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Improving
Indoor Air
Quality in
Alaska Native
and other
Indigenous
Communities
in North
America

Healthy Communities and Ecosystems



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Tribal Environmental Health

- In parts of Alaska, 1 in 4 infants are hospitalized each year for respiratory infection
- Adequate emergency care is often inaccessible, due to remote locations, lack of roads and poor weather conditions
- Project aims to reducing the need for emergency respiratory care by improving home environments



Alaska Native Tribal Health Consortium

- Largest tribally-owned health organization in the US
- Center of the Alaskan Tribal Health System
- ANTHC provides comprehensive healthcare and public health services for over 220 Tribes in Alaska
- Division of Environmental Health and Engineering
- Alaska Native Medical Center



Problems and Solutions

Health:

- Pulmonologist at the Alaska Native Medical Center saw the alarmingly high numbers of respiratory patients from southwest Alaska
- Critical care needed, and provided

Environmental Health:

- But what about the underlying causes?
- Could environmental triggers be identified and addressed?
- Could health outcomes be improved through prevention of exposures?

Rural Alaska Housing



- Houses are small - $\sim 1000 \text{ ft}^2$
- Crowded – 4.7 occupants per home (YK Delta)
- Poorly ventilated
- In poor condition and not designed for cold climate
- Lack basic services- 1 in 3 lack in-house water and flush toilets

Environmental Triggers

- Environmental triggers to respiratory infections include wood and tobacco smoke, dust mites, mold, pests, and combustion by-products
- Studies show that identification and reduction of triggers may decrease respiratory infections in children
- Study: Association between woodstove use and respiratory hospitalizations in southwest Alaska
- Study: Woodstove replacement in Nez Perce Tribe (Idaho) resulted in a 52% reduction in PM_{2.5} (Boulafentes)
- Study: Installing ventilators reduced respiratory symptoms in Inuit children (Kovesi)

Our Approach

- Identify children aged 1-12 yrs with frequent respiratory hospitalizations
- Assess the home environment to determine potential of interventions to improve indoor air quality
- Select 15 homes for intervention by improved ventilation, woodstove changeout, mold remediation, education & outreach
- Pre- and post air sampling and respiratory health questionnaires will assess effectiveness

Project Partners

ANTHC

Yukon Kuskokwim Health Corporation

Bristol Bay Area Health Corporation

Association of Village Council Presidents

Bristol Bay Housing Authority

Alaska Housing and Urban Development

US Centers for Disease Control and Prevention

US Environmental Protection Agency

Children's Hospital of Eastern Ontario

Recap: Project Objectives

- Measure air quality in tribal homes
- Implement home-based interventions to reduce air pollutant levels
- Measure impact of interventions for decreasing incidence and severity of respiratory symptoms in Alaskan Native children
- Share methods and results with North American partners



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Three countries. One environment.