



# Endoscopic and histopathologic characteristics of *Helicobacter pylori* infection in a Canadian Arctic hamlet

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&

CANHelp (Canadian North *Helicobacter pylori*) Working Group



# Research Context

- Aboriginal communities in Yukon and Northwest Territories express concern about health risks from *H. pylori* infection and seek research to find solutions
- Northern Canadian health authorities seek information
  - to improve clinical management of *H. pylori* infection given perception of frequent treatment failure
  - to inform public health policy related to *H. pylori* infection
- Northern communities are remote with respect to advanced medical services

# Project Goals



- Address community concerns
- Describe the *H. pylori*-associated disease burden
- Reduce health risks from *H. pylori* infection

# Research Questions

- To achieve project goals, the following information is needed for targeted communities:
  - How widespread is the infection?
  - What environmental factors are associated with it?
  - What health problems result from it?
  - Who requires medical care related to it?
  - What are the best ways to treat it?
  - How can it be assessed in remote communities?
  - How can communities be protected from it?
  - How can communities understand the obstacles to finding and implementing effective solutions?
  - How can communities recognize benefits from research on community health problems that may be difficult to solve?

# **CANHelp** (Canadian North *Helicobacter pylori*) **Working Group**

## **Community Organizations**

- Aklavik Health Committee
- Billie Archie, Arctic Health Research Network, Aklavik Chapter
- Crystal Lennie, Inuvialuit Regional Corporation

## **NWT Agencies**

- Rachel Munday, Nurse in Charge, Aklavik Health Center
- Leah Seaman, Public Health Physician, Beaufort-Delta Regional Health Authority
- Andre Corriveau, Former Chief Medical Officer, NWT Health and Social Services
- John Morse, Former Medical Director, Stanton Territorial Health Authority
- Susan Chatwood, Director, NWT Arctic Health Research Network

## **Alberta Health Services**

- Robert Bailey, Director, Northern Health Services Network

## **University of Alberta**

- Principal Investigator, Epidemiology: Karen Goodman
- Gastroenterology: Sander van Zanten, Justin Cheung, Amy Morse, Richard Fedorak
- Microbiology: Monika Keelan, Joanne-Simala Grant
- Pathology: Safwat Girgis
- Anthropology: Christopher Fletcher
- Health Policy: Carl Phillips



# Aklavik *H. pylori* Project Aims

## Investigate *H. pylori* infection in Aklavik

- Screen residents for *H. pylori* infection, family history, symptoms
- Collect epidemiologic data on risk factors for *H. pylori* infection
- Offer upper endoscopy to:
  - Estimate the prevalence of endoscopically significant abnormalities
  - Obtain biopsies to:
    - Estimate the prevalence of bacterial resistance to antibiotics and bacterial virulence factors
    - Characterize histopathology in relation to *H. pylori* infection
- Evaluate the effectiveness of anti-*H. pylori* therapies
- Follow those treated long-term to identify factors associated with treatment failure and reinfection





**AKLAVIK**

Yukon Territory

Whitehorse

Northwest Territories

Yellowknife

Nunavut

Iqaluit

British Columbia

Alberta

Edmonton

Saskatchewan

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Québec

Ottawa

Toronto

Newfoundland and Labrador

Fredericton

New Brunswick

Charlottetown

Nova Scotia

Prince Edward Island

Halifax

St. John's

Victoria

# Study Community: Aklavik, NWT

- 2004 population: 631
  - 90% Inuvialuit (Inuit) or Gwich'in Dene (First Nation)
- Access
  - Reached only by air or by winter ice-road from Inuvik

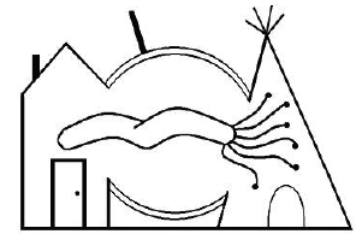




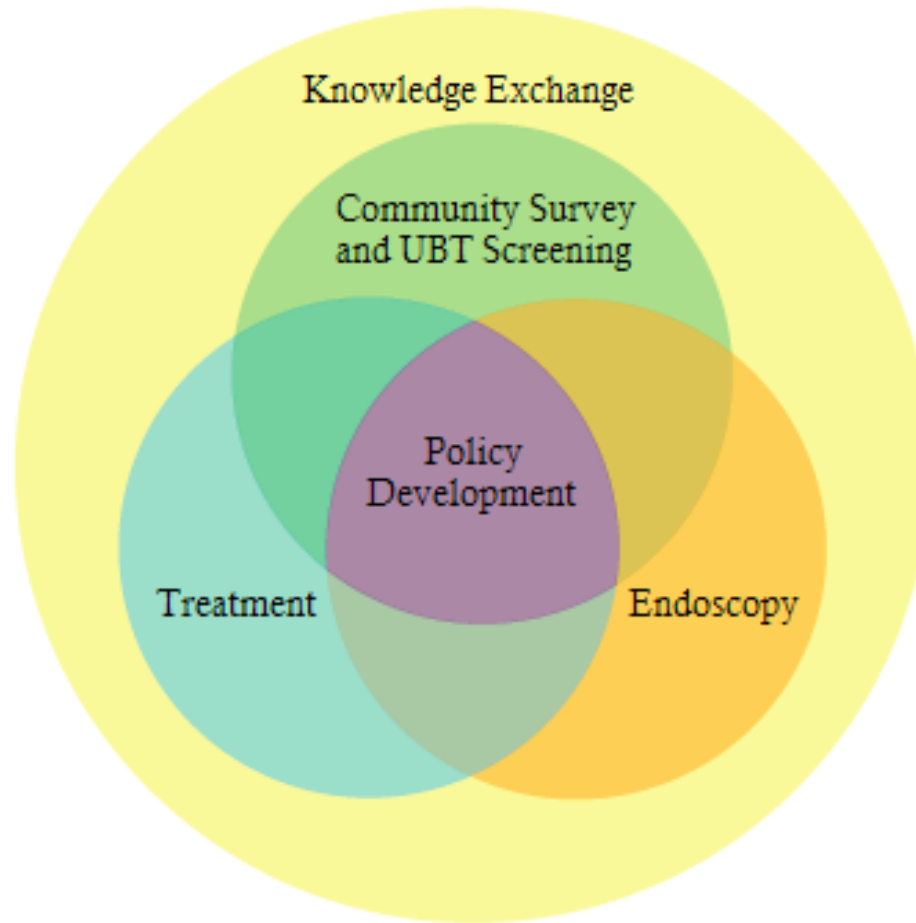
# Aklavik Health Centre

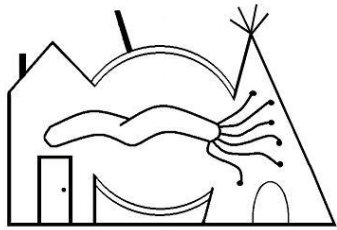


# Overview: Aklavik *H. pylori* Project



Aklavik *H. pylori* Project





Aklavik *H. pylori* Project

# Aklavik *H. pylori* Project Endoscopy





# Aklavik *H. pylori* Project

## Endoscopy

- Enrollment

- A Study Planning Committee based in Aklavik guided researchers
- Decided everyone in the community who was age-eligible should have the opportunity to be scoped
- Age minimum, 10, was determined by the planning committee and NWT health authorities
- Aklavik residents  $\geq 15$  were targeted and younger children were allowed to enrol at parents' request
- Separate informed consents were completed for this component of the project, as well as child assents to accompany parental consents for children  $< 17$  years



# Aklavik *H. pylori* Project

## Endoscopy

- Endoscopies
  - Performed in February 2008 by visiting gastroenterologists
  - Equipment transported temporarily to the Aklavik Health Center
  - Transnasal ultrathin gastroscopes used for the procedure, majority done without sedation
  - 5 gastric biopsies obtained from each participant (2 antrum, 2 corpus & 1 incisura) for histopathology





# Aklavik *H. pylori* Project

## Endoscopy

- Biopsies

- 4-6 per patient, 93% had  $\geq 5$
- Size ranged from 2mm-4.5mm, mean 2.9mm
- Pathologist judged nearly all of optimal quality (each participant had multiple biopsies of optimal quality)
- Processed with H&E and Giemsa stains
- Evaluated microscopically by a single pathologist using the updated Sydney system





# Aklavik *H. pylori* Project

## Endoscopy

- Biopsies were obtained from **194** individuals (42% male)
- Participants were primarily Inuvialuit (Inuit) or Gwich'in Dene (Athabaskan First Nations)
- Participants were aged 10-80

Ethnicity	<i>n</i>
Gwich'in	53
Inuvialuit	114
Other Aboriginal	8
Non-Aboriginal	18
Missing	1

Age (years)	<i>n</i>
10-17	19
18-29	42
30-49	75
50-69	47
70-80	11



# Aklavik *H. pylori* Project

## Endoscopic Abnormalities

- Of 194 scoped persons, percent with:
  - Apparent inflammation
    - Gastritis 13.8%
    - Duodenitis 6.7%
  - Erosions
    - Gastric 6.2%
    - Duodenal 0.5%
  - Ulcers
    - Gastric 3.1%
    - Duodenal 0
  - Cancers 0
  - *Esophagitis* 10.4%
  - *Barrett's Esophagus* 2.6%



# Aklavik *H. pylori* Project

## Histopathology





# Aklavik *H. pylori* Project

## Histopathology

- Prevalence of *H. pylori*

	<i>n</i>	<i>H. pylori</i> + % (95% CI)
Inuvialuit	114	70 (61-78)
Gwich'in	53	70 (56-82)
Non-aboriginal	18	22 (6-48)
All participants	194	67 (59-73)



# Aklavik *H. pylori* Project

## Histopathology

- Prevalence of selected histopathology classifications

	<b>All <i>H. pylori</i>+</b>	All participants
<i>n</i>	<b>129</b>	194
Inflammation		
Mild (%)	<b>8</b>	7
Moderate (%)	<b>47</b>	31
Severe (%)	<b>43</b>	29
Atrophy (%)	<b>21</b>	14
Intestinal Metaplasia (%)	<b>11</b>	8



# Aklavik *H. pylori* Project

## Histopathology

- Prevalence of selected histopathology classifications grouped by ethnicity

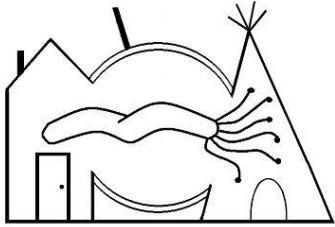
		<i>n</i>	Severe Inflammation % (95% CI)	Atrophy % (95% CI)	Intestinal Metaplasia % (95% CI)
Aboriginal	total	176	31 (24-38)	14 (9-20)	9 (5-14)
	<i>H. pylori</i> +	125	43 (34-52)	20 (13-28)	10 (6-17)
Non-aboriginal	total	18	11 (1-35)	11 (1-35)	6 (0-27)





# Aklavik *H. pylori* Project Summary

- Aboriginal residents of Aklavik, NWT have a high prevalence of *H. pylori* infection with elevated frequencies of:
  - Erosions and ulcers of the gastric corpus relative to the duodenum
  - Severe gastric inflammation
  - Gastric atrophy
  - Intestinal metaplasia



Aklavik *H. pylori* Project

# Aklavik *H. pylori* Project

## Conclusions

- Endoscopic and histopathologic evaluation of Aboriginal residents of Aklavik, NWT shows a pattern consistent with an elevated risk of gastric cancer
- This assessment suggests that community worries over cancer risks from *H. pylori* infection are well-placed
- The Aklavik *H. pylori* Project will develop knowledge exchange strategies that help community members understand *H. pylori* health risks as well as currently available solutions and unsolved challenges for reducing these health risks
- This research will expand to other northern Canadian Aboriginal communities to obtain representative data for informing regional health policy aimed at reducing health risks from *H. pylori* infection

# Aklavik Project Funding Agencies

- Alberta Heritage Foundation for Medical Research
- Canadian Association for Gastroenterology with Canadian Institutes for Health Research / AstraZeneca
- Social Sciences and Humanities Research Council of Canada
- Public Health Agency of Canada
- Indian and Northern Affairs Canada
- Canadian Circumpolar Institute

# Aklavik Project Supporters

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**Inuvialuit Regional Corporation**

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