-time risk of infection, influenced by age, the presence of medical conditions that increase the risk of development of active TB and immigration category), versus the potential harms of hepatotoxicity (that increases with age) and the poor effectiveness of INH in many settings due to suboptimal uptake of screening and treatment.</p> <p>The groups in whom screening for latent TB should be routinely performed and those found positive should be offered treatment are children from countries with a high incidence of TB (†NNT 20–26;</p>	High	<p>Countries where HIV is prevalent (> 1%) include those in Sub-Saharan Africa, Caribbean and Thailand. See World prevalence map: http://gamapserver.who.int/mapLibrary/Files/Maps/Global_HIVprevalence_2007.png.</p> <p>Immigrants and refugees may already be aware of their HIV-positive status but may have limited knowledge of effective screening and treatment options.</p> <p>HIV-related stigma and discrimination puts immigrants and refugees at risk for delayed diagnosis and unequal treatment rates for HIV.</p> <p>Providing information on the process of testing and the effectiveness of treatments can improve likelihood of testing and acceptance of treatment. Some people may be interested in anonymous or nominal testing.</p>
	<p>Adults</p> <p>Screen all refugees from countries with a high incidence of TB between the ages of 21 and 50 years as soon as possible after their arrival in Canada with a tuberculin skin test. Screen all other adult immigrants if they</p>	<p>The decision of whom to screen and offer treatment for latent TB is based on the balance between the potential benefit of treatment (the life-time risk of infection, influenced by age, the presence of medical conditions that increase the risk of development of active TB and immigration category), versus the potential harms of hepatotoxicity (that increases with age) and the poor effectiveness of INH in many settings due to suboptimal uptake of screening and treatment.</p> <p>The groups in whom screening for latent TB should be routinely performed and those found positive should be offered treatment are children from countries with a high incidence of TB (†NNT 20–26;</p>	High	<p>Countries with a high incidence of TB include those in Sub-Saharan Africa, Asia, Central and South America and some in Eastern Europe.</p> <p>In people found to have a positive tuberculin skin test chest radiography should be performed to rule out active TB.</p> <p>Symptoms (fever, weight loss, fatigue and night sweats) and signs (fever, wasting, lymphadenopathy, abnormal chest sounds) of active TB should be sought. If active TB is suspected, appropriate investigations should be performed.</p> <p>Special attention should be given to screening infants and young children (< 5 years) for latent TB because, if infected, they are at high risk of active TB, which is more difficult to diagnose in this population.</p> <p>Medical conditions that increase risk for TB include HIV, organ transplantation, recent contact with a patient with active</p>

Table 3: Canadian Collaboration for Immigrant and Refugee Health: Phase I recommendations (part 3 of 7)

Category	Basis of recommendation			
	Recommendation	Balance of benefits and harms	Quality of evidence	Values and preferences
TB ³⁰ (continued)	<p>have factors that increase the risk of active TB with a tuberculin skin test and recommend treatment for latent TB infection in those found to be positive, after ruling out active TB.</p>	<p>tNNH 134–268), adults with risk factors for active TB (†NNT 3–20; †NNH variable) and refugees < 50 years of age (†NNT 14–26; †NNH 54). Screening for latent TB and offering treatment could also be considered for adult refugees 50–65 years of age (†NNT 26–53; †NNH 9–18) and other adults without underlying medical conditions < 65 years of age if treatment adherence could be ensured and hepatotoxicity carefully monitored to minimize harms. A decision to screen is a decision to offer treatment and to ensure treatment adherence with appropriate counselling and monitoring.</p>		<p>TB, hematologic malignancy, fibronodular scarring on chest radiograph, chronic glucocorticoid treatment, diabetes and chronic renal failure. To promote patients' safety and adherence, patients must be informed of the risks and benefits of treatment in a culturally and linguistically appropriate manner.</p>
Mental health and noncommunicable chronic diseases				
Depression ³¹	<p>If linked to an integrated treatment program, screen adults for depression with a systematic clinical enquiry or validated questionnaire (PHQ-9 or equivalent) to decrease rate of depression. Link patients with suspected depression with integrated treatment program and case management or mental health care.</p>	<p>The NNT to prevent one person with persistent depression was 18 (95% CI 10–91) in studies of 1–12 months' duration. Depression treatment in enhanced depression-care models accounts for an additional 1%–2% reduction in depressive symptoms compared with usual care. There is a similar prevalence of depression in Canadians and immigrants and refugees (10.7%), but access to care may be an issue for immigrant populations. There were no data reported on harms, which include patient out-of-pocket costs.</p>	Moderate	<p>The Guideline Committee attributed more value to screening and treating depression to improve quality of life and less value to concerns for impairing rapport in therapeutic relationship and cultural acceptability, the cost and inconvenience of additional follow-up assessments, and possible adverse effects or costs associated with treating patients with incorrect diagnosis.</p>
				<p>If people are not routinely screened as part of an integrated system of care, practitioners should remain vigilant for signs of depression. The majority of people with major depression present primarily with somatic symptoms, most frequently pain, fatigue or other nonspecific symptoms. Among refugees, depression commonly occurs with post-traumatic stress disorder and other anxiety disorders, which complicates the detection and treatment of depression. Conduct systematic clinical enquiry or validated questionnaire in a language in which the patient is fluent. Link patients with suspected depression to integrated treatment programs and follow-up with a stepped care approach. Effective detection and treatment of depression among immigrants and refugees may also require the use of interpreters or culture-brokers to identify patient concerns, negotiate illness meanings, monitor progress, ensure adherence, and address social causes and consequences of depression.</p>

Table 3: Canadian Collaboration for Immigrant and Refugee Health: Phase I recommendations (part 4 of 7)

Category	Basis of recommendation				
	Recommendation	Balance of benefits and harms	Quality of evidence	Values and preferences	Clinical considerations
Iron deficiency anemia ³²	<p><i>Children</i></p> <p>Screen for iron deficiency in children aged 1–4 years (with hemoglobin) to improve cognitive development. If iron deficient, recommend iron supplementation.</p>	<p>Treating children with iron deficiency anemia improves cognitive development, with standardized mean difference of 0.30: equivalent to modest effect of 1.5–2.0 intelligence quotient points (NNT 7; CI 5–14).</p> <p>There is a higher prevalence of iron deficiency anemia in immigrant and refugee children (> 20%) compared with Canadian children (< 20%).</p> <p>Side effects from iron treatment were minimal.</p>	Moderate	<p>The Guideline Committee attributed more value to ensuring optimal opportunities for immigrant children and potential education/literacy/wage disparities between immigrants and Canadians and less value to discomfort of testing and risk of diarrhea from treatment.</p>	<p>Growing children are at risk for iron deficiency and related morbidity. Iron deficiency in children is often caused by a combination of inadequate diet, low iron stores at birth and frequent infections, leading to anorexia and poor food intake.</p> <p>Investigate abnormal haemoglobin levels; verify iron stores (ferritin) and investigate other causes of anemia if clinically indicated (blood smear, hemoglobin electrophoresis; glucose 6 phosphate deficiency test; chronic infections and other nutritional deficiencies).</p> <p>Recheck hemoglobin levels for response to iron after one month.</p>
Oral health ³³	<p>Screen for dental pain (asking, “Do you have any problems or pain with your mouth, teeth or dentures?”) to reduce pain. Treat dental pain with nonsteroidal anti-inflammatory drugs and refer the patient to a dentist.</p> <p>Screen for obvious dental caries and oral disease in children and adults (mouth exam with penlight and tongue depressor) to reduce oral-related morbidity.</p> <p>Refer obvious dental disease to dentist or oral health specialist.</p>	<p>Screening and treating dental pain leads to a significant decrease in pain and swelling (NNT 34; CI not estimable).</p> <p>Screening and referring for treatment for dental disease led to a significant decrease in dental caries (NNT 2.9; CI 2.1–3.4).</p> <p>There is a higher prevalence of dental caries in new immigrant adolescents (23.0% v. 3.5% in Canadians); however, there are potential issues related to access to dental care.</p> <p>Harms for pain control were minimal and included short-term adverse events from nonsteroidal anti-inflammatory drugs. Harms for referral included patient-borne costs and discomfort/anxiety.</p>	Moderate	<p>The Guideline Committee attributed more value to reducing dental pain and less value to small risk of gastrointestinal side effects with nonsteroidal anti-inflammatory drug therapy.</p> <p>For referrals, the Guideline Committee attributed more value to reducing oral health disparities in immigrant communities and less value on burden of screening and potential costs of dental care for the person.</p>	

Table 3: Canadian Collaboration for Immigrant and Refugee Health: Phase I recommendations (part 5 of 7)

Category	Basis of recommendation				Clinical considerations
	Recommendation	Balance of benefits and harms	Quality of evidence	Values and preferences	
Vision health ³⁴	<p>Age-appropriate screening for visual impairment and correction with spectacles to reduce associated functional limitation and morbidity.</p> <p>If presenting vision < 6/12 (with habitual correction in place) refer the patient to an optometrist or ophthalmologist for comprehensive ophthalmic evaluation.</p>	<p>Uncorrected refractive error, the most common cause of visual impairment, is amenable to correction with spectacles (NNS to find one person with vision worse than 6/15 or 20/50 due to uncorrected refractive error = 19).</p> <p>There is a higher prevalence of uncorrected refractive errors in immigrant populations; however, economic and cultural barriers could diminish uptake of referral and the need for spectacles.</p> <p>Harms are minimal and may include out-of-pocket costs.</p>	Very low	<p>The Guideline Committee attributed more value to the importance of ensuring adequate visual acuity for daily functioning and employment and detecting serious underlying ocular disease, and less value to the burden of screening and the cost of spectacles.</p>	<p>Even modest visual impairment (visual acuity < 6/12) is associated with significant morbidity.</p> <p>Special considerations exist for doing vision screening of children < 8 years of age.</p> <p>Referral for assessment is also warranted for other risk factors for blinding eye disease, including diabetes, age > 65 years, blacks > 40 years, glaucoma in a first-degree relative and myopia exceeding -6 diopters.</p>
Women's health					
Contraception ³⁵	<p>Screen women of reproductive age for unmet contraceptive needs and provide culturally sensitive, patient-centred contraceptive counselling to decrease unintended pregnancy and promote patient satisfaction.</p>	<p>Contraceptive counselling led to improved patient satisfaction (NNT 3; CI 2-5) and continuation rates (NNT 4; CI 3-7). Evidence that in-depth counselling reduces unintended pregnancy rates shows some uncertainty (RR 0.47; CI 0.16-1.34); however, the Guideline Committee judged that contraceptive continuation rates are an acceptable surrogate for unintended pregnancy rates.</p> <p>There is a high prevalence of unmet need for contraception in immigrant and refugee women (7%-37%).</p> <p>Minimal harms were reported. There were no data available on couple or family discord.</p>	Moderate	<p>The Guideline Committee attributed more value to supporting informed choice to meet future family needs and personal needs of the woman (empowerment) and less value on concerns about causing couple and family discord.</p>	<p>Screening should begin soon after a woman's arrival in Canada. An unmet need for contraception is highly prevalent worldwide. Women from developing countries are often unaware of emergency contraception.</p> <p>Acceptability of contraception and method preferences vary across world regions and should be considered in counselling (e.g., intrauterine devices are predominant in Latin American and Caribbean). In some communities, condoms may have connotations of infidelity, promiscuity or sexually transmitted infection, or are used only with nonmarital partners.</p> <p>Giving women their method of choice, providing the contraceptive method on site, and having a good interpersonal relationship improve contraceptive-related outcomes.</p>

Table 3: Canadian Collaboration for Immigrant and Refugee Health: Phase I recommendations (part 6 of 7)

Category	Basis of recommendation			
	Recommendation	Balance of benefits and harms	Quality of evidence	Values and preferences
Cervical cancer ²⁶	Vaccination against HPV: recommend vaccination against HPV to 9–26-year-old females to reduce invasive changes related to cervical cancer.	HPV vaccination prevented invasive changes related to cervical cancer (NNT 139; CI 117–180) in studies with a 15- to 48-month duration. There is impaired accessibility to cytology screening in immigrant women and a higher prevalence of HPV infection in developing countries. Harms included treatable anaphylaxis in less than 1 in 100 000 doses.	Moderate	The Guideline Committee attributed more value to preventing cervical cancer and less value to current absence of long-term data on mortality.
Cervical cytology ²⁶	Screen sexually active women for cervical abnormalities (Pap test) to detect and treat invasive changes to reduce morbidity and mortality.	Identifying and treating early cervical cancer reduces mortality. The NNS to prevent one death from cervical cancer is 3497 (CI 2361–90 909). There is a significantly lower rate of cytology screening in immigrant women (40%–60%) compared with Canadian women (60%–80%). Harms are minimal and depend on the course of therapy.	Low	The Guideline Committee attributed more value to preventing cervical cancer and less value to uncertainty of size of effect and burden of screening on health services.
Iron deficiency anemia ³²	<i>Women</i> Screen for iron deficiency anemia (with hemoglobin) in immigrant and refugee women of reproductive age to improve hemoglobin levels and work productivity. If the woman is iron deficient, recommend iron supplementation.	Treating iron deficiency anemia provides an average net change in hemoglobin level of 15 g/L (NNT 2; CI 2–3), an increase in function and a net change in the productivity ratio (NNT 4; CI 3–8). The prevalence of iron deficiency is higher in immigrant women (> 15%) compared with Canadian women (< 15%). Harms were minimal and include diarrhea and personal costs of iron supplements.	Moderate	Immigrant and refugee women are at higher risk for iron deficiency anemia primarily because of high parity, some low-iron diets and parasitic infections. Investigate abnormal haemoglobin levels; verify iron stores (ferritin) and investigate other causes of anemia if clinically indicated (blood smear, hemoglobin electrophoresis; G6PD test, chronic infections and other nutritional deficiencies). Recheck hemoglobin levels for response to iron supplements after one month.
				HPV infection is strongly associated with cervical cancer. HPV is common (66% life-time prevalence of oncogenic strain of HPV) and can be acquired even if it is the first relationship involving sexual intercourse for both people. School immunization programs vary by province; immigrant girls and women may miss school vaccination programs depending on their age at the time of arrival. As with all injectable vaccines, appropriate medical treatment should be readily available for uncommon anaphylactic reactions. Subgroups of immigrant and refugee women have lower rates of cervical cytology screening. Women who have never had cervical screening or have not had cervical screening in the previous five years account for 60%–90% of invasive cervical cancers. Providing information to patients, building rapport and offering access to female practitioners can improve acceptance of Pap testing. Lack of proficiency with the official language as well as difficulties with child care and transportation are associated with lower screening rates. Organized screening systems, including call/recall, improve screening rates and may be possible to implement at the clinic or provincial level.

Table 3: Canadian Collaboration for Immigrant and Refugee Health: Phase I recommendations (part 7 of 7)

Category	Basis of recommendation			
	Recommendation	Balance of benefits and harms	Quality of evidence	Values and preferences
Pregnancy ³⁷	Research recommendation to develop and study interventions for social isolation for pregnant immigrants and refugees given the risk for maternal morbidity and infants small for their gestational age.	<p>Pregnant immigrant and refugee women face higher risks of social isolation (15%) than Canadian women (7.5%), which is associated with maternal morbidity and infants small for their gestational age.</p> <p>However, no intervention evidence was available, and there is a risk of causing harm with social interventions when no evidence exists to show it works.</p> <p>Therefore, the Guideline Committee supports a research recommendation to develop and study interventions for pregnant women and social isolation.</p>	Low, no intervention evidence available.	<p>The Guideline Committee attributed more value to preventing uncertain harms than to providing uncertain benefits in unstudied interventions.</p>
				<p>Clinical considerations</p> <p>Reports suggest that some newly arrived pregnant women are at increased risk for maternal mortality.</p> <p>Although no clinical action recommendation is made to address social isolation, pregnant women may benefit from established antenatal screening for diabetes, depression, HIV, hepatitis B, hepatitis C, syphilis, iron deficiency, hemoglobinopathies, rubella and varicella susceptibility.</p> <p>Remaining alert for risks of unprotected/ unregulated work environments and sexual abuse (specifically in forced migrants) may also be beneficial.</p>

Note: α FP = alpha-fetoprotein, CI = confidence interval, HIV = human immunodeficiency virus, HPV = human papilloma virus, INH = isoniazid, NNH = number needed to harm, NNS = number needed to screen, NNT = number needed to treat, NNV = number needed to vaccinate, RR = relative risk, TB = tuberculosis.

*Recommendations for screening were developed when there was a reliable screening tool or if the screening method was considered clinically feasible (e.g., identifying dental pain or unmet contraception needs). Absolute effects (e.g., NNT) are a comparison of event rates between two treatment options that can also be influenced by baseline risk, time frame and outcomes.²⁸ Clinical considerations highlight relevant medical and implementation issues.

†Estimated NNT and NNH are based on the following assumptions: seven years after arrival the annual risk of developing active TB is 0.1%, the relative risk of infection in the first six years after arrival is higher but decreases (RR 5.1–1.4), the person will live to age 80 years, the efficacy of INH is 90% (in those taking > 80% of doses) and compliance is 70%.