

Infectious Diseases among Immigrants

What is the Evidence and What are the Gaps?

Dr. Christina Greenaway

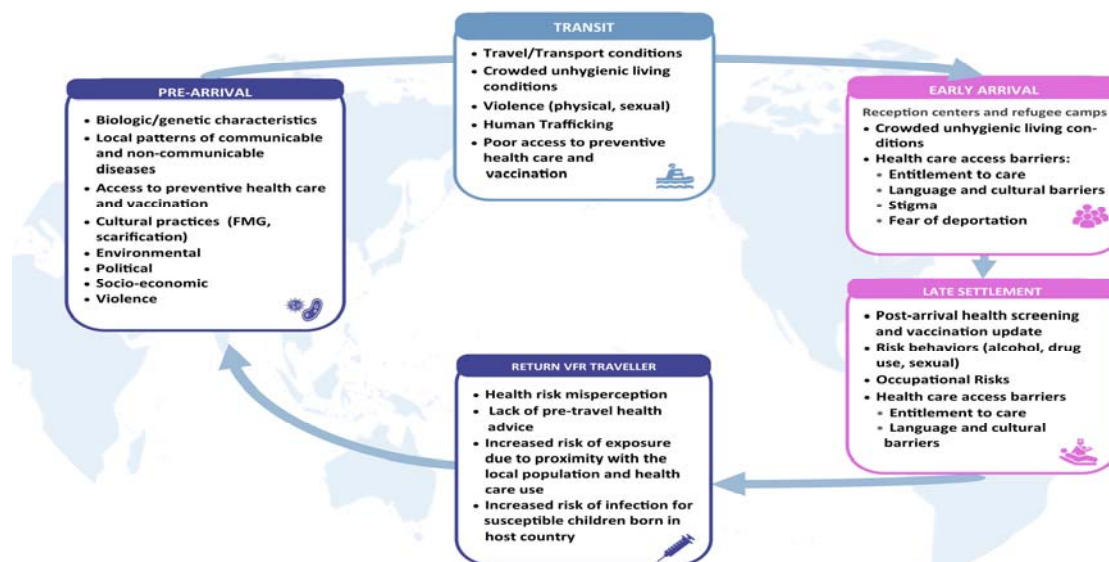
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Journées annuelles de santé publique (JASP), Montréal le 27 novembre, 2019

Objectives

- Review the burden of high prevalence infectious diseases among immigrants
 - Tuberculosis
 - Viral Hepatitis (hepatitis B and C)
 - HIV
 - Vaccine Preventable Diseases
- Discuss the gaps in screening, linkage to care and treatment for these conditions

Migration as a Health Determinant



FGM: Female genital mutilation; VFR: Traveller visiting friends and relatives.

Greenaway & Castelli 2019. J Trav Med doi:10.1093/jtm/taz007

Infectious Disease Health Disparities among Immigrants in Canada

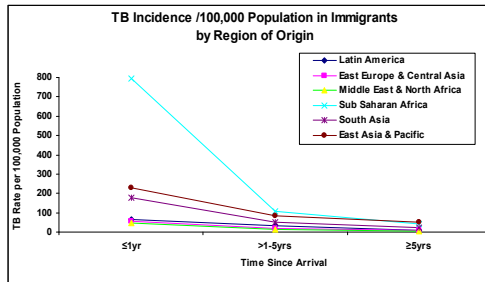
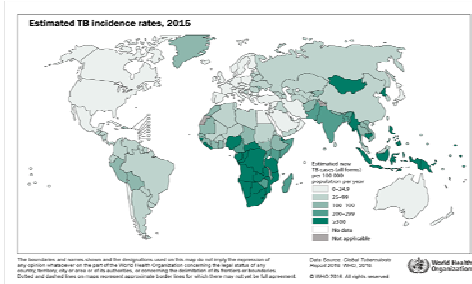
Disease	Rate/100,000	Cases/year	Proportions in migrants
Tuberculosis (TB) ¹	4.9	1796	72%
Acute Hepatitis B Virus ²	0.53	187	<5%
Chronic Hepatitis B Virus ²	11.8	4196	~50%
Hepatitis C Virus ²	31.1	11265	~30%
HIV ¹	6.5	2402	11.5%
Measles ³	0.03	11 ¹ , 45 ² , 29 ³	
Rubella ³	<0.03	0-10*	
Varicella (2014)	37	2793	8.7%, 24%

¹ 2017, ² 2016, ³ 2018

*1 CRS in 2018

LaFreniere 2019. Tuberculosis in Canada: 2017; Haddad 2018. CCDR HIV in Canada-Surveillance Report, 2017, PHAC, 2019; CCDR Report on Hepatitis B and C in Canada 2016, PHAC. Measles Surveillance in Canada 2016. 2017. PHAC. Measles & Rubella Weekly Monitoring Report – Week 52: December 23 to December 29, 2018. 2018;

Epidemiology of Tuberculosis in Immigrants



- Immigrants account for >70% of TB cases in Canada
- Risk 15-300 fold higher than host population: varies by region of origin, time since arrival and immigration class
- Risk remains elevated over lifetime
- Refugees 2-fold higher risk vs. immigrants
- Up to 30% have latent infection

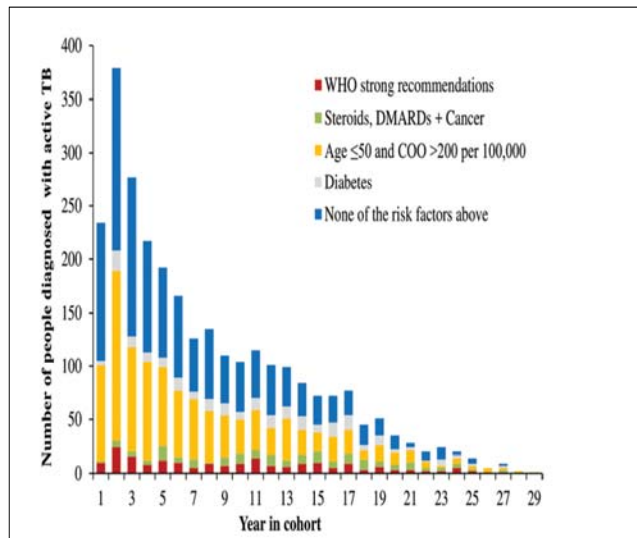
Greenway CMAJ 2011 DOI:10.1503/cmaj.090302; Ronald CMAJ 2018;190:E209-16

Pre-Arrival TB Screening and Post-Landing TB Surveillance(PLS) among Canadian immigrants

Screening program	Type of screening	Groups Screened	Objective	Detection
Pre-immigration Screening	CXR Smear and sputum culture if abnormal CXR	Immigrants, Refugees Some Students, Temporary Workers	Detect active prevalent TB	Active TB 0.09% Abnormal CXR ~6%
Post-Arrival surveillance (PLS)	CXR TST/IGRA	Only 2.4% of all immigrants go on PLS	Detect active prevalent TB Detect LTBI and offer treatment	Active TB 0.96%
LOW IMPACT OF PLS Detects 2.6% of all TB cases Transmission to 4% TB cases LTBI to PLS prevents 4.9% TB cases		High risk for TB reactivation (prior treated TB or abnormal CXR)		

Khan 2015 CMAJ;187(6):E473-83; Asadi Lancet Pub Health 2017;2:e450-57; Campbell 2017 PLoSOne doi.org/10.1371/journal.pone.0186778

Latent TB Screening Immigrants



- Need to scale up LTBI screening
- LTBI Rx of those with WHO Strong Risk Factors (contacts, HIV, TNF, transplant, silicosis) only detect **4.2%**
- Screening those with additional risk factors prevented **59.5%** of cases
- Adding LTBI to pre-landing exam for high to intermediate incidence with post arrival rifampin **cost-effective**
- Decrease **46%** of cases

Khan 2015 CMAJ;187(6):E473-83; Asadi Lancet Pub Health 2017;2:e450-57; Campbell Emerg Inf Dis 2019;25(4):661-671

Weak Latent TB Care Cascade: Strengthened by patient centered culturally-linguistically adapted programs

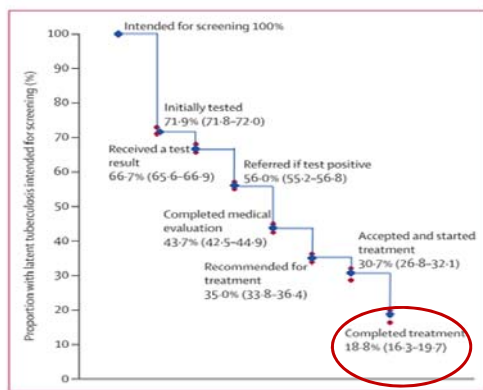


Figure 2: Losses and drop-outs at each stage of the cascade of care in latent tuberculosis

Alsdurf. Lancet Inf Dis Aug 10, 2016 s1473-3099 099;

Research Article

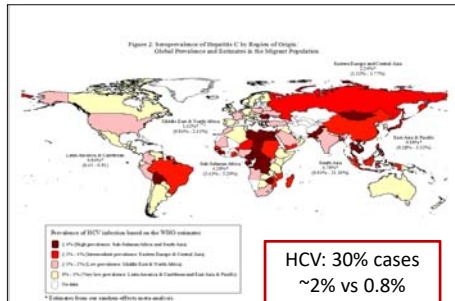
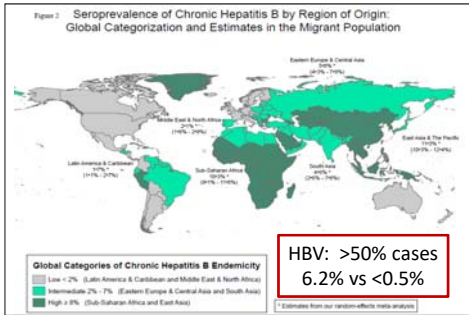
A Step toward Tuberculosis Elimination in a Low-Incidence Country: Successful Diagnosis and Treatment of Latent Tuberculosis Infection in a Refugee Clinic

Elissa Rennert-May,¹ Elisabeth Hansen,² Toktam Zadeh,² Valerie Krinke,³ Stan Houston,^{1,4} and Ryan Cooper^{1,2,4}

- Calgary Refugee Screening program new refugees
- In house Interpreters, health navigators, transport support
- 147 offered
- **96% accepted,**
- **73% completed**

Rennert. Canadian Resp J 2016 doi.org/10.1155/2016/7980869

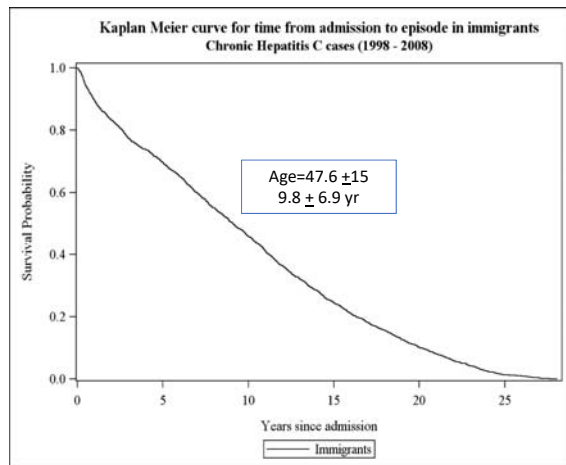
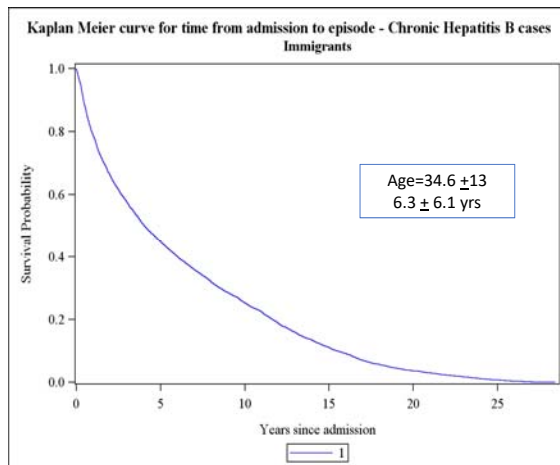
Chronic Hepatitis B and C



- Increased death from HCC and viral hepatitis 2-4 fold
- Refugee 2-fold greater risk of death
- Increased hospitalizations for HBV
- Those with HCV increased risk to die in hospital from HCC
- HBV effective vaccine, suppressive therapy
- HCV curative therapy >95%
- Cost-effective to screen/treat for HBV and HCV

Desmeules; Rossi 2012 PlosOne Greenaway 2015 PLoS ONE 10(11): e0141715; Greenaway BMC Infect Dis (2017) 17:140 Kamstra Clin ID 2016;63(11):1439-48; Ng CMAJ Open 2016. DOI:10.9778/cmajo.20150117

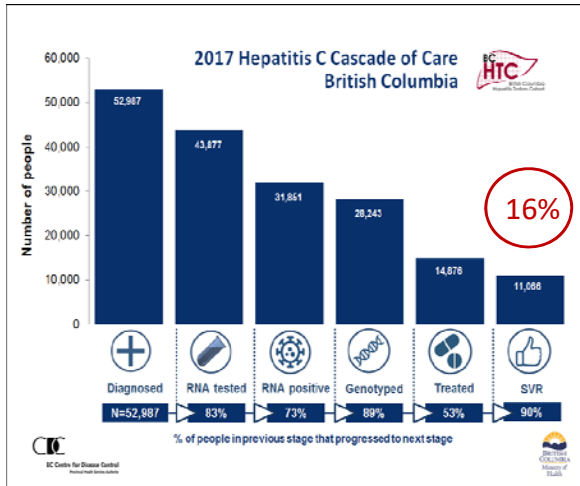
Delayed diagnosis of viral hepatitis after arrival



Missed Opportunity to diagnose
HBV and HCV

2017 Greenaway. BMC ID

Weak HCV Care Continuum strengthened by patient centered culturally-linguistically adapted programs



BC Hepatitis C Testers Cohort (BCHTC): 2017 cascade of care.
 Available online: <https://bchtc.med.ubc.ca/hepatitis-c-cascade-of-care-in-bc/>
 Lazarus et al., Seminars in Liver Disease. 2018;38(3):181-192.
 (Perumalswami et al. 2013) J Hepatol, (Fernandez et al. 2014) EU-HEP-SCREEN, (Linde et al. 2016) Public Health Rep



21-95% screening uptake
 ~50% Linked to care



64% Linked to care



71% screening uptake
 76-93% Linked to care

HIV Immigration Screening: Similar rates, increasing numbers

- 790,180 pre-landing exams 2002-2003
- Risk low 0.15%,
- Africans refugees at highest risk 3-4%
- Similar HIV pattern to country of origin

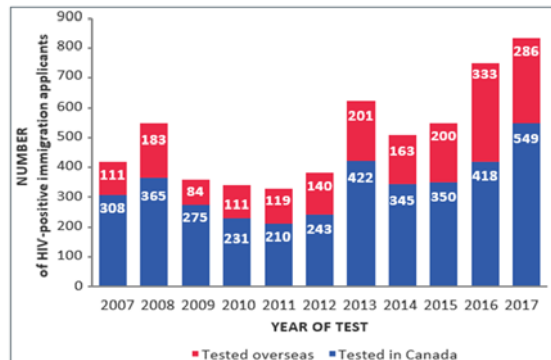
- 2007-2017 Rate= 0.14%
- Increase total number HIV detected
- Increased total number (%) tested in Canada

Table 1 HIV cases by immigration categories, by gender rate/100,000—years: 2002 and 2003

Immigration categories class	HIV cases				M:F ratio	Rate/100,000		
	F	M	Total	% by class		F	M	Total
Economic	32	56	88	9	1.8	22	30	30.47
Family class	72	73	145	16	1.0	120	143	143.36
Refugees	176	156	332	36	0.9	1302	1301	1301.40
Refugee claims	133	185	318	34	1.4	501	490	489.86
Others (visitors, students, workers)	28	21	49	5	0.8	34	28	30.81
Total	441	491	932		1.1	50	44	146

F=Female, M=Male

Zencovich 2006 Int J STD&AIDS;17:813-816 Haddad CDDR 2018;44-12:324-332

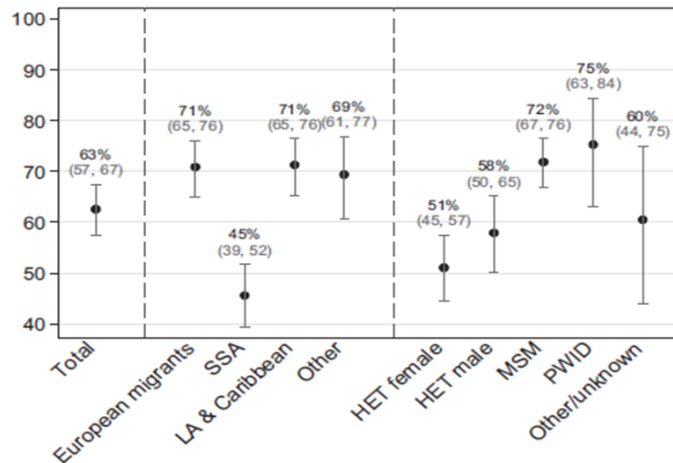


* For migrants tested in Canada, "year" refers to the year the test was administered. For migrants tested overseas, "year" refers to the year the migrant landed in Canada

Haddad 2018. CDDR HIV in Canada-Surveillance Report, 2017

Post arrival acquisition of HIV among immigrants

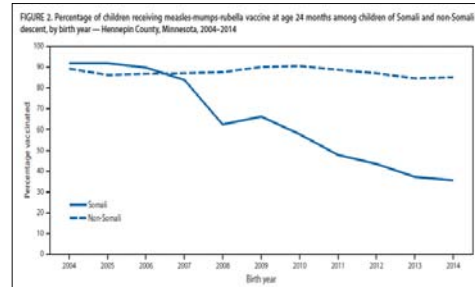
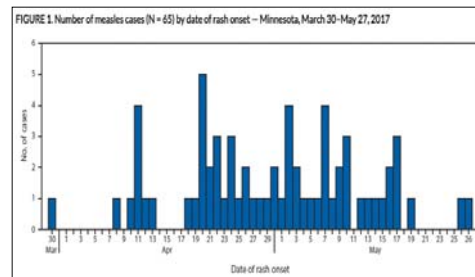
- HIV occurred in 2209 migrants within 5 years of arrival in Europe
- >50% of HIV cases acquired post arrival due to risk behaviors



Alvarez-del Arco AIDS 2017, 31:1979-1988

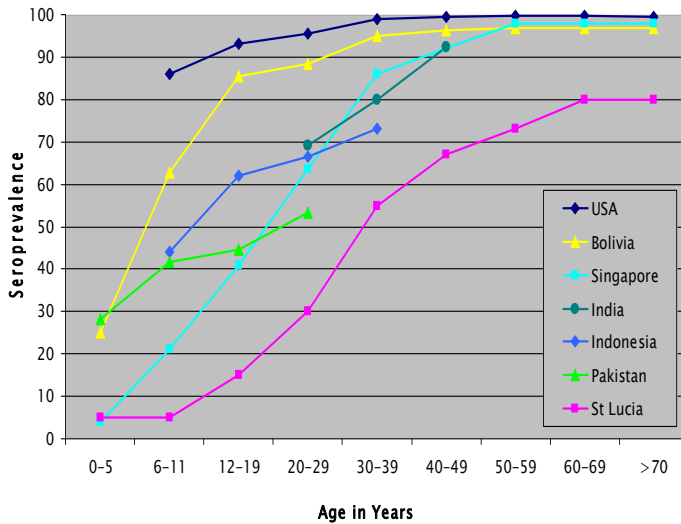
Immigrants at increased risk for Vaccine Preventable Diseases

- Vaccine coverage 60-90%
- Adults increased susceptible to MMR (~30%) and other childhood VPD
- Children may be more susceptible
- At risk for outbreaks post-arrival (measles, rubella, varicella)
- Potential for vaccine hesitancy post arrival
- Barriers accessing vaccines post-arrival (knowledge, cultural beliefs, access to care, hesitancy)



2007 Annals Int Med. Greenaway et al, Hall 2017 MMWR;66(27):713-717
Bahta Oct 2015. Minnesota Medicine; Wilson 2018 Vaccine;1055-1062

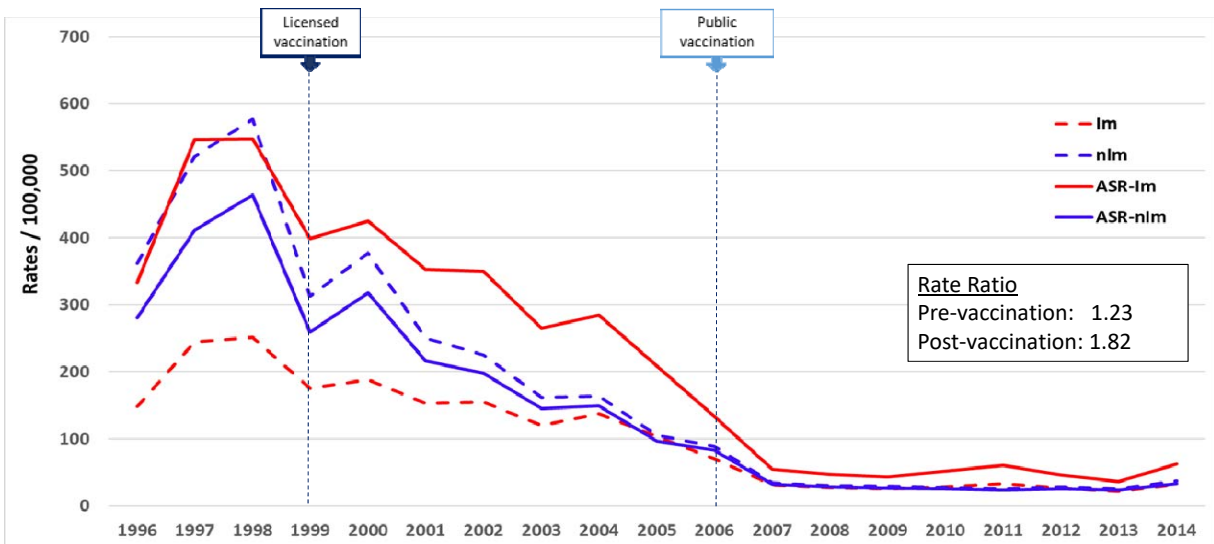
Increased susceptibility and burden of varicella in immigrants



- Temperate countries >95% immune by age 20 vs tropical ~70%
- Outbreaks of varicella in immigrant esp crowded settings
- Adults ↑ risk of hospitalization, death
- Cost-saving to give varicella vaccine with prior serotesting

Bollaerts K et al. 2017; Lebo EJ et al. 2014; Lolekha S et al. 2001; Munasingha H et al. 2018; Fatha N et al. 2014; Doshi RH et al. 2018; Bartoloni A et al. 2002. Greenaway 2013 Infection & Epi;142(8):1695-1707, Merrett Clin Infec Dis 2007;44:1040-8

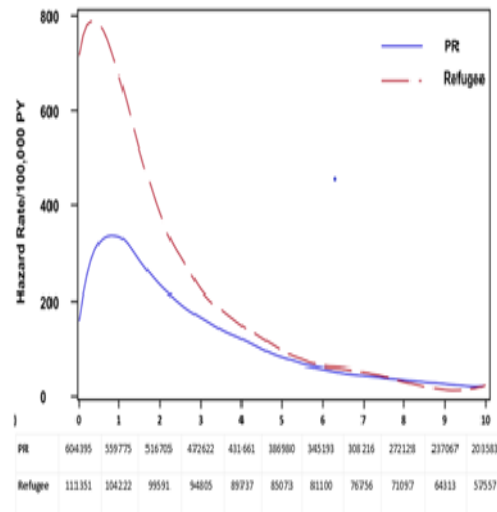
Higher risk of varicella in Quebec immigrants that increases after childhood vaccination. Age-adjusted and crude rates (1996-2014)



Greenaway 2019 Submitted

Varicella risk in immigrants highest in first 2 years

- Immigrants <50 years at higher risk for varicella
- South Asia and Latin American and the Caribbean at highest risk (2-5 fold)
- Refugees 10% higher risk compared to immigrants
- >50% of cases occurred within the first 2 years after arrival
- Screen for varicella immunity and vaccinate as soon as possible after arrival



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Other Tropical Diseases

Malaria

Chagas

Strongyloides

Schistosomiasis

Etc.....

Systematic screening for infectious diseases in migrants

Blood count; serum biochemistry; basic urine

TST or IGRA ASAP after arrival, target high TB incidence countries, medical co-morbidities

HIV serology All vs $\geq 1\%$ vs if Risk factors

HBV serology (HBsAg, HBsAb, HbCAb) countries with $\geq 2\%$ HBsAg

HCV countries $\geq 2\%$ HCV prevalence or if risk factors

Update routine childhood vaccines MMR and Dtap vaccines in adults and kids

Varicella serology if negative/unclear history and > 13 yrs,
vaccinate kids < 13 years

Strongyloides serology (from tropical endemic countries)

Schistosoma serology (from Africa, other endemic areas)

Chagas serology (from Latin America)

« Passerelle vers un avenir en santé » for Newly Arrived Refugees

The screenshot shows a website page with a blue header for the 'Ministère de la Santé et des Services sociaux'. The main content area features the title 'Une passerelle vers un avenir en santé' and a sub-header 'Orientations ministérielles concernant les services de santé et les services sociaux offerts aux personnes réfugiées à leur arrivée au Québec'. To the right, there is a logo for the 'Centre intégré universitaire de santé et de services sociaux du Centre-Ouest-de-l'Île-de-Montréal' and the 'Centre d'expertise sur le bien-être et l'état de santé physique des réfugiés et des demandeurs d'asile'. Below the logo is the text 'Direction des affaires académiques'. At the bottom right, there are navigation links: 'ACCUEIL', 'À PROPOS', 'WEBINAIRES', and 'TROUSSE D'OUTILS'. The Québec logo is at the bottom center.

<http://www.msss.gouv.qc.ca/> <https://cerda.info/nous-joindre/>



Immigrant Health Guidelines/Resources

GUIDELINES CMAJ

Evidence-based clinical guidelines for immigrants and refugees

Kevin Pottie MD MCISc, Christina Greenaway MD MSc, John Feightner MD MSc, Vivian Welch MSc PhD, Helena Swinkels MD MHSc, Mels Rashid MD, Lavanya Narasiah MD MSc, Laurence J. Kirmayer MD, Erin Ueffing BHSc MHSc, Noni E. MacDonald MD MSc, Ghayda Hassan PhD, Mary McNally DDS MA, Kamran Khan MD MPH, Ralf Buhmann MDCM PhD, Sheila Dunn MD MSc, Arunmozhi Dominic MD, Anne E. McCarthy MD MSc, Anita J. Gagnon MPH PhD, Cécile Rousseau MD, Peter Tugwell MD MSc, and coauthors of the Canadian Collaboration for Immigrant and Refugee Health

Can Med Assoc J. Sept 9, 2011;183(12):E824-E925.

 **Caring for Kids
New to Canada** A guide for health professionals working with
immigrant and refugee children and youth  Canadian
Paediatric
Society

<http://www.kidsnewtocanada.ca/>

 Centre de ressources
multiculturelles
EN SANTÉ MENTALE  **Multicultural
MENTAL HEALTH**
Resource Centre     Bell
Cause pour
la cause

<https://www.multiculturalmentalhealth.ca/en/>

Data, Policy and Infrastructure Gaps

- Several data gaps burden, and optimal interventions. Challenging due to heterogeneity of the immigrant population
- Lack of policies to screen all migrant groups and to update vaccines (adolescents and adults)
- Lack of programs to screen all migrants groups and update vaccines
- Lack of migrant friendly health care systems (health care navigators, interpreters, cultural brokers)

Conclusions

- Immigrants and refugees have several preventable infectious disease health disparities that could be decreased through screening and linkage to care and treatment and vaccination
- Perform targeted screening/health promotion for immigrants
- Promote the development of linguistically and culturally adapted clinical services
- Continue doing research and provide the evidence base for policy