Food insecurity and *H. pylori*-induced disease in female-led households compared to other households in Arctic Canada

CROMARTY T, ASSI A, GEARY J, CHANG HJ, DOVER D, COLQUHOUN A, GOODMAN KJ, COMMUNITY PROJECT PLANNING COMMITTEES, CANHelp WORKING GROUP
The University of Alberta respectfully acknowledges we are located in ᐃᒥᐢᑿᒌᐚᐢᑲᐦᐃᑲᐣ (Amiskwacîwâskahikan) on Treaty 6 territory, the territory of the Papaschase, and the homeland of the Métis Nation.
**Helicobacter pylori**
- Causes chronic stomach inflammation
- Increases risk of stomach ulcers and stomach cancer
- Disproportionately high prevalence in northern Canada

**Canadian North Helicobacter pylori (CANHelp) Working Group**
- Scientists, Northern community leaders, Health care providers
- Investigate *H. pylori* to address community concerns

*H. pylori* prevalence increases as socioeconomic status decreases
- How to measure socioeconomic status?
- Research participants reluctant or unable to report income
Developed by Doug Dover at Alberta Health
Quantifies Deprivation without using INCOME data; Instead, it uses:

<table>
<thead>
<tr>
<th>Education</th>
<th>Home Ownership</th>
<th>Food Security</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – University</td>
<td>0 – Owner</td>
<td>0 – Always Secure</td>
</tr>
<tr>
<td>1 – High School</td>
<td>1 – Renter</td>
<td>1 – Sometimes Insecure</td>
</tr>
<tr>
<td>2 – &lt; High School</td>
<td></td>
<td>2 – Always Insecure</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Raw Score</th>
<th>CDI Score</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>Least Deprived</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>4, 5</td>
<td>5</td>
<td>Most Deprived</td>
</tr>
</tbody>
</table>

Home Ownership & Education data collected by CANHelp Working Group, but not Food Security.
1. Estimate the frequency of *H. pylori*-associated disease in:
   - Women relative to men
   - Households led by non-partnered women relative to other households

2. Estimate the effect of the CDI and deprivation indicators on the frequency of *H. pylori*-associated disease in women and children.

3. Assess the validity of the CDI as a deprivation indicator for Arctic communities.
Methods

Adapted Household Food Security Module
• Appropriate for Arctic contexts
• Considers traditional foods, resources
• Low refusal rates

Piloted Spring 2017
• 4-6 Questions
• 3 Communities

Data Collection Fall 2017 – Spring 2018
• 39 Questions
• 8 Communities

EpilInfo iOS Companion
• Paperless data collection
• Built-in analyses tools
• Large, easy-to-read text
NORTHERN RESEARCH DAY

Results

Pilot Data Collection
• Inuvik, Teslin, Ross River
• 292 Households, 324 persons

Data Collection Progress
• Goal of 200+ Households:

- Aklavik
  - 27

- Carmacks
  - 33

- Fort McPherson
  - 27

- Ross River
  - 21

- Old Crow
  - 18

- Teslin
  - 18

- Inuvik Ongoing

- Pelly Crossing
  - TBD

- Pelly Crossing
  - 42
Pilot Data Analysis

*H. pylori* Prevalence by Canadian Deprivation Index (CDI) Level
- 264 with complete data for CDI score

*H. pylori* Prevalence by Degree of Food Insecurity
- 270 with Food Security data, classified as
  - Never insecure
  - Sometimes insecure
  - Often insecure

The CDI asks:

“You and other household members worried that food would run out before you got money to buy more. Was that *often true*, *sometimes true*, or *never true* in the past 12 months?”

Odds Ratios and 95% Confidence Intervals for the Estimated Effects of Deprivation Index and Food Insecurity on *H. pylori* Prevalence
## Pilot Data Analysis: CDI Score

1 is least deprived, 5 is most deprived

<table>
<thead>
<tr>
<th>CDI Score</th>
<th>All Households</th>
<th></th>
<th>Households Led by Unpartnered Women</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>1</td>
<td>47</td>
<td>18%</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>78</td>
<td>30%</td>
<td>28</td>
</tr>
<tr>
<td>3</td>
<td>61</td>
<td>23%</td>
<td>17</td>
</tr>
<tr>
<td>4</td>
<td>56</td>
<td>21%</td>
<td>11</td>
</tr>
<tr>
<td>5</td>
<td>22</td>
<td>8%</td>
<td>8</td>
</tr>
<tr>
<td>TOTAL</td>
<td>264</td>
<td></td>
<td>70</td>
</tr>
</tbody>
</table>
H. pylori prevalence is higher at higher deprivation levels
- Effect strongest in households headed by unpartnered women, though estimates are imprecise due to small numbers

<table>
<thead>
<tr>
<th>CDI Score</th>
<th>All Households</th>
<th></th>
<th></th>
<th></th>
<th>Households Led by Unpartnered Women</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>H. pylori(^+)</td>
<td>Odds Ratio [95% CI]</td>
<td>n</td>
<td>H. pylori(^+)</td>
<td>Odds Ratio [95% CI]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>47</td>
<td>32%</td>
<td>2.0 [0.9, 4.5]</td>
<td>6</td>
<td>33%</td>
<td>4.2 [0.5, 33]</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>78</td>
<td>19%</td>
<td>1.0 --</td>
<td>28</td>
<td>10%</td>
<td>1.0 --</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>61</td>
<td>46%</td>
<td>3.6 [1.7, 7.6]</td>
<td>17</td>
<td>65%</td>
<td>15 [3.2, 73]</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>56</td>
<td>50%</td>
<td>4.2 [1.9, 9.1]</td>
<td>11</td>
<td>64%</td>
<td>15 [2.6, 81]</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>22</td>
<td>45%</td>
<td>3.5 [1.3, 9.6]</td>
<td>8</td>
<td>50%</td>
<td>8.3 [1.3, 52]</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>264</td>
<td>36%</td>
<td></td>
<td>70</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Pilot Data Analysis: Food Security

<table>
<thead>
<tr>
<th>Food Security</th>
<th>All Households</th>
<th></th>
<th>Households Led by Unpartnered Women</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>---</td>
</tr>
<tr>
<td>Never insecure</td>
<td>227</td>
<td>84%</td>
<td>57</td>
<td>81%</td>
<td>---</td>
</tr>
<tr>
<td>Sometimes insecure</td>
<td>32</td>
<td>12%</td>
<td>8</td>
<td>11%</td>
<td>---</td>
</tr>
<tr>
<td>Often insecure</td>
<td>11</td>
<td>4%</td>
<td>5</td>
<td>7%</td>
<td>---</td>
</tr>
<tr>
<td>TOTAL</td>
<td>270</td>
<td>70%</td>
<td>70</td>
<td>70%</td>
<td>---</td>
</tr>
</tbody>
</table>
Very strong association between Severe Food Insecurity and *H. pylori* Prevalence

- Association strong in women (OR: 10, [1.2, 90])
- Also strong in households led by unpartnered women, though estimates are imprecise due to small numbers

<table>
<thead>
<tr>
<th>Food Security</th>
<th>All Households</th>
<th></th>
<th>Households Led by Unpartnered Women</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td><em>H. pylori</em>+</td>
<td>Odds Ratio [95% CI]</td>
<td>n</td>
</tr>
<tr>
<td>Never Insecure</td>
<td>227</td>
<td>34%</td>
<td>1.0 --</td>
<td>57</td>
</tr>
<tr>
<td>Sometimes Insecure</td>
<td>32</td>
<td>38%</td>
<td>1.2 [0.5, 2.6]</td>
<td>8</td>
</tr>
<tr>
<td>Often Insecure</td>
<td>11</td>
<td>91%</td>
<td>20 [2.5, 158]</td>
<td>5</td>
</tr>
</tbody>
</table>
Future Directions

- At least 200 households to be added to dataset
- Data analysis, with adjustment for confounding
- Consult planning committees for interpretation of results
- Results dissemination
Acknowledgements

RESEARCH PROGRAM SUPPORT
University of Alberta
Inuvialuit Regional Corporation
CIHR
Alberta Innovates
ArcticNet
Canadian North
Olympus Canada

TRAINING GRANTS
UALBERTA NORTH
UANRA Award

POLAR KNOWLEDGE CANADA
NSTP Award

JOHN COPELAND, CDC
Epi Info Developer & Form Debugger

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AMRIT PASSI, Data Collection
KATHY GILMORE, Data Collection

PROJECT PARTICIPANTS
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River, Inuvik, Pelly Crossing, Carmacks
Mahsi Cho

QUESTIONS?