Immigrant Density, Sense of Community Belonging, and Suicidal Ideation among Racial Minority and White Immigrants in Canada

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- Perry Hystad (UBC School of Population and Public Health)

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- UBC Doctoral fellowship (Pan)
- Michael Smith Foundation for Health Research Investigator Award (Carpiano)
- CIHR New Investigator Award (Carpiano)
Background

* Suicide in Canada
  * 10th leading cause of death
  * 3,705 suicides per year
  * 11.1 suicides per 100,000 persons

* Immigrants in Canada
  * 20% of Canadians
  * “Healthy immigrant effect” → lower suicide rate for immigrants
    * 9.9 suicides per 100,000 persons

(Statistics Canada 2008; Statistics Canada 2010; Malenfant, et al. 2004)
Background

* Suicide in Canada
  * 10th leading cause of death in Canada
  * 3,705 suicides per year
  * 11.1 suicides per 100,000 persons

* Immigrants in Canada
  * 20% of Canadians are foreign-born
  * “Heath migrant effect” → lower suicide rate among immigrants
    * 9.9 suicides per 100,000 persons
  * But, immigrants may account for 20% of all Canadian suicides based on current immigration trends and suicide rates

(Statistics Canada 2008; Statistics Canada 2010; Malenfant, et al. 2004)
Multilevel conceptual model of suicidal ideation

Perceived stress → SUICIDAL IDEATION → Suicide Attempt → Completed Suicide

Intrapersonal

- Personal characteristics
  - Sex
  - Race
  - Genetics
  - Coping Skills
  - Cultural identity
  - Sense of belonging

(Braucht 1979; DeMan 1998; Bhugra 2004)
Multilevel conceptual model of suicidal ideation

Negative Life Experiences
- Cultural bereavement
- Discrimination
- Acculturative stress

Perceived stress → SUICIDAL IDEATION → Suicide Attempt → Completed Suicide

Personal characteristics
- Sex
- Race
- Genetics
- Coping Skills
- Cultural identity
- Sense of belonging

Intrapersonal
Proximal environment

(Braucht 1979; DeMan 1998; Bhugra 2004)
Multilevel conceptual model of suicidal ideation

(Braucht 1979; DeMan 1998; Bhugra 2004)
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Multilevel conceptual model of suicidal ideation

**Regional-level environment**

- Immigrant density
- Ethnic density
- Urbanization
- Area deprivation

**Proximal environment**

- Perceived stress
- Social Support: Close friends, Counselors, Family, Neighbors

**Intrapersonal**

- Personal characteristics: Sex, Race, Genetics, Coping Skills, Cultural identity, Sense of belonging

**Completed Suicide**

(Braucht 1979; DeMan 1998; Bhugra 2004)
Immigrant suicide rates lower in Montreal/Toronto/Vancouver

(Malenfant, 2004)
Higher immigrant density → Lower odds of depression

(Stafford, 2010)

**Immigrant density** = **immigrant population/total population**

<table>
<thead>
<tr>
<th>Immigrant Status</th>
<th>Adjusted odds of depression per 10% increase in immigrant density of health region (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immigrated to Canada &lt; 10 years ago</td>
<td>0.84 (0.70-1.00)</td>
</tr>
<tr>
<td>Immigrated to Canada &gt; 10 years ago</td>
<td>0.97 (0.92-1.03)</td>
</tr>
<tr>
<td>Canadian-born</td>
<td>1.02 (0.98-1.06)</td>
</tr>
</tbody>
</table>
Race/ethnicity modifies effect of immigrant density on depression

(Stafford, 2010)

**Depression and immigrant density by visible minority status**

![Graph showing depression odds ratio as a function of immigrant density by visible minority status. The graph includes two lines: one for whites and one for visible minorities.](image-url)
Sense of community belonging

- “The degree to which an individual feels attached to his/her community”
- Correlated with local social network ties
- Strong sense of community belonging → lower odds of suicidal ideation
- Sense of community belonging may be stronger for immigrants in areas of higher immigrant density

(Carpiano and Hystad, 2011; McLaren, 2007; Clarke, 2008)
Research questions

Does higher immigrant density protect against suicidal ideation among immigrants?

a. If so, is this association mediated by a stronger sense of community belonging?

b. If so, does race/ethnicity modify this association?
Hypotheses

1. High immigrant density will be associated with lower odds of suicidal ideation

2. Sense of community belonging will mediate the association between immigrant density and suicidal ideation

3. High immigrant density will be more strongly associated with suicidal ideation among racial minority versus white immigrants
METHODS
Multilevel Data Sources

INDIVIDUAL-LEVEL
* 2007-2008 Canadian Community Health Survey (CCHS)
* Residents of Alberta, British Columbia, & Ontario
* Foreign-born
* >15 years of age
* n=12,951

HEALTH REGION LEVEL
* 2006 Canadian census
* All health regions in Alberta, British Columbia & Ontario
* N=57
Multilevel Measures

**INDIVIDUAL-LEVEL**

- Suicidal ideation
  - Yes/No
  - Past 12 months
- Sense of community belonging
  - Strong/Weak
- Race
  - White/Non-white
- Confounders
  - Sex, age, recency of immigration, marital status, education

**HEALTH REGION LEVEL**

- Immigrant density
  - Immigrant population/total population
  - Units of 10% change
- Confounders
  - Median household income, residential stability, population density
  - All continuous
Stratified and weighted mixed effects analysis

* Generalized linear mixed effects models
  * Health region set as a random intercept
  * GLIMMIX procedure in SAS 9.2

* Weighted analysis
  * Probability weights derived from CCHS dataset

* Stratified by urban/rural status of the health region
  * Urban: > 150 residents per square kilometer
  * Rural: < 150 residents per square kilometer
RESULTS
Select individual-level variables

(Pan & Carpiano, in press)

Suicidal ideation
- Yes: 1%
- No: 99%

Sense of community belonging
- Strong: 38%
- Weak: 62%

Race/ethnicity
- White: 58%
- Non-white: 42%
Select area-level variables

(Pan & Carpiano, in press)

Average immigrant density.

Average total population (in thousands)

<table>
<thead>
<tr>
<th></th>
<th>Total (n=14)</th>
<th>Urban (n=43)</th>
<th>Rural (n=43)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>16%</td>
<td>34%</td>
<td>11%</td>
</tr>
<tr>
<td>Urban</td>
<td></td>
<td>722</td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>340</td>
<td>215</td>
<td></td>
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</tbody>
</table>
# Odds ratios for suicidal ideation

(Pan & Carpiano, in press)

<table>
<thead>
<tr>
<th></th>
<th>Adjusted for:</th>
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<tr>
<td></td>
<td>Individual-</td>
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<td></td>
<td>level</td>
<td>&amp; area-level</td>
<td>&amp; area-level</td>
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<td></td>
<td>confounders</td>
<td>confounders</td>
<td>confounders</td>
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<tr>
<td><strong>Health Region Level</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Per 10% increase in immigrant</td>
<td>.88</td>
<td>.93</td>
<td>.95</td>
<td></td>
</tr>
<tr>
<td>density</td>
<td>(.74, 1.05)</td>
<td>(.69, 1.27)</td>
<td>(.70, 1.29)</td>
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</tr>
<tr>
<td><strong>Individual Level</strong></td>
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</tr>
<tr>
<td>Weak (vs. Strong) Sense of</td>
<td></td>
<td></td>
<td></td>
<td>1.68*</td>
</tr>
<tr>
<td>community belonging</td>
<td></td>
<td></td>
<td></td>
<td>(1.24, 2.27)</td>
</tr>
</tbody>
</table>

*p<0.001

Odds ratios for suicidal ideation (Pan & Carpiano, in press)

*Odds ratios for suicidal ideation (Pan & Carpiano, in press)*
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<tr>
<td></td>
<td>Individual- &amp;</td>
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<tr>
<td></td>
<td>level</td>
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<tr>
<td></td>
<td>confounders</td>
</tr>
<tr>
<td><strong>Health Region Level</strong></td>
<td></td>
</tr>
<tr>
<td>Per 10% increase in immigrant</td>
<td>0.75**</td>
</tr>
<tr>
<td>density</td>
<td>(0.61, 0.93)</td>
</tr>
<tr>
<td><strong>Individual Level</strong></td>
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<tr>
<td>Weak vs. Strong Sense of</td>
<td></td>
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<tr>
<td>community belonging</td>
<td></td>
</tr>
<tr>
<td>White (vs. other) Race/ethnicity</td>
<td>0.65 †</td>
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<tr>
<td></td>
<td>(0.40, 1.07)</td>
</tr>
<tr>
<td><strong>Cross-level Interaction</strong></td>
<td></td>
</tr>
<tr>
<td>Per 10% increase in immigrant</td>
<td>1.33**</td>
</tr>
<tr>
<td>density x Race/ethnicity</td>
<td>(1.08, 1.65)</td>
</tr>
</tbody>
</table>

†p<0.1, **p<0.01
### Odds ratios for suicidal ideation

#### Rural Health Regions
(n=5139 participants within 43 health regions)

<table>
<thead>
<tr>
<th></th>
<th>Rural Health Regions</th>
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<tbody>
<tr>
<td></td>
<td>Adjusted for:</td>
<td>Individual-level</td>
<td>Individual- &amp; area-level</td>
<td>Individual- &amp; area-level</td>
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<tr>
<td></td>
<td></td>
<td>confounders</td>
<td>confounders</td>
<td>confounders</td>
</tr>
<tr>
<td>Health Region Level</td>
<td>Per 10% increase in immigrant density</td>
<td>0.41*</td>
<td>0.33*</td>
<td>0.34*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.20, 0.83)</td>
<td>(0.14, 0.77)</td>
<td>(0.15, 0.79)</td>
</tr>
<tr>
<td>Individual Level</td>
<td>Sense of community belonging</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strong</td>
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<td></td>
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</tr>
<tr>
<td>Weak</td>
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<tr>
<td>Race/ethnicity</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Racial minority</td>
<td></td>
<td>Ref</td>
<td>Ref</td>
<td>Ref</td>
</tr>
<tr>
<td>White</td>
<td></td>
<td>0.20***</td>
<td>0.19***</td>
<td>0.19***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.11, 0.39)</td>
<td>(0.10, 0.37)</td>
<td>(0.10, 0.37)</td>
</tr>
<tr>
<td>Cross-level Interaction</td>
<td>Per 10% increase in immigrant density</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>x Race/ethnicity</td>
<td></td>
<td>3.74**</td>
<td>4.24**</td>
<td>4.13**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1.69, 8.31)</td>
<td>(1.80, 9.98)</td>
<td>(1.76, 9.69)</td>
</tr>
</tbody>
</table>

* p<0.05, ** p<0.01, *** p<0.001
### Odds ratios for suicidal ideation

**Urban Health Regions**
(n=7812 participants within 14 health regions)

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td></td>
<td>Adjusted for:</td>
<td>Individual-level confounders</td>
<td>Individual- &amp; area-level confounders</td>
</tr>
<tr>
<td>Health Region Level</td>
<td>Per 10% increase in immigrant density</td>
<td>0.89 (0.61, 1.30)</td>
<td>1.27 (0.82, 1.96)</td>
</tr>
<tr>
<td>Individual Level</td>
<td>Sense of community belonging</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Strong</td>
<td>Ref</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Weak</td>
<td>1.44† (0.96, 2.16)</td>
<td></td>
</tr>
<tr>
<td>Race/ethnicity</td>
<td>Racial minority</td>
<td>1.46 (0.87, 2.45)</td>
<td>1.49 (0.89, 2.49)</td>
</tr>
<tr>
<td></td>
<td>White</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cross-level Interaction</td>
<td>Per 10% increase in immigrant density x Race/ethnicity</td>
<td>1.07 (0.74, 1.56)</td>
<td>1.07 (0.74, 1.55)</td>
</tr>
</tbody>
</table>

\[†p<0.1\]
CONCLUSIONS

1. High immigrant density will be associated with lower odds of suicidal ideation

   *Association only detected among rural non-whites. Why only rural?*
   - Mental health services more accessible in urban areas
   - Rural racism
   - Sparse number of urban health regions (n=14)

2. Sense of community belonging will mediate the association between immigrant density and suicidal ideation

   *No mediation detected. Why?*
   - Sense of community belonging may be a more localized measure

3. High immigrant density will be more strongly associated with suicidal ideation among racial minority versus white immigrants

   *Yes, immigrant density → suicidal ideation association only detected among non-whites*
Primary care screening in rural low immigrant density areas
  * Physician training to recognize suicide risks, particularly among non-white immigrants
  * Transcultural mental health services facilitated by internet video conferencing

Concerted efforts to build up local sense of community belonging may indirectly help to prevent suicide risk

Future research
  * Longitudinal studies
  * More refined area measures and group specific identifications
LIMITATIONS

* Specific racial/ethnic groups masked in public CCHS dataset
  * Associations sufficiently robust enough to detect among non-white aggregate group

* Cross-sectional study design precludes causal inference
  * Reverse causality may be a factor

* CCHS suicide module only administered in 3 of 10 provinces
  * But, 83% of immigrants are located in Alberta, British Columbia, and Ontario
Thank you!

stephen.w.pan@gmail.com


Pan SW, Carpiano RM. Immigrant density, sense of community belonging, and suicidal ideation among racial minority and white immigrants in Canada. Journal of Immigrant and Minority Health; in press.