

# *H. pylori* Gastric Cancer & PUD Pilot Study in Alaska



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# Peptic Ulcer Disease (PUD) Circumpolar Region

- Increased gastric ulcer (GU) to duodenal ulcer (DU) ratio
  - Alaska
    - Yip et al. *JAMA* 1997 48% with gastric ulcers/erosions
    - Thompson et al. *AK Med* 2005 GU:DU ratio of 1:1
    - Sacco et al. *AK Med* 2007 GU:DU ratio of 4:1
    - Bruce et al. In Press GU:DU ratio of 5:1
  - Greenland
    - Ingeman-Neilsen et al. *U Laeger* 1990 GU:DU ratio of 2:1
    - Fenger et al. *Int J Circ Hlth* 1997 GU:DU ratio of 5:1
  - Arctic Norway
    - Eriksen et al. *J Clin Gastro* 1995 GU:DU ratio of 2:1
- Increased # of hospitalizations associated with PUD
  - Alaska
    - Demma et al. *Am J Trop Med* 2008 Incidence rate – 299/100,000
  - N Canada
    - Bernstein et al. *Dig Dis Sci* 1999 Incidence rate – 394/100,000

# Gastric Adenocarcinoma

## Circumpolar Region

- Alaska Lanier et al. *AK Med* 2006
  - Gastric cancer rates in ANs are 3-4 times higher than rates among Caucasians in the rest of the US
- N Canada NWT Report 2003
  - Higher rates in Northwest Territories (NWT) than lower Canada
- Greenland Friberg et al. *Int J Cancer* 2003
  - Gastric cancer rates are 2-3 times higher than rates in the rest of Denmark
- Sweden Hassler et al. *Eur J Epi* 2001
  - The Saami of N Sweden had double the risk of developing gastric cancer compared to Swedes in general

# Gastric Adenocarcinoma in Alaska Native and Greenlandic People

Annual Age-Adjusted Incidence Rates per 100,000 pop

## Alaska Native 1996-2000

Overall	22.3
Males	27.7
Females	17.7

## Greenlandic 1988-1997

15.0
22.1
9.2

## US Caucasians, 1996-2000

Overall	5.8
Males	8.3
Females	3.8

## Denmark 1988-1997

6.0
7.4
4.7

# ***Helicobacter pylori*: host and bacterial virulence factors for severe clinical outcome**

- Hypothesis-generating pilot project
- Funded through the NIH's Native American Research Centers for Health grant cycle VI
- Collaboration
  - Arctic Investigations Program (AIP)/CDC
  - Alaska Native Tribal Health Consortium
  - New York University School of Medicine
    - Provide laboratory training
    - Provide technical guidance
- Increase AIP/CDC laboratory capacity
- Data generated to be used for future case/control study

# Objectives

## Primary

- To determine the frequency of putative pathogenic factors in *H. pylori* recovered from Alaska Native persons with gastric cancer or PUD and to compare with the frequency of the same putative pathogenic factors in *H. pylori* recovered from persons without gastric cancer or PUD. Cases & controls
- To determine the frequency of host pro-inflammatory polymorphisms among Alaska Native persons with gastric cancer or PUD. Cases only

## Secondary

- To determine the frequency of environmental co-factors, such as diet, smoking, alcohol use, obesity, family medical history, NSAID use, concomitant medical conditions, and occupation among Alaska Native persons with gastric cancer or PUD.

# Accomplishments/Goals

- Accomplishment
  - Grant application approved for funding
  - IRB and privacy board approved protocol
  - Submitted protocol for Tribal review
  - Met with collaborators at NYU to begin technology transfer
- Goals
  - 1 year
    - Begin participant recruitment
    - Begin testing control organisms
  - Year 2-3 (2011-2013)
    - Continue participant recruitment
    - Continue technology transfer to AIP/CDC
    - Continue all laboratory testing
  - 4 year
    - Complete participant recruitment
    - Complete laboratory testing
    - Complete data analysis and begin report writing
    - Share findings with partners

# Future Studies – Gastric Cancer

- Prospective case-control study
  - Determine risk factors such as dietary history, family history etc.
  - Determine if there are particular bacterial genotypes associated with gastric cancer
  - Determine if there are particular host factors associated with gastric cancer



Thank you

