

# Community-driven research on *Helicobacter pylori* infection in Arctic Canada

Update from the Canadian North *Helicobacter pylori* Working Group



Karen J Goodman

Ali Assi

Brendan Hanley

**CAN Help**  
WORKING GROUP

# CANHelp Working Group

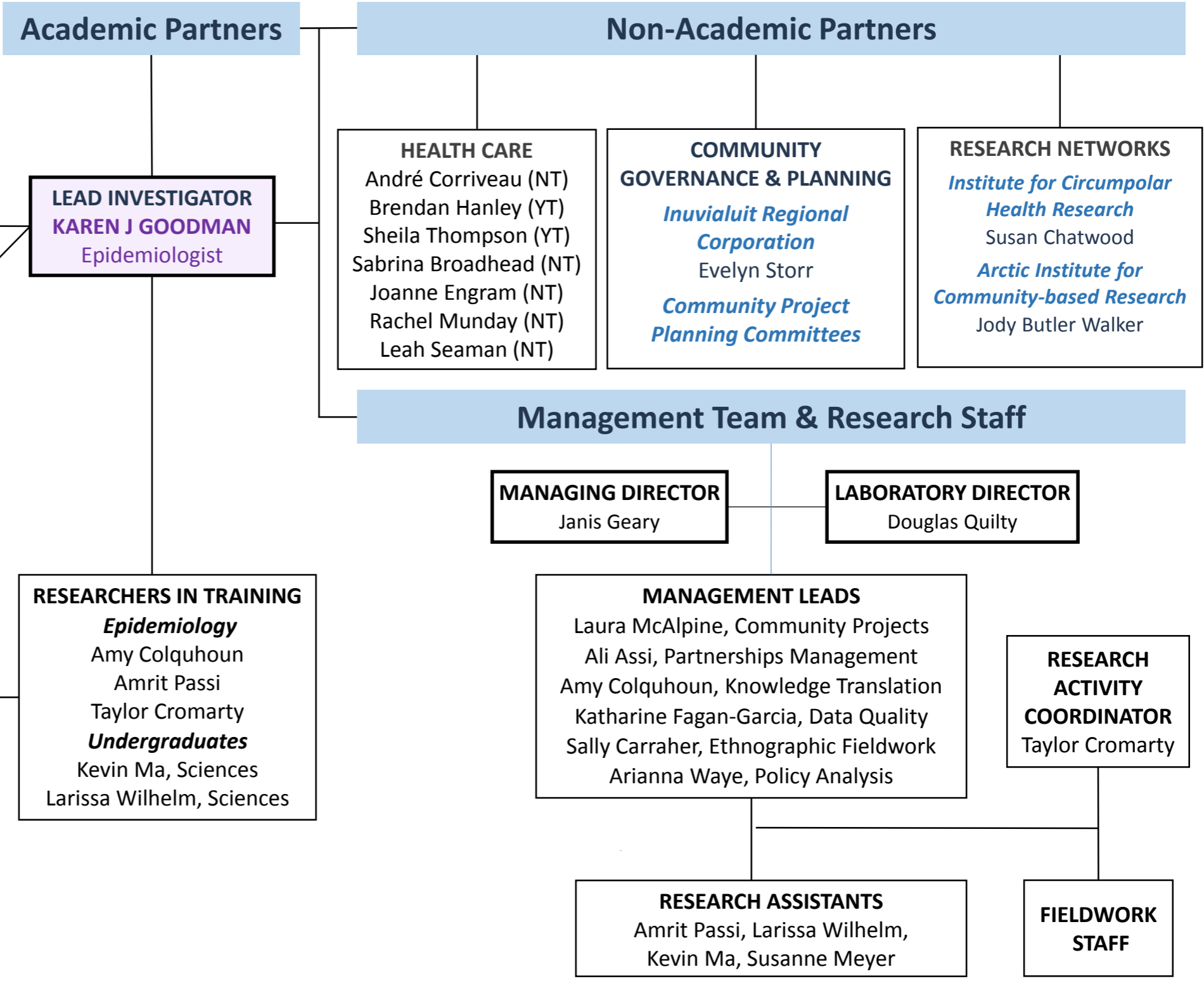


## Canadian North *Helicobacter pylori* (CANHelp)

- Arose from a collaboration that formed during 2006-2008 in response to:
  - Communities concerned about health risks
  - Health care providers seeking to improve clinical management
  - Public health officials seeking evidence to inform health policy



# Organizational Chart



**Academic Partners**

**Non-Academic Partners**

**LEAD INVESTIGATOR**  
**KAREN J GOODMAN**  
Epidemiologist

**SCIENTIFIC ADVISORS**  
Michael Bruce, CDC Alaska  
Richard Fedorak, UA CEGIIR  
David Forman, IARC, WHO  
Sanford Dawsey, NCI, NIH

**HEALTH CARE**  
André Corriveau (NT)  
Brendan Hanley (YT)  
Sheila Thompson (YT)  
Sabrina Broadhead (NT)  
Joanne Engram (NT)  
Rachel Munday (NT)  
Leah Seaman (NT)

**COMMUNITY GOVERNANCE & PLANNING**  
*Inuvialuit Regional Corporation*  
Evelyn Storr  
*Community Project Planning Committees*

**RESEARCH NETWORKS**  
*Institute for Circumpolar Health Research*  
Susan Chatwood  
*Arctic Institute for Community-based Research*  
Jody Butler Walker

**Management Team & Research Staff**

**MANAGING DIRECTOR**  
Janis Geary

**LABORATORY DIRECTOR**  
Douglas Quilty

**RESEARCHERS IN TRAINING**  
*Epidemiology*  
Amy Colquhoun  
Amrit Passi  
Taylor Cromarty  
*Undergraduates*  
Kevin Ma, Sciences  
Larissa Wilhelm, Sciences

**MANAGEMENT LEADS**  
Laura McAlpine, Community Projects  
Ali Assi, Partnerships Management  
Amy Colquhoun, Knowledge Translation  
Katharine Fagan-Garcia, Data Quality  
Sally Carraher, Ethnographic Fieldwork  
Arianna Waye, Policy Analysis

**RESEARCH ACTIVITY COORDINATOR**  
Taylor Cromarty

**SENIOR INVESTIGATORS**  
Sander Van Zanten, Gastroenterology  
Safwat Girgis, Pathology  
Monika Keelan, Microbiology  
Yutaka Yasui, Biostatistics  
Christopher Fletcher, Anthropology  
Philip Jacobs, Health Economics  
Cindy Jardine, Risk Communication  
**JUNIOR INVESTIGATORS**  
Janis Geary, Science Policy  
Sally Carraher, Anthropology  
Arianna Waye, Policy Sciences  
Amy Morse, Gastroenterology  
Cheryl Currie, Social Epidemiology

**RESEARCH ASSISTANTS**  
Amrit Passi, Larissa Wilhelm,  
Kevin Ma, Susanne Meyer

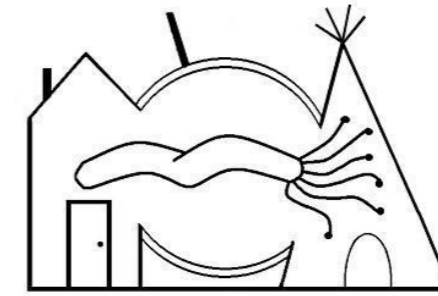
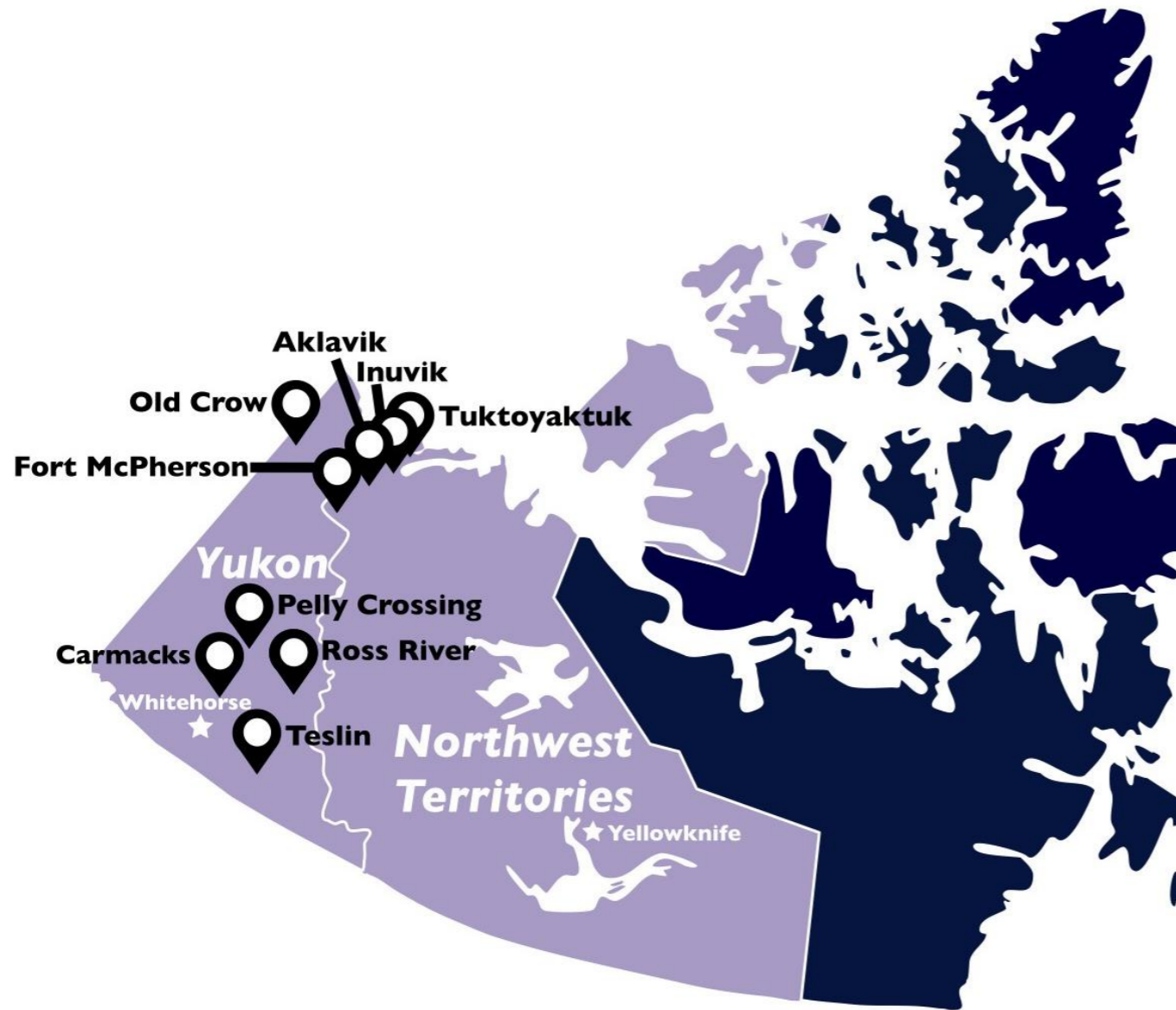
**FIELDWORK STAFF**

# Project Components

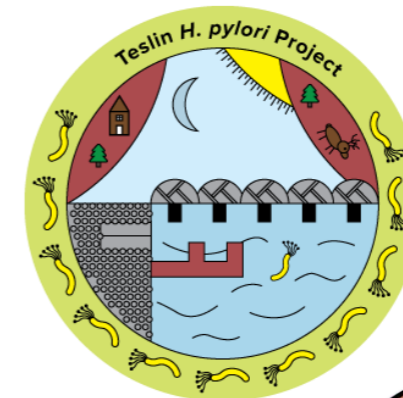
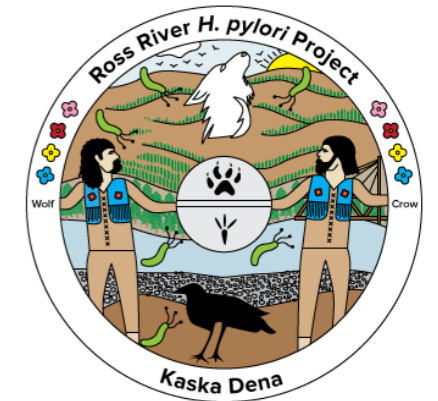
- Guided by a project planning committee in each community
  - *H. pylori* screening by urea breath test
  - Participant interviews
  - Endoscopy
  - Treatment
  - Longitudinal follow-up
  - Policy development
  - Knowledge exchange



# Participating Communities



Aklavik H. pylori Project



# Participating Communities



## New Community Projects

### UBT SCREENING

Pelly Crossing, YT: October 2017

Carmacks, YT: November 2017

### LONG TERM UBT FOLLOW-UP, February 2018

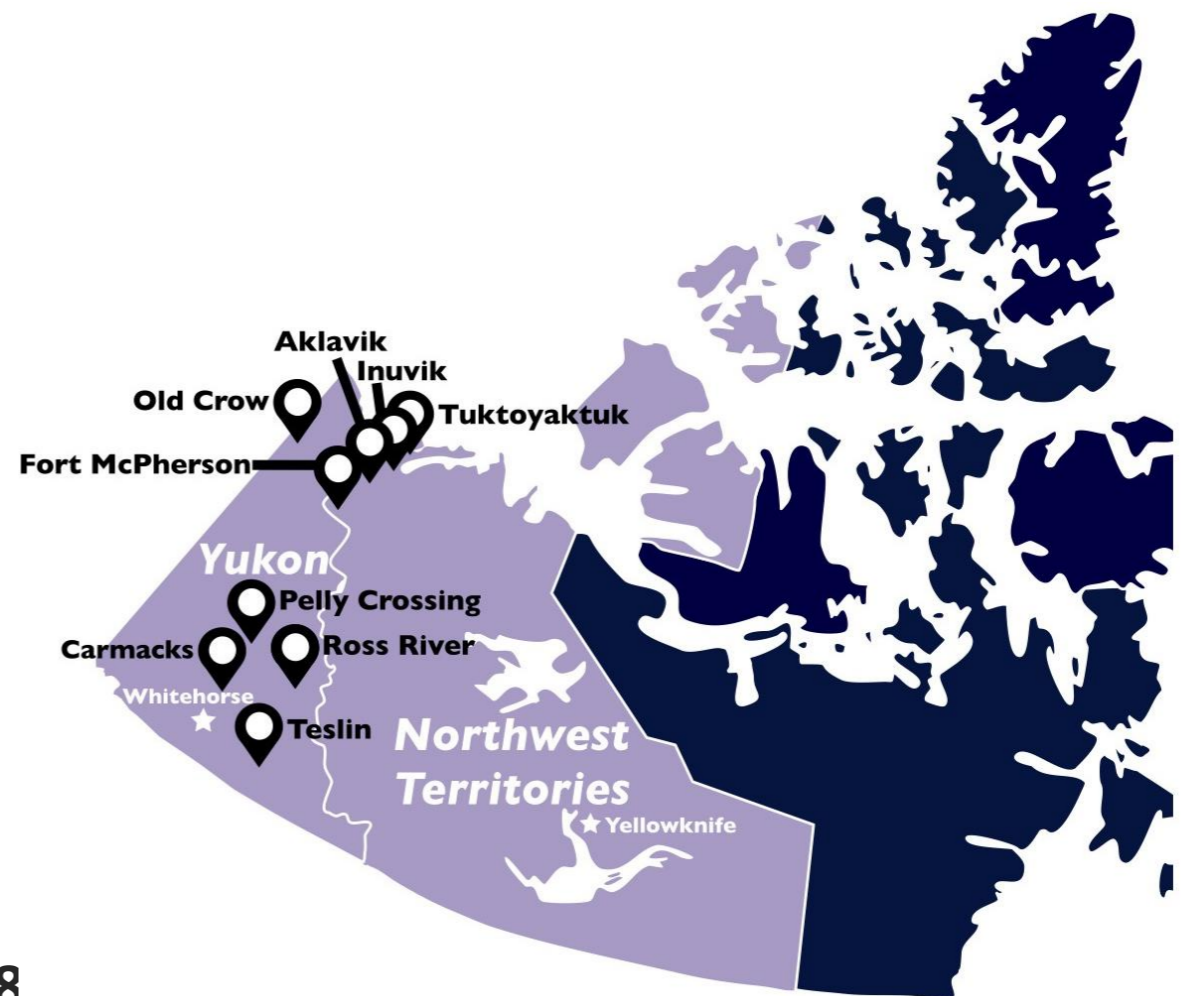
Fort McPherson, NT

### ENDOPSCOPY, March 2018

Inuvik, NT

### LONG TERM ENDOSCOPY FOLLOW-UP, March 18

Fort McPherson, NT



# Project Participation



Community Projects		Launch Year	Participants	Breath Tests	Endoscopy
<b>Aklavik</b>	(Population ~590)	2007	392	337	195
<b>Old Crow</b>	(Population ~250)	2010	208	199	64
<b>Tuktoyaktuk</b>	(Population ~900)	2011	107	104	13
<b>Fort McPherson</b>	(Population ~800)	2012	235	226	57
<b>Ross River</b>	(Population ~290)	2016	107	104	25
<b>Teslin</b>	(Population ~260)	2016	124	123	25
<b>Inuvik</b>	(Population ~3,200)	2017	127	125	22
<b>Pelly Crossing</b>	(Population ~290)	2017	56	56	N/A
<b>Carmacks</b>	(Population ~490)	2017	64	62	N/A
<b>TOTAL</b>			<b>1420</b>	<b>1336</b>	<b>401</b>

# Project Participation



---

<b>Participants Recruited</b>	1420
<b>Health Surveys Completed</b>	1229
<b>Participant Surveys Completed</b>	927
<b>Household Surveys Completed</b>	696
<b>Endoscopies Completed</b>	399
<b>Assigned Treatment in Trial</b>	396

---



# *H. pylori* Infection Prevalence in Project Participants



Community	Year	<i>H. pylori</i> prevalence (by UBT)	
		Number with results	% positive
<b>Northwest Territories</b>			
Aklavik	2008	336	58
Tuktoyaktuk	2011	102	57
Ft McPherson	2012	212	59
Inuvik	2017	124	25
<b>Yukon</b>			
Old Crow	2010	192	67
Ross River	2016	102	45
Teslin	2016	120	38
Pelly Crossing	2017	56	48
Carmacks	2017	60	45
<b>TOTAL</b>		<b>1304</b>	<b>52</b>
Indigenous		1044	59
Non-Indigenous		197	16

# *H. pylori*-related Disease in Community Project Participants



Prevalence of Endoscopic Diagnoses  
*among 394 participants who had upper GI endoscopy*

	n	% of 394
Gastritis	61	15
Gastric Erosions	33	8
Gastric Ulcer	10	3
Duodenitis	27	7
Duodenal Erosions	3	1
Duodenal Ulcer	4	1

## **Highlights:**

3:1 ratio, gastric to duodenal ulcer

More frequent gastric than duodenal disease

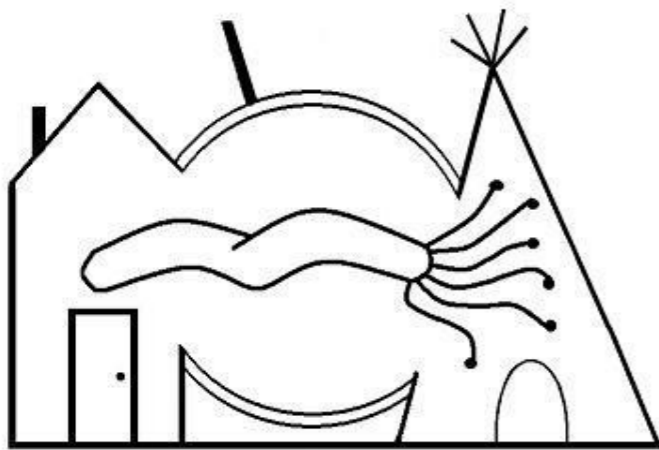
***Pattern consistent with increased risk of gastric cancer***



# **Gastric Pathology Follow-up Study in Canadian Arctic Communities**

# Objectives

- To describe changes in gastric pathology in *CANHelp* community project participants who completed upper gastrointestinal endoscopy at baseline and several years after treatment for *H. pylori* infection.
- Data from:
  - Aklavik *H. pylori* Project
  - Old Crow *H. pylori* Project
  - Fort McPherson *H. pylori* Project



Aklavik *H. pylori* Project



# Study Population



- **Upper gastrointestinal endoscopy at baseline**
  - Held in mobile units set up in Aklavik (2008), Old Crow (2012) and Fort McPherson (2013)
  - 5-6 gastric biopsies per participant for histopathology assessment using Sydney System
- **Treatment for *H. pylori* infection**
  - *H. pylori*-positive participants received treatment followed by a urea breath test (UBT) at  $\geq 8$  weeks after treatment to assess treatment success
- **Follow-up endoscopy in 2017**
  - 6 gastric biopsies per participant for histopathology using Sydney System

# Demographic characteristics at baseline and follow-up endoscopy



	Baseline (2008-2013)		Follow-up (2017)	
	n	%	n	%
<b>Total</b>	308	100	62	100
<b>Sex</b>				
Male	137	44	23	37
Female	171	56	39	63
<b>Ethnicity</b>				
Non-Indigenous	22	8	2	3
Inuvialuit	121	41	26	44
Gwich'in	133	45	30	50
Other*	17	6	2	3
<b>Age at endoscopy (years)</b>				
<30	75	24	3	5
30 to 59	174	56	39	63
60+	59	19	20	32

\*excluding missing data

# Prevalence of abnormal histopathology at baseline and follow-up endoscopy

	Baseline (2008-2013) (n=308)			Follow-up (2017) (n=62)		
	n	%	95% CI	n	%	95% CI
<b><i>H. pylori</i> infection</b>	222	72	67, 77	17	27	17, 40
<b>Active gastritis</b>						
Mild	104	34	29, 39	11	18	9, 30
Moderate	81	26	21, 32	16	26	16, 38
Severe	32	10	7, 14	0	0	0, 5
<b>Chronic gastritis</b>						
Mild	27	9	6, 12	11	18	9, 30
Moderate	100	32	27, 38	10	16	8, 28
Severe	106	34	29, 40	3	5	1, 13
<b>Atrophic gastritis</b>	95	31	26, 36	10	16	8, 28
<b>Intestinal metaplasia</b>	44	14	11, 19	10	16	8, 28

# Within-individual change in gastritis severity by *H. pylori* (Hp) infection status



*Participants not treated in study period*

	Baseline (2008-2013)	Hp (+)		Hp (-)	
	Follow-up	Hp (+) n = 3	Hp (-) n = 2	Hp (+) n = 1	Hp (-) n = 13
<b>Chronic gastritis</b>					
None at both times		0	0	0	9
Lower		0	2	0	1
Unchanged		2	0	0	0
Higher		1	0	1	3
<b>Active gastritis</b>					
None at both times		0	0	0	13
Lower		0	2	0	0
Unchanged		2	0	0	0
Higher		1	0	1	0



# Within-individual change in *chronic* gastritis severity

by *H. pylori* (Hp) infection status



	Baseline (2008-2013) Follow-up (2017)	Hp (+)			
		Hp (+)		Hp (-)	
		%	95% CI	%	95% CI
<b><i>Negative UBT ≥8 weeks after treatment</i></b>		<b>n = 6</b>		<b>n = 24</b>	
None at both times		0	-	0	-
Lower		33	4, 78	100	88, 100
Unchanged		67	22, 96	0	-
Higher		0	-	0	-
<b><i>Positive or uncertain UBT ≥8 weeks after treatment</i></b>		<b>n = 7</b>		<b>n = 6</b>	
None at both times		0	-	0	-
Lower		57	18, 90	100	61, 100
Unchanged		29	4, 71	0	-
Higher		14	0.4, 58	0	-

# Within-individual change in *active* gastritis severity

by *H. pylori* (Hp) infection status



	Baseline (2008-2013) Follow-up (2017)	Hp (+)		Hp (-)	
		%	95% CI	%	95% CI
<b><i>Negative UBT ≥8 weeks after treatment</i></b>		<b>n = 6</b>		<b>n = 24</b>	
None at both times		0		4	0.1, 21
Lower		33	4, 78	96	79, 100
Unchanged		50	12, 88	0	-
Higher		17	0.4, 64	0	-
<b><i>Positive or uncertain UBT ≥8 weeks after treatment</i></b>		<b>n = 7</b>		<b>n = 6</b>	
None at both times		0	-	0	-
Lower		29	4, 71	100	61, 100
Unchanged		57	18, 90	0	-
Higher		14	0.4, 58	0	-

# Conclusion

- Most participants who were successfully treated remained free of *H. pylori* infection for several years after treatment.
- All who remained infection-free at follow-up had decreased severity of both active and chronic gastritis, though small study size must be considered.



# Acknowledgements



**Inuvialuit Regional Corporation**

