

# Hygienic behaviors and prevalence of *Helicobacter pylori* infection in Aklavik, Northwest Territories, Canada

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The Aklavik *H. pylori* Project is part of community-driven research carried out by the Canadian North *Helicobacter pylori* (CANHelp) Working Group, which aims to reduce health risks from *Helicobacter pylori* (*Hp*) infection in Arctic Canada (1). *Hp* is a bacterium that colonises the stomach where it can persist, leading to chronic gastritis and contributing to the development of peptic ulcer and gastric cancer (2). Increased *Hp* prevalence in Arctic Aboriginal populations, including Aklavik, is of public health importance due to the elevated rate of adverse health effects related to *Hp* in these communities (3). *Hp* is believed to spread directly from person to person, although the relative importance of oral–oral, gastric–oral and faecal–oral routes is unclear. One aim of the Aklavik *H. pylori* Project was to identify factors associated with *Hp* infection in the community. This analysis estimates association of hygienic behaviors with *Hp* prevalence in project participants.

## Methods

The Aklavik *H. pylori* Project uses a community-based participatory approach. All residents of Aklavik, Northwest Territories, were eligible to participate. During 2008–2010, participants were tested for prevalence of *Hp* infection by urea breath test or examination of gastric biopsies. Each participant was interviewed using a structured questionnaire, which included questions pertaining to hygienic behaviors, such as sharing of cups, sharing of dishes or bowls, having pre-chewed food as a baby, smoke sharing, frequency of bathing or showering, frequency of tooth brushing and frequency of mouthwash use. In addition, a representative of each household was interviewed using another structured questionnaire that included questions on household-level exposures. Logistic regression with random effects for household clustering was used to estimate odds ratios (OR) and 95% confidence intervals (CI) for associations of hygienic behaviors with individual *Hp* status, adjusting for age,

sex, ethnicity and household risk factors identified in prior analysis (the number of children in the house; highest education of a household member; car ownership; household use of river water for drinking; presence or evidence of mice in the house; and if the house was rented public housing). These factors were identified as having independent effects on individual prevalence. This study received ethical approval from the University of Alberta Health Research Ethics Board, and letters of support were received from the Hamlet of Aklavik, the Aklavik Community Corporation, and the Aklavik Indian Band and Ehdiiat Gwich'in Council. All statistical analysis was completed with STATA 11.0.

## Results

Among the total 354 participants, *Hp* prevalence was 61% (217/354), and among the 253 participants with complete data for this analysis, *Hp* prevalence was 63% (160/253). The overall pattern of the adjusted effect estimates showed frequent sharing behaviors associated with increased odds of *Hp* prevalence and frequent oral hygiene behaviors associated with decreased odds, although most of the variables examined did not show strong associations or consistent dose–response trends (Table I). The notable exceptions were frequencies of sharing smokes and mouthwash use. Participants who reported ever sharing anything smoked with 1 or more other people had twice the odds of *Hp* prevalence relative to participants who reported never sharing smokes (OR = 2.0, 95%CI = 0.9–4.5). Participants who reported using mouthwash once a day or more often had less than one-third the odds of *Hp* infection relative to those who used mouthwash less often or not at all (OR = 0.3, 95%CI = 0.1–0.9).

## Discussion

While not fully consistent, this analysis overall shows frequent sharing behaviors associated with increased odds of *Hp* infection and frequent oral hygiene behaviors

**Table 1.** Associations between hygienic behaviors and *Helicobacter pylori* infection status in Aklavik, Northwest Territories

	Total	Hp+ (%)	Unadjusted*		Adjusted <sup>#</sup>	
			OR	95% CI	OR	95% CI
Sharing cups (n = 253)						
Never	195	126 (65)	1.0		1.0	
Up to a few times per week	40	19 (48)	0.5	0.2–1.0	0.6	0.2–1.3
Every day	18	15 (83)	3.1	0.7–13	1.5	0.3–7.3
Sharing dishes or bowls (n = 253)						
Never	197	128 (65)	1.0		1.0	
Infrequently	26	13 (50)	0.5	0.2–1.3	0.7	0.3–1.8
A few times per month or more	30	19 (63)	0.8	0.3–2.3	1.1	0.4–3.0
Food pre-chewed as a baby (n = 173)						
No	42	20 (48)	1.0		1.0	
Yes	131	89 (68)	2.7	1.1–6.7	1.3	0.4–4.0
Smoke sharing (n = 208)						
No	142	82 (58)	1.0		1.0	
Yes	66	51 (77)	2.6	1.3–5.3	2.0	0.9–4.5
Showering or bathing (n = 253)						
A few times per week or less often	67	42 (63)	1.0		1.0	
Nearly every day or every other day	42	26 (62)	1.1	0.4–2.8	1.1	0.4–3.0
Every day	144	92 (64)	1.3	0.6–2.7	1.2	0.6–2.5
Tooth brushing (n = 242)						
Less than a few times per week	52	37 (71)	1.0		1.0	
1–2 times a day	158	101 (64)	0.8	0.4–1.6	1.0	0.5–2.3
After every meal or more often	32	16 (50)	0.4	0.1–1.1	0.6	0.2–1.8
Mouthwash use (n = 184)						
A few times per week or less often	135	95 (70)	1.0		1.0	
Once a day or more often	49	24 (49)	0.3	0.1–0.8	0.3	0.1–0.9

Hp, *Helicobacter pylori*; OR, odds ratio; 95% CI, 95% confidence interval.

\*Adjusted for random household effect.

<sup>#</sup>Adjusted for age, sex, ethnicity, household factors and random household effect.

associated with decreased odds. However, due to the lack of statistical precision in this analysis, additional data are needed to more accurately estimate effects of hygienic behaviors on Hp prevalence in Arctic communities such as Aklavik.

## References

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