CHRONIC DISEASE IN VULNERABLE IMMIGRANT POPULATIONS

A growing concern
Presenter Disclosure

Presenter: Nicole Nitti MD CCFP(EM)FCFP, AKM

Relationships to commercial interests:

No commercial interests
Disclosure of Commercial Support

- No commercial support of conflict of interest
Question:

How do *poverty and migration experience/status* affect the risk and management of *chronic illness* and how can we mitigate it?
What we did:

- **Literature review**
  - Conducted systematic literature review
  - Adopted PRISMA model for sorting articles
  - Keywords: refugee, chronic disease, hypertension, diabetes, chronic care model
  - Searched databases
  - Generated non-directional hypothesis

![Diagram showing the process of literature review]

- **Total Citations retrieved from PubMed, Cochrane, CINAHL**
- **Duplicate articles**
- **Articles excluded after reviewing title or abstracts**
- **Remaining articles n=55**
- **Articles identified for possible inclusion n=36**
- **Articles excluded, did not fulfill all inclusion criteria**
- **Articles finally selected for review**
How do we collect data?

15. What is your current immigration status? Check ONE only.

- Canadian Citizen
- Permanent Resident
- Government Assisted Refugee # _________________________
- Privately Sponsored Refugee # _________________________
- Refugee claimant
- Humanitarian or Compassionate process
- Live-in Caregiver
- Temporary Foreign Worker
- Seasonal Agricultural Worker
- Student Authorization (Student Visa)
- Visitor Visa
- Non-Status
- Blended Visa-office referred program # _________________________
- Other, _________________________

16. What was your immigration status when you first came to Canada? Check ONE only.
Chart review from NOD
- Retrospective comparative study with clients from the NOD database

- Limitations:
  - Transition of NOD versions and demographic indicators
  - Comorbidities for DM and HTN
Immigration Status of Clients

- Unknown: 43%
- Citizen: 10.3%
- Non-Status: 1.9%
- Permanent Resident: 25%
- Refugee: 19.9%

Number of Refugees:
- 2012-13: 756
- 2013-14: 1707
- 2014-15: 1995
- 2015-16: 2413

$R^2 = 0.9873$
## Attributes of Refugee Clients with Hypertension & Diabetes

<table>
<thead>
<tr>
<th></th>
<th>Hypertension</th>
<th>Diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Racial/Ethnic group</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White- Europeans</td>
<td>22.6%</td>
<td>18.9%</td>
</tr>
<tr>
<td>Asian- South</td>
<td>17.9%</td>
<td>18%</td>
</tr>
<tr>
<td>Latin American</td>
<td>12.8%</td>
<td>14.1%</td>
</tr>
<tr>
<td><strong>Strength of relationship with Racial/Ethnic group</strong></td>
<td>$\chi^2=40.7$, df=15, p=0.000</td>
<td>$\chi^2=35.1$, df=15, p=0.003</td>
</tr>
<tr>
<td>Clients did not reach guideline recommended targets</td>
<td>61.9%</td>
<td>60.9 %</td>
</tr>
</tbody>
</table>
### Distribution Statistics

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Overall (among clients seen by the PC team)</th>
<th>Refugees (among clients with chronic diseases)</th>
<th>Not Refugees (among clients with chronic diseases)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Age</td>
<td>33.9 ± 18.2 years</td>
<td>53.6 ± 12.2 years</td>
<td>60.5 ± 13.7 years</td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td>6.0%</td>
<td>35.7%</td>
<td>21.2%</td>
<td>$\chi^2 = 50.1 \text{ df } 1 \ p &lt; 0.01;\ \text{ODDS ratio: } 5.8 \ CI \ 3.5-9.6$</td>
</tr>
<tr>
<td>Diabetes Mellitus</td>
<td>5.5%</td>
<td>21.5%</td>
<td>42.1%</td>
<td>$\chi^2 = 29.1 \text{ df } 1 \ p &lt; 0.01;\ \text{ODDS ratio: } 0.27 \ CI \ 0.17-0.44^*$</td>
</tr>
</tbody>
</table>
Identified factors for compliance with the chronic disease management recommendations

<table>
<thead>
<tr>
<th>Drivers for Clients with Hypertension</th>
<th>Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not having a second care provider</td>
<td>F= 47.3; p=0.000</td>
</tr>
<tr>
<td>Age in years</td>
<td>F= 5.7; p=0.018</td>
</tr>
<tr>
<td>Insurance status</td>
<td>F= 5.1; p=0.025</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Drivers for Clients with Diabetes</th>
<th>Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not having a second care provider</td>
<td>F=10.8; p=0.001</td>
</tr>
<tr>
<td>Age in years</td>
<td>F=9.9; p=0.002</td>
</tr>
<tr>
<td>Insurance status</td>
<td>F= 6.2; p=0.013</td>
</tr>
</tbody>
</table>
• Non-communicable diseases (NCDs), such as heart disease, stroke, cancer, chronic respiratory diseases and diabetes, are the **leading cause of mortality** in the world.......

• The **burden is growing** - the number of people, families and communities afflicted is increasing........

• The NCD threat can be **overcome using existing knowledge**. The solutions are highly cost-effective. Comprehensive and integrated action at country level, led by governments, is the means to achieve success.
Chronic disease risk

**Biological**
- age
- Family history
- Ethnicity
- Genetics
- Presence of associated conditions

**Lifestyle**
- Smoking
- BMI
- Physical activity level
- Food habit

**Environment**
- Pollution
- Chronic stress
- Safe communities
- Access to screening and health promotion

**Social determinants**
- Income levels
- Housing
- Education

**Migration experience**
- Region
- Internal displacement
- Exposure to trauma
- Access to screening and health care
Age- and sex-related prevalence of diabetes mellitus among immigrants to Ontario, Canada

Maria Isabella Creatore MSc, Rahim Moineddin PhD, Gillian Booth MD MSc, Doug H. Manuel MD, Marie DesMeules MSc, Sarah McDermott MSc, Richard H. Glazier MD MPH

Previously published at www.cmaj.ca

Figure 3: Age-specific prevalence of diabetes in 2005 among recent immigrants to and long-term residents of Ontario, by sex.
Age- and sex-related prevalence of diabetes mellitus among immigrants to Ontario, Canada

Maria Isabella Creatore MSc, Rahim Moineddin PhD, Gillian Booth MD MSc, Doug H. Manuel MD, Marie DesMeules MSc, Sarah McDermott MSc, Richard H. Glazier MD MPH

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>World region of birth</strong></td>
<td></td>
</tr>
<tr>
<td>Western Europe and North America</td>
<td>1.00 (ref)</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>2.31 (2.17–2.45)</td>
</tr>
<tr>
<td>Female</td>
<td>1.83 (1.72–1.95)</td>
</tr>
<tr>
<td>North Africa and Middle East</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1.82 (1.72–1.93)</td>
</tr>
<tr>
<td>Female</td>
<td>1.60 (1.50–1.70)</td>
</tr>
<tr>
<td>Eastern Europe and Central Asia</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>0.92 (0.86–0.97)</td>
</tr>
<tr>
<td>Female</td>
<td>0.90 (0.85–0.95)</td>
</tr>
<tr>
<td>Latin America and Caribbean</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>2.18 (2.08–2.30)</td>
</tr>
<tr>
<td>Female</td>
<td>2.40 (2.29–2.52)</td>
</tr>
<tr>
<td>South Asia</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>4.01 (3.82–4.21)</td>
</tr>
<tr>
<td>Female</td>
<td>3.22 (3.07–3.37)</td>
</tr>
<tr>
<td>East Asia and Pacific</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1.58 (1.50–1.66)</td>
</tr>
<tr>
<td>Female</td>
<td>1.50 (1.43–1.57)</td>
</tr>
<tr>
<td><strong>Time since arrival, yr</strong></td>
<td></td>
</tr>
<tr>
<td>5–9</td>
<td>1.00 (ref)</td>
</tr>
<tr>
<td>10–14</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1.22 (1.18–1.25)</td>
</tr>
<tr>
<td>Female</td>
<td>1.22 (1.19–1.26)</td>
</tr>
<tr>
<td>≥ 15</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1.52 (1.48–1.56)</td>
</tr>
<tr>
<td>Female</td>
<td>1.40 (1.36–1.44)</td>
</tr>
<tr>
<td><strong>Income quintile</strong></td>
<td></td>
</tr>
<tr>
<td>Quintile 5 (highest)</td>
<td>1.00 (ref)</td>
</tr>
<tr>
<td>Quintile 4</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1.17 (1.12–1.22)</td>
</tr>
<tr>
<td>Female</td>
<td>1.19 (1.14–1.24)</td>
</tr>
<tr>
<td>Quintile 3</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1.22 (1.18–1.27)</td>
</tr>
<tr>
<td>Female</td>
<td>1.22 (1.18–1.27)</td>
</tr>
<tr>
<td>Quintile 2</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1.24 (1.19–1.28)</td>
</tr>
<tr>
<td>Female</td>
<td>1.29 (1.24–1.34)</td>
</tr>
<tr>
<td>Quintile 1 (lowest)</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1.31 (1.26–1.36)</td>
</tr>
<tr>
<td>Female</td>
<td>1.38 (1.34–1.44)</td>
</tr>
</tbody>
</table>
### Educational level at landing

<table>
<thead>
<tr>
<th>Category</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>University degree or higher</td>
<td>1.00 (ref)</td>
<td></td>
</tr>
<tr>
<td>Some university</td>
<td>1.01 (0.96–1.06)</td>
<td>0.98 (0.92–1.04)</td>
</tr>
<tr>
<td>Non-university qualifications</td>
<td>1.14 (1.11–1.18)</td>
<td>1.10 (1.06–1.15)</td>
</tr>
<tr>
<td>Secondary level or less</td>
<td>0.97 (0.94–0.99)</td>
<td>1.32 (1.28–1.37)</td>
</tr>
<tr>
<td>No education</td>
<td>0.56 (0.53–0.60)</td>
<td>1.14 (1.09–1.20)</td>
</tr>
</tbody>
</table>

### Immigration visa category

<table>
<thead>
<tr>
<th>Category</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic: business</td>
<td>1.00 (ref)</td>
<td></td>
</tr>
<tr>
<td>Economic: skilled, family</td>
<td>1.25 (1.18–1.32)</td>
<td>1.47 (1.37–1.58)</td>
</tr>
<tr>
<td>Economic: skilled, independent</td>
<td>1.15 (1.09–1.22)</td>
<td>1.47 (1.38–1.57)</td>
</tr>
<tr>
<td>Family</td>
<td>1.25 (1.19–1.32)</td>
<td>1.63 (1.53–1.74)</td>
</tr>
<tr>
<td>Refugee</td>
<td>1.32 (1.25–1.40)</td>
<td>1.67 (1.56–1.78)</td>
</tr>
<tr>
<td>Other</td>
<td>1.33 (1.22–1.45)</td>
<td>1.61 (1.48–1.75)</td>
</tr>
</tbody>
</table>
Subgroups at risk

- Seniors (aged 65 and over),
- Women
- low-income immigrants
- non-European immigrants
- Refugees
Table 3. Prevalence of elevated BP and impaired glycemic control in clinic patients 15 y and older

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>ELEVATED BP (SBP ≥ 130 mm Hg OR DBP ≥ 85 mm Hg)</th>
<th>IMPAIRED GLYCEMIC CONTROL (FBG ≥ 6.1 mmol/L OR RBG ≥ 11.1 mmol/L OR HbA1c ≥ 6%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NO. OF POSITIVE RESULTS (NO. OF AVAILABLE RESULTS)</td>
<td>NO. OF POSITIVE RESULTS (NO. OF AVAILABLE RESULTS)</td>
</tr>
<tr>
<td></td>
<td>PREVALENCE, %</td>
<td>PREVALENCE, %</td>
</tr>
<tr>
<td>Total</td>
<td>219 (742)</td>
<td>30</td>
</tr>
<tr>
<td>Sex</td>
<td>&lt; .001</td>
<td>30</td>
</tr>
<tr>
<td>• Male</td>
<td>119 (316)</td>
<td>38</td>
</tr>
<tr>
<td>• Female</td>
<td>100 (426)</td>
<td>23</td>
</tr>
<tr>
<td>Age group, y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• 15-29</td>
<td>35 (265)</td>
<td>13</td>
</tr>
<tr>
<td>• 30-44</td>
<td>89 (329)</td>
<td>27</td>
</tr>
<tr>
<td>• 45-59</td>
<td>66 (111)</td>
<td>59</td>
</tr>
<tr>
<td>• ≥ 60</td>
<td>29 (37)</td>
<td>78</td>
</tr>
<tr>
<td>Region*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Africa</td>
<td>72 (258)</td>
<td>28</td>
</tr>
<tr>
<td>• Americas*</td>
<td>9 (50)</td>
<td>18</td>
</tr>
<tr>
<td>• Asia†</td>
<td>22 (100)</td>
<td>22</td>
</tr>
<tr>
<td>• Eastern Mediterranean</td>
<td>28 (124)</td>
<td>23</td>
</tr>
<tr>
<td>• Europe</td>
<td>88 (210)</td>
<td>42</td>
</tr>
</tbody>
</table>
Refugee populations are changing
High Prevalence Rates of Diabetes and Hypertension Among Refugee Psychiatric Patients

John David Kinzie, MD,* Crystal Riley, MA,* Bentson McFarland, MD, PhD,* Meg Hayes, MD,† James Boehnlein, MD,* Paul Leung, MD,* and Greg Adams, MD‡

- Found significantly higher rates of diabetes and hypertension in refugee psychiatric patients
  - Compared to US norms
  - Compared to regional prevalence
Biology-

- PTSD associated with obesity and metabolic syndrome
- Some Epidemiological studies show a link between PTSD and Diabetes
- Increased cortisol, increased insulin resistance, increase inflammatory markers
The importance of chronic disease to the health of refugees is under-recognized.

Let's start talking!
Categories of refugees

- **Government assisted refugees**
  - Identified by UN and referred to participating countries and brought to Canada by the government
  - Transportation loans
  - RAP, IFH & OHIP

- **Privately sponsored refugees**
  - Identified by UN and sponsored by organizations or groups of citizens
  - OHIP, IFH

- **Refugee claimants**
  - Claim refugee status on arrival to Canada (within 30 days)
  - Eligibility of claim determined
  - IRB hearing and Appeal process
  - Irregular arrivals
  - IFH
Which category do you fit into?

We're running for our lives.
Case examples

**M.A.**
- Left Syria to Beirut 4 years ago
- Heart disease
- No medical care from 2 years before he left
- Sought out drivers going back to Syria for medications
- Initial blood work showed an A1c of 10.2%

**S.M.**
- Fled from Afghanistan to Pakistan with family because Taliban wanted to marry daughter
- Beaten and tortured when he refused
- Paid $$ for passage to Canada- when got on the plane, family not there
- Significant PTSD symptoms
- Untreated diabetes
- No health care for 3 months after arrival to Canada
Considerations for Refugees

- **Pre migration**
  - Cultural, geographic, health systems

- **Transition period**
  - Length of time, access to health care and medications, living conditions, lifestyle and culture of transition culture

- **Post migration**
  - Healthy immigrant effect, access to health care and medications, access to health promotion education,
Levels of social support and strength of social networks, both within refugee communities and between resettled refugees and the host community, are among the most critical factors in how both resettled refugees and refugee claimants integrate into Canadian society.

Ceris FINAL REPORT Refugee Research Research Synthesis 2009 - 2013
Other vulnerable groups

KEEP CALM AND WAIT 3 MONTH

Access Alliance
Multicultural Health and Community Services
Non status

- Failed refugee claimants
- Expired visa
- Children of non status parents
- Implications for diagnosis and management?
Impact of poverty -

- **Smoking rate** among the poorest people in Ontario is 22.1%, compared with 14.4% for the richest people, and 18.2% for Ontario overall.

- **Physical inactivity rate** of 54.7% among the poorest people was substantially higher than among the richest people (32.1%), and 44.6% for Ontario overall.

- **Inadequate fruit and vegetable intake** among the poorest people in Ontario is 65.2%, compared with 56.7% for the richest people, and 60.8% for Ontario overall.

The poorest people in Ontario are nearly twice as likely to report having multiple chronic conditions as the richest people – 23.5% compared with 12.4%, and 16.2% for Ontario overall.
What is going on with immigrants in Ontario?

Rising Unemployment

1981
Unemployment rate for immigrants and Canadian-born: approximately 8%.

2015
Unemployment rate for immigrants: 30% higher than Canadian-born (6.9% vs 5.4%).

Higher for recent immigrants (10.9% vs 5.4%).

Increasing Low-Income Rate

The low-income rate for very recent immigrants rose from 1.4 times that of the Canadian-born in 1980 to 2.4 times in 2005. Among long-term immigrants, the rate rose from 0.8 times to 1.9 times. During the same period, the rate for the Canadian-born declined from 17.2% to 13%.

Recent Immigrant Women Face The Worst Outcomes

49% of all immigrant women work part-time compared to the 36% of all immigrant men.

3x

Recent immigrant women are working for minimum wage at almost 3x the rate of the total population.

Rising Income Disparity

In 2005, recent immigrant men and women earned 63% and 56% respectively of the incomes earned by Canadian-born men and women. These figures were 85% for both in 1980.

Recent Immigrants

Canadian-Born

- 16%
- 8.3%

2x

Recent Immigrants more likely to work in temporary positions than their Canadian-born peers.
Specifically for refugees

- “refugees tended to have the highest overall rates of unemployment with men at 16.5% and women at 27.8% after four years in Canada. Skilled immigrants stood at 11.4% and 11.1% for male and female principal immigrants respectively at the 4 year point.

- “Refugees faced the longest time periods on average before securing their first jobs (8.8 months for male refugees and 17.1 months for female refugees)” compared to male skilled principal immigrants (3.5 months) and female skilled principal immigrants (4.2 months).

- “Four years after their landing, skilled worker principal applicants received the highest wages ($21.43 for males and $18.70 for females). The groups who received the lowest wages at the 4 year point were female refugees ($9.63), female family class ($11.68) and male refugees ($12.03).”
Barriers to healthy outcomes

- Language
- Access to care
  - Lack of access to chronic disease prevention education - low income minorities
  - Inability to take time to access care
  - Lack of understanding/trust of the primary care system
- Medication coverage
- Mental health
- Different Explanatory models of illness - tradition vs biomedical
- Unmet expectations of health care system/providers
Refugees’ Perceptions of Healthy Behaviors
Donelle M. Barnes1,3 and Nina Almasy2

- Exercise in leisure time
  - majority felt a reduction since migration especially in women
  - Lack of access to facilities
  - Almost all (94%) agreed that they would be interested in an activity program for people who spoke their language

- Smoking rates
  - Varying reports on smoking rates depending on country of origin
  - Majority of smokers increased they amount of smoking after arrival
  - Most common way to try to stop was “cold turkey”

- Healthy eating
  - 55% overweight, 61% felt they ate more fat due to fast food
  - Barriers to healthy eating included- loss of traditional food sources, cost, less time to cook meals
Ontario’s CDPM Framework

INDIVIDUALS AND FAMILIES

Healthy Public Policy
Supportive Environments
Community Action

Personal Skills & Self-Management Support
Delivery System Design

HEALTH CARE ORGANIZATIONS

Provider Decision Support
Information Systems

COMMUNITY

Productive interactions and relationships

Activated communities & prepared, proactive community partners
Informed, activated individuals & families
Prepared, proactive practice teams

Improved clinical, functional and population health outcomes
Using the Chronic Care Model to improve health outcomes

- **Information systems:**
  - Better tracking and understanding of chronic disease in refugees both before and after they arrive at host country
    - Immigration status on arrival not often captured
    - Many studies based on self reported dx
    - Understanding burden of chronic disease among displaced people

- **Decision support**
  - Earlier and consistent screening for relevant chronic disease's and risk factors
    - guidelines and templates
Delivery Design

- Language services
  - Most frequently sited
  - Professionally trained medical interpreters in order to prevent miscommunication/emphasis affecting care

- Team composition
  - peers, mental health workers

- Culturally competent health promotion
  - diet, exercising

- Supporting health literacy
  - primary care systems, appointments, system navigation

- Supporting SDOH
  - health often not the biggest priority-Housing, employment, transportation
Self management

- Culturally competent messaging vital
- Key to self management helping people understand the “value add”

“Health promotion activities were of very secondary consideration compared with more basic issues of physical, mental and emotional survival”
Effectiveness of prevention programmes for obesity and chronic diseases among immigrants to developed countries – a systematic review

Andre MN Renzaho¹,* , David Mellor², Kelly Boulton¹ and Boyd Swinburn¹

“Interventions that showed improvement had something in common:

the application of a cultural competence framework and cultural leverage. That is, they used community participants’ expertise and social structures both to define strategies for addressing culture-related factors and to shape the intervention”
Small group discussions

- Share experiences in working with refugees or non-status
- What was the impact of chronic illness on their health and ability to thrive?
- Describe examples of effective programming
Take home messages

 Chronic disease prevention and management is an important and under recognized topic in refugee health

 Being a refugee or a vulnerable immigrant should be considered a risk factor for chronic disease and screening practices should reflect that

 There is an important intersection between migration, income level and unemployment influencing chronic disease risk that needs to be explored
   Improved data collection on immigration status and other social determinants needed!

 There are effective ways to mitigate obstacles in successful CDPM in refugee and vulnerable immigrant populations