



Contact: Joaqlin Estus
Phone: (907) 729-1914
Cell: (907) 980-1885

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Groundbreaking study links respiratory disease with inadequate water service

*Respiratory problems cause about 75 percent of all hospitalizations
for Alaska Native and American Indian children*

A study of modern water services and hospitalization yielded surprising results: A lack of running water in the home is linked to severe respiratory infections among Alaska Natives. These findings are a first, to the authors' knowledge. Health professionals have thought the benefits of clean water were primarily gastro-intestinal. This study shows that lung and skin infections among Alaska Native persons are also associated with inadequate water service.

“For decades, there hasn’t been enough money from federal and state sources to address the problem of clean water and sanitation,” said Alaska Native Tribal Health Consortium Chairman and President Don Kashevaroff. “It’s time to build the systems needed throughout rural Alaska.”

“The study highlights the need for sanitation infrastructure in rural Alaska, where about one third of the homes lack modern sanitation facilities,” said Alaska Native Tribal Health Consortium Chief Executive Officer Paul Sherry. “It confirms that flush toilets and piped water lead to improved health status.”

The study’s findings are important because of the seriousness and rates of respiratory illness among Alaska Native infants and children. About 75 percent of all hospitalizations for Alaska Native and American Indian children are due to respiratory problems. The findings may have international significance as well because acute respiratory infections are the second leading cause of child deaths worldwide where many communities lack adequate sanitation facilities.

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The prestigious *American Journal of Public Health* (AJPH) is featuring an article about the study in its April issue. Publication in AJPH highlights the significance of the findings, and shows that peers have determined the study meets rigorous scientific standards. The article was the product of a two-year collaboration between the CDC Arctic Investigations Program (CDC-AIP), the

Alaska Native Tribal Health Consortium (ANTHC), and the Indian Health Service. Dr. Tom Hennessy, CDC-AIP Director, and Troy Ritter, ANTHC Environmental Health Consultant, originated the study.

They investigated whether availability of in-home water and flush toilets is associated with lower hospitalizations for sanitation-related disease. Investigators compared levels of in-home water service to hospitalization rates for acute respiratory infections, skin infections, and diarrheal disease. They looked at areas with no, low, or limited in-home water service, and compared them to communities with higher rates of modern water service.

The study's findings are that lower water services lead to:

- Significantly higher hospitalization rates for pneumonia and influenza, skin infection and Respiratory Syncytial Virus
- Significantly higher hospitalization rates — up to one third of infants hospitalized annually for pneumonia and RSV
- Higher rates of outpatient skin infections and hospitalizations

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Attachments: *“The relationship between in-home water service and the risk of infections of the lung, skin, and gastrointestinal tract among Alaska Native persons,” due to be published in the May 2008 issue of the American Journal of Public Health*

Biographical information about co-authors Dr. Tom Hennessy and Troy Ritter

Thomas Hennessy, MD, MPH

Thomas Hennessy is the Director of a one-of-a-kind field station of the Centers for Disease Control and Prevention (CDC). The Arctic Investigations Program (AIP) is the only CDC field station that focuses on the health needs of American Indians and Alaska Natives. Moreover, it is the only one dedicated to infectious diseases in the Arctic.

AIP has laboratory, medical/nursing and statistical capacity, allowing conduct of research studies with limited support from outside sources. A combination of 33 federal and tribal (ANTHC) health employees staff AIP. They work toward a common goal of reducing infectious disease threats in the Arctic. CDC formed AIP in 1973.

AIP works closely with Alaska Native tribal health organizations to reduce infectious that occur more commonly among Alaska Natives compared to other populations. That relationship has led to many successes. A few notable ones are the control of hepatitis A and B infections in persons of all ages and reduction in meningitis among infants and children.

Dr. Hennessy has worked for CDC since 1994. He specializes in the epidemiology of infectious disease, or the study of the causes, distribution, and control of diseases in populations.

Hennessy's past work includes detection and control of the largest salmonella outbreak in US history. He was involved in detecting the first recognized outbreak of Hanta virus pulmonary syndrome. He has worked to detect and control food borne infections, and to prevent infectious diseases among American Indians and Alaska Natives through vaccinations.

Hennessy holds a medical degree from the Mayo Medical School; a Master's in Public Health from Emory University and has completed residency training in Family Medicine and Preventive Medicine. He has been a Commissioned Officer in the US Public Health Service since 1990 and has lived in Alaska since 1998.

Troy Ritter, Senior Environmental Health Consultant for the Alaska Native Tribal Health Consortium, Division of Environmental Health and Engineering

At the Alaska Native Tribal Health Consortium, Troy Ritter provides advanced environmental health training and technical assistance for Alaska's Native health organizations. Ritter has been recognized with several awards and honors:

- 2005 Sabbatical Exchange Ambassador Award, National Environmental Health Association
- 2006 Environmental Health Specialist of the Year, Indian Health Service (national)
- 2006 Employee of the Year, Alaska Native Tribal Health Consortium
- 2006 Outstanding Alumni, Eastern Kentucky University Department of Health Sciences
- Past President, Alaska Environmental Health Association
- Diplomat, American Academy of Sanitarians
- Frequent speaker at state and national conferences on topics concerning water and environmental public health issues
- Provided expert testimony for Alaska legislature and subcommittees on water and public health topics
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Ritter's professional interests include hygiene promotion, understanding water use practices, environmental public health effects of climate change, and operation and management of small water systems. He previously served as Chief Environmental Health Officer for the Yukon Kuskokwim Health Corporation in Bethel, Alaska. Ritter holds the rank of lieutenant commander in the US Public Health Service. He has lived and worked in Alaska since 1999.

Ritter has a Masters in Public Health in Public Health Practice, from University of Massachusetts. He is pursuing a PhD in Environmental Public Health at University of Alaska Fairbanks.