Perceptions about environmental sources of *Helicobacter pylori* infection in a Canadian Arctic community

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*Helicobacter pylori*

- Helical, flagellar, gram-negative, bacterium that inhabits the lining of the stomach and/or duodenum

Photo from Blaser *Sci Am* Feb 1996, pp. 104-7
About *H. pylori*

- Infects half or more of the world population, in some communities more than in others
- Most people with *H. pylori* get it in childhood; some people stay infected throughout their lives
- People living in crowded conditions are more likely to have it
- Can cause chronic gastritis, peptic ulcer disease, and stomach cancer
Mode of transmission remains uncertain

- Extensive research on transmission suggests that *H. pylori* usually spreads directly from person to person, perhaps most readily during bouts of acute gastroenteritis with vomiting and/or diarrhea.

- Existing evidence neither confirms nor rules out an environmental reservoir; research so far has been inconclusive due to difficulties in culturing *H. pylori* from environmental sources.
H. pylori disproportionately affects Northern Aboriginal populations.
Little Data on *H. pylori*-associated Disease in Northern populations

### Peptic Ulcer Disease
- Studies from Labrador, Alaska, Greenland, and Norway show an increased occurrence of ulcers in the body of the stomach, which unlike ulcers in the duodenum, occur more frequently in populations with high rates of gastric cancer.

### Gastric Cancer
- Age adjusted incidence rate for NWT males 2x Canadian rate
- 4th most frequently diagnosed cancer in NWT males (3rd in Dene males, 2nd in Inuit males)
Communities in northern Canada were concerned about *H. pylori*

- Awareness that many people in the community have *H. pylori* infection
- Perceived high rates of gastric cancer
- Frequent failure of *H. pylori* therapy in this region
- Other health risks

- Frequently voiced local concerns focus on the worry that *H. pylori* infection comes from drinking water sources
CANHelp *(Canadian North Helicobacter pylori)* Working Group

- Multidisciplinary team was formed
  - Community organizations
  - Regional agencies
  - Alberta Health Services
  - University of Alberta
    - Epidemiology
    - Gastroenterology
    - Microbiology
    - Pathology
    - Health Policy
    - Anthropology
CANHelp Working Group-Aims

• To address community concerns about health risks from *H. pylori* infection

• To recommend *H. pylori* management strategies to health authorities

• To reduce health risks from *H. pylori* infection
Aklavik H. pylori Project
Hamlet of Aklavik, Northwest Territories, Canada

2006 population: 590
90% Aboriginal: Inuvialuit (Inuit) or Gwich’in Dene (First Nation)
I was going to suggest that for an international audience, you might want an inset or previous slide that shows where Canada is in the world, or North America, or the circumpolar north. But I see your next slide does that - very nice touch to show it in relation to where you will be presenting this. Perhaps that slide should come first? Not sure - maybe seek feedback from a practice audience.

Karen Goodman, 14/05/2010
Aklavik *H. pylori* Project Specific Aims:

- Investigate *H. pylori* infection in Aklavik
  - Screen residents for *H. pylori* infection, family history, symptoms, current awareness of *H. pylori* infection
    - Describe local perceptions and knowledge about *H. pylori* in order to guide further research and knowledge exchange and inform policy.
  - Collect epidemiologic data on risk factors
  - Evaluate effectiveness of anti-*H. pylori* therapies
  - Follow those treated long-term to identify factors associated with treatment failure and reinfection
321 were tested for *H. pylori* by the breath test:

58% were positive for *H. pylori*  
(95% confidence interval [52-63])
Prevalence of *H. pylori* infection by age among 316 Aklavik residents screened by UBT (with age data)
Prevalence of *H. pylori* infection by ethnicity among 293 UBT-screened Aklavik residents (with ethnicity data)

![Bar chart showing prevalence](chart.png)

- **Aboriginal**
  - n=253
  - 63%

- **Non-Aboriginal**
  - n=40
  - 23%
### Pathology Results

<table>
<thead>
<tr>
<th></th>
<th>All H. pylori Positive (n=129)</th>
<th>All Participants (n=194)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inflammation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mild (%)</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Moderate (%)</td>
<td>47</td>
<td>31</td>
</tr>
<tr>
<td>Severe (%)</td>
<td>43</td>
<td>29</td>
</tr>
<tr>
<td>Atrophy (%)</td>
<td>21</td>
<td>14</td>
</tr>
<tr>
<td>Intestinal Metaplasia (%)</td>
<td>11</td>
<td>8</td>
</tr>
</tbody>
</table>

- This frequency of severe inflammation is uncommon
- Atrophy and metaplasia are considered precancerous
Aklavik *H. pylori* Project Specific Aims:

- Although research worldwide has not identified an environmental reservoir as a major mode of *H. pylori* transmission, frequently voiced local concerns focus on the worry that *H. pylori* infection comes from contaminated drinking water sources. This analysis aims to describe local understandings of *H. pylori* as related to environmental factors in order to guide further research and knowledge exchange.
Questionnaire items: knowledge of *H. pylori* and reasons for community concern

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>Unsure / don’t remember</th>
<th>Refused to answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Have you heard of <em>Helicobacter pylori</em> or <em>H. pylori</em> infection?</td>
<td>162</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>If yes:</td>
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<tr>
<td>2a. Can you tell me what kind of illness it causes as far as you know or from what you have heard?</td>
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<td>Yes; specify all the illnesses:</td>
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<tr>
<td>No</td>
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<td>Unsure / don’t remember</td>
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<tr>
<td>Refused to answer</td>
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<tr>
<td>2b. Do you know or have an idea about how people get it?</td>
<td>80</td>
<td></td>
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<td>Yes; specify:</td>
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<tr>
<td>No</td>
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<td>Unsure / don’t remember</td>
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<tr>
<td>Refused to answer</td>
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<td>2c. How did you find out about <em>H. pylori</em> infection? (mark all that apply)</td>
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<td>TV/Radio</td>
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<td>Health Centre</td>
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<tr>
<td>Family members who had it</td>
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<tr>
<td>Friends who had it</td>
<td></td>
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<tr>
<td>Other; specify:</td>
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<tr>
<td>Unsure / don’t remember</td>
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<tr>
<td>Refused to answer</td>
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</tbody>
</table>

3. Do you believe *H. pylori* infection is a community concern?

| Yes: please specify the main reason for concern:                          | |
| No                                                                       | |
| Unsure / don’t remember                                                | |
| Refused to answer                                                      | |

- 344 of Aklavik’s 590 residents participated in survey
- 298 were age 12+ (responded on their own)
Have you heard of *Helicobacter pylori* or *H. pylori* infection?

- Of the 298 respondents aged 12+ years, 162 (54% [49-60]) indicated they had heard of *H. pylori* infection.
Do you know or have an idea of how people get it?

- 80 of 160 (50% [42-58]) indicated they had an idea of how people get it

![Bar chart showing categorized responses of individuals who responded that they had an idea of how they get H. pylori (n=80).](chart.png)

Figure 2- Categorized responses of individuals who responded that they had an idea of how people get *H. pylori* (n=80)
Do you believe *H. pylori* infection is a community concern?

- Of the 298 respondents, 228 (77% [71-81]) agreed that *H. pylori* is a community concern. 188 respondents stated one or more reasons for concern.

Figure 3- Categorized responses of individuals who indicated they thought *H. pylori* a community concern and gave a reason (n=188)
The table and the graph are too much for one slide. Either drop one or the other - or show them on separate slides.

Karen Goodman, 14/05/2010

Also, consider putting this bullet on its own slide as two bullets, preceding the table/graph.

Karen Goodman, 14/05/2010
Summary

- Most participants who had an idea about where *H. pylori* comes from mentioned the local water as a potential source.

- Many people stated that *H. pylori* is a community concern because "its in the water", reflecting the importance Aklavik residents place on water quality as an environmental health issue.

- Important implications for developing effective prevention strategies.

- Knowledge exchange strategies are needed to address the perception that *H. pylori* infection comes from contaminated water, and the contrast between this perception and what current scientific evidence suggests.
Funding agencies and sponsors

- Alberta Heritage Foundation for Medical Research
- Canadian Association for Gastroenterology with Canadian Institutes for Health Research & Industry Partners
- Social Sciences and Humanities Research Council of Canada
- Public Health Agency of Canada
- Indian and Northern Affairs Canada
- Canadian Circumpolar Institute
- Anisnawbe-Kekendazone (NEAHR-Ottawa)
- Nasivvik
- ArcticNet
Ask Janis for her updated slide of sponsors.
Karen Goodman, 14/05/2010
Questions?

Aklavik, NWT
2:30 am, June 2, 2009