

Community experiences and perspectives on water and sanitation and ways to move forward



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Overview

1. Current research findings from unserved communities
2. Your experiences
3. Technologies and opportunities
4. Your innovations



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Questions to think about

What are your impressions of the information being shared?

What are your biggest health and wellbeing concerns related to water and sanitation ***without*** piped water and flush toilets?

What concerns to do you have about health and wellbeing in communities where there ***is*** piped water and flush toilets?



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Questions to think about

What did you learn that is new or surprising about the information presented on the slides?

What have we missed in the conversation so far that you would like to teach us or learn more about?

What do you want to communicate to professionals outside of your communities about water, sanitation and health?



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Water is Life



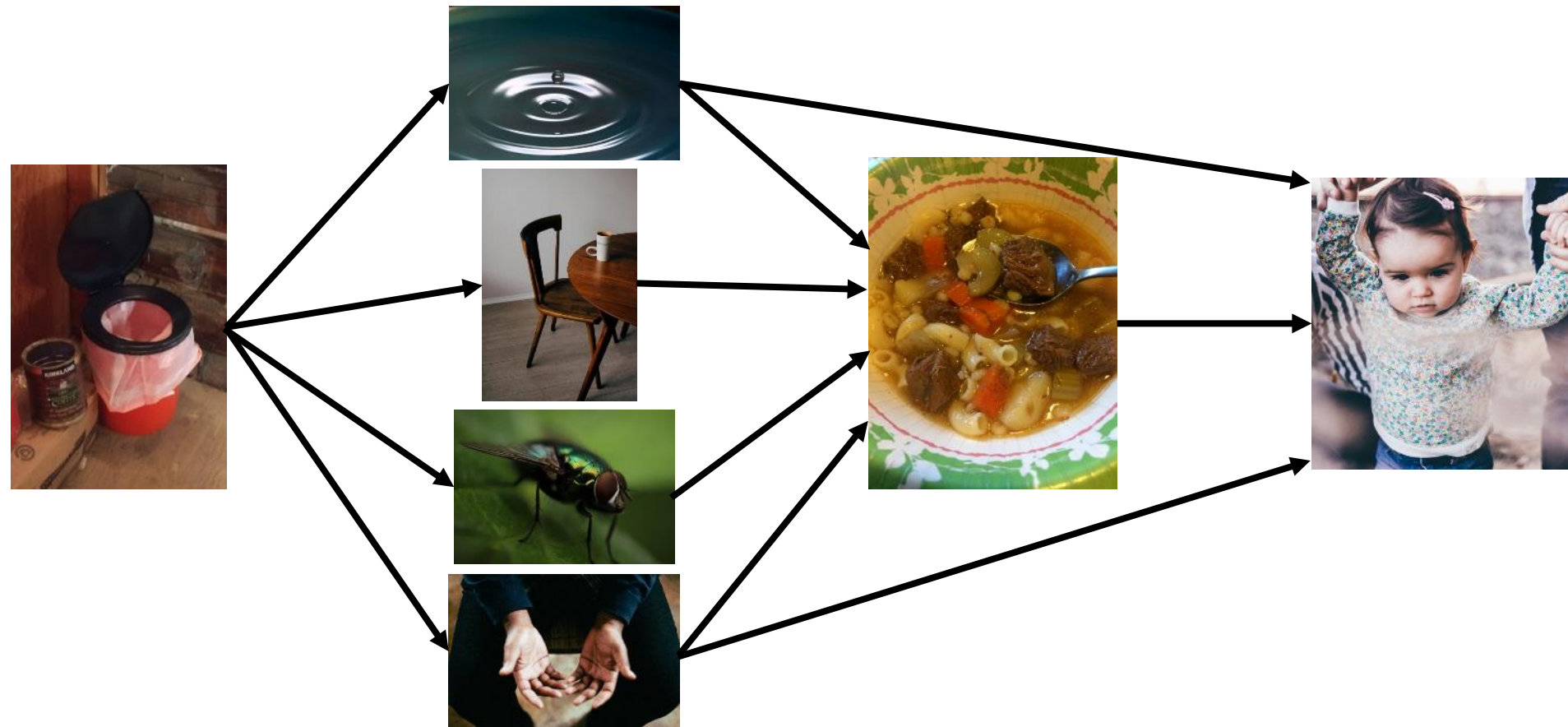
Apayu Moore – Kwethluk “Water Is Life” project



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Spreading germs

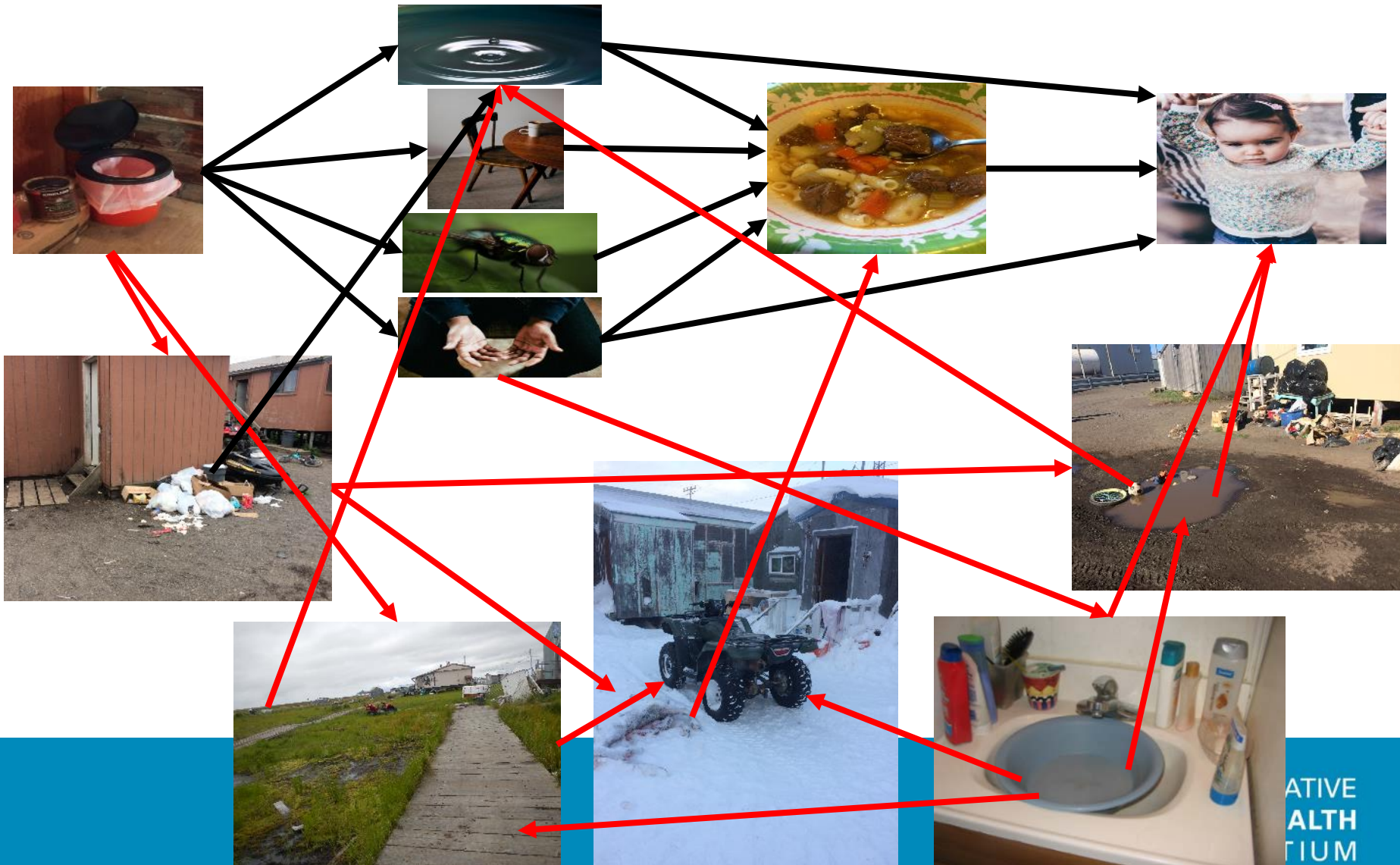


Reducing waterborne illness



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Water washed illness



Water quantity often depends on ease of getting water to the home



= 5 gallons
per person
per day

Unserved villages
1.5 g/c/d



Average US Household
80-100 g/c/d



Piped villages
25 g/c/d



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Rate per 1,000 persons

Skin infection rates

compared with rate of water service in village of residence,
all ages, YK Region, 1999-2000

Staphylococcus
aureus

Methicillin-resistant
Staphylococcus
aureus

Hospitalized

Less than 10%

10-79%

Greater than or equal to 80%

Bethel

*P is less than 0.001 for trend

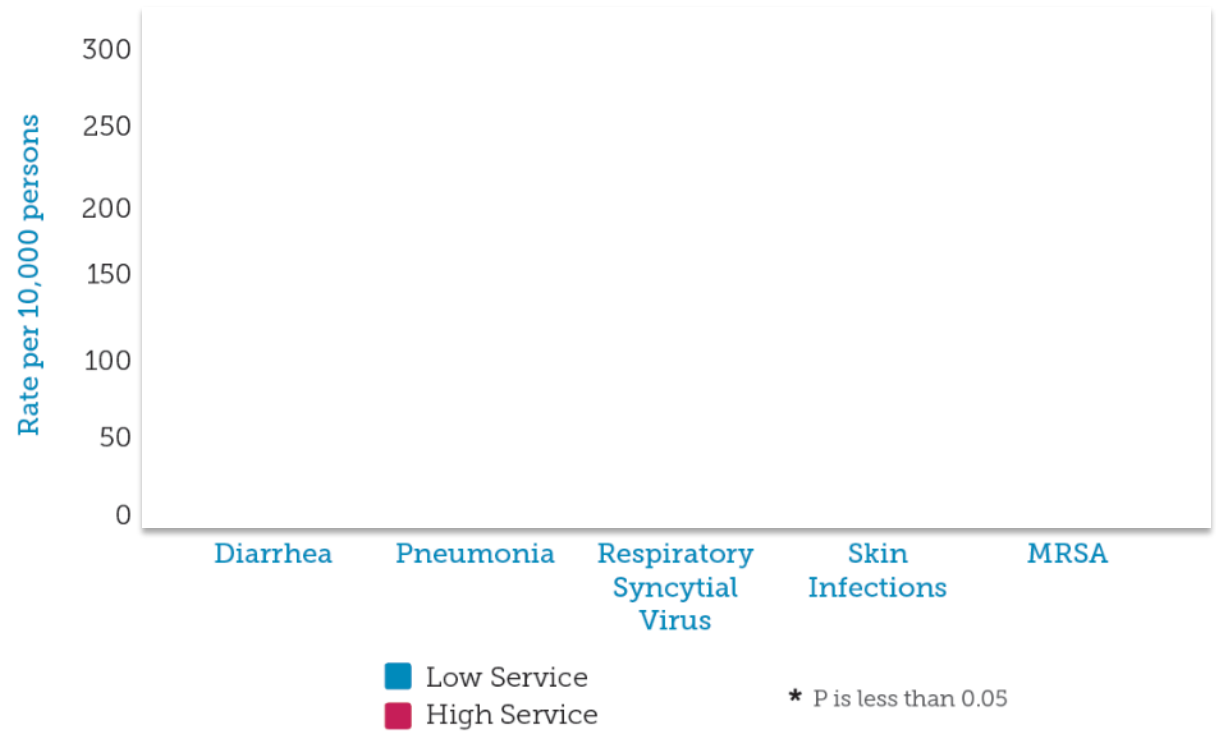
This study was a partnership between the Centers for Disease Control Arctic Investigations Program and Alaska Native Tribal Health Consortium Environmental Health Support program.



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Hospitalization rates for "High" and "Low" Water Service Regions, Alaska, 2000-2004



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Four village study

Water use increasing from **1.5 to 25** gal/person/day leads to decline in illnesses:

- 16% decrease in respiratory
- 20% decrease in skin
- 38% decrease in gastrointestinal





Other water concerns



CHEMICAL
CONTAMINANTS



EMERGING
CONTAMINANTS



TREATED AND
UNTREATED SOURCES



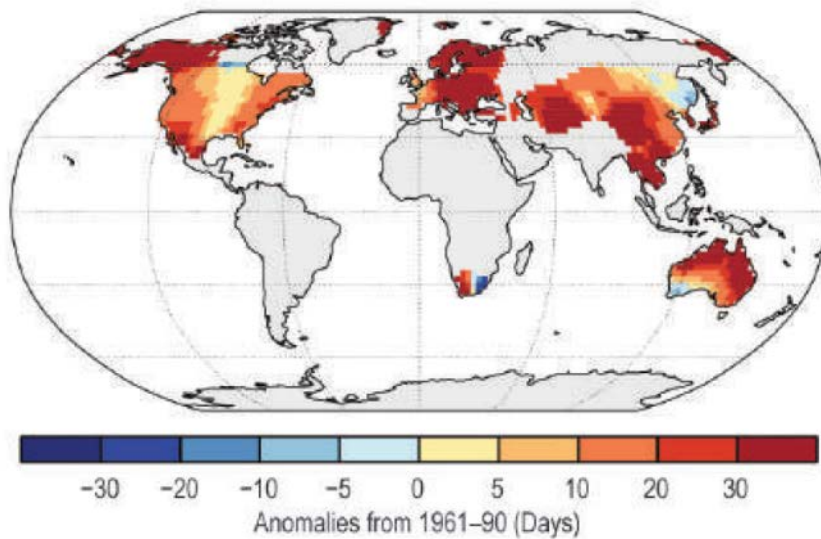
WASTE AND WASH
WATER DISPOSAL



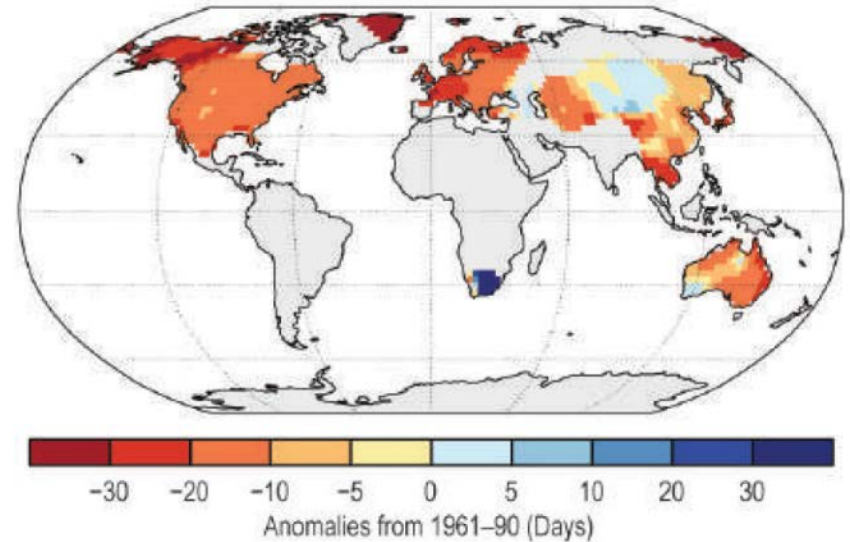
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Climate change impacts

(c) Warm Days



(d) Cool Days



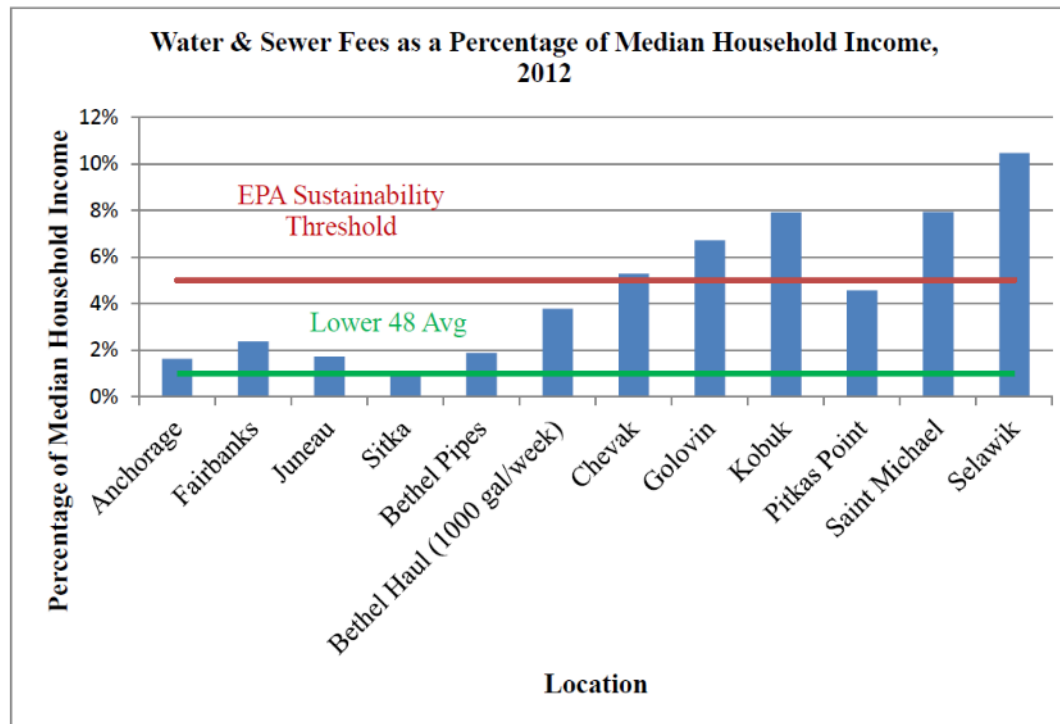
Blunden, Jessica, Derek S. Arndt, Ahira Sánchez-Lugo, Ted A. Scambos, Carl J. Schreck III, Sharon Stammerjohn, Kate M. Willett, Howard J. Diamond, Robert JH Dunn, and Nadine Gobron. "State of the Climate in 2016." *Bull. Amer. Meteor. Soc* 98, no. 8 (2017): S93-S128.



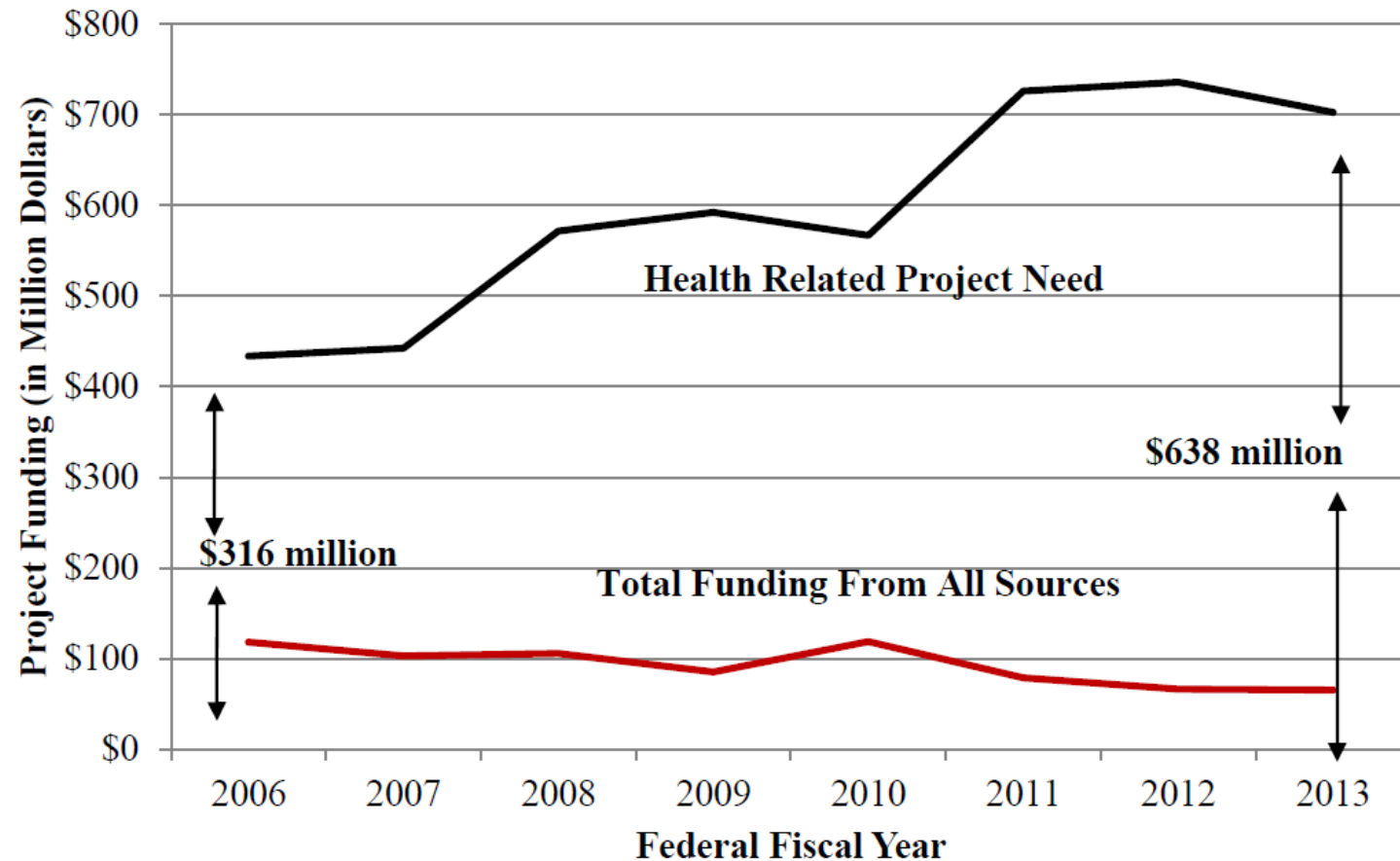
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Challenges with piped systems

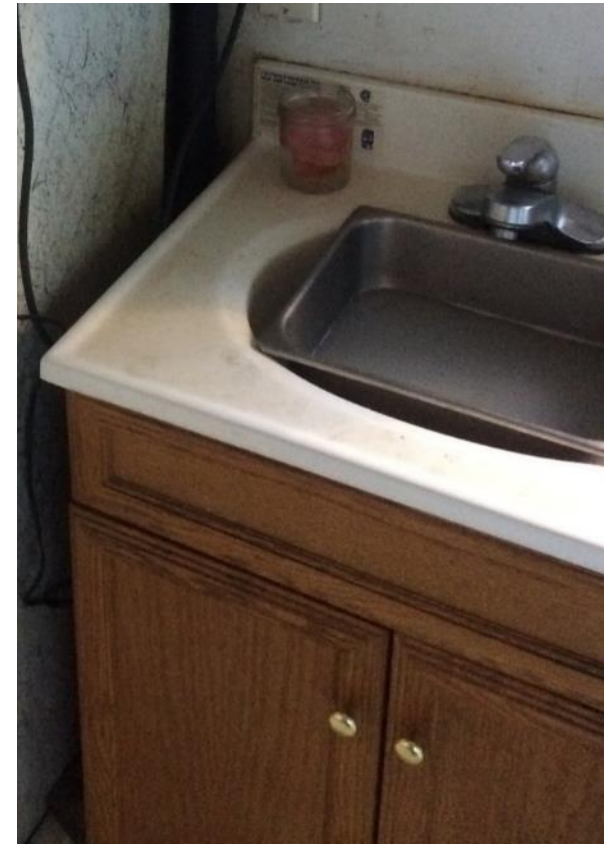
- High capital costs
- Design innovations
- Seasonal changes
- Freeze/thaw prevention
- Trained operators
- Bill payment



Funding gaps



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Operation, maintenance and human behavior

The End Goal for Agencies

- Clean water for drinking
 - Enough water used for washing and cleaning
 - Enough safe storage for water
 - Treatment before reuse
 - Safe disposal of used water
 - Safe disposal of toilet waste
- ...paid for, operated and maintained forever!

What do you think?



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What are your biggest **health and wellbeing concerns...**

...related to water and sanitation without piped water and flush toilets?

...in communities where there IS piped water and flush toilets?



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What did you learn that is new
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What have we missed in the conversation so far that you would like to teach us or learn more about?



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What do you want to
communicate to professionals
outside of your communities
about water, sanitation and
health?



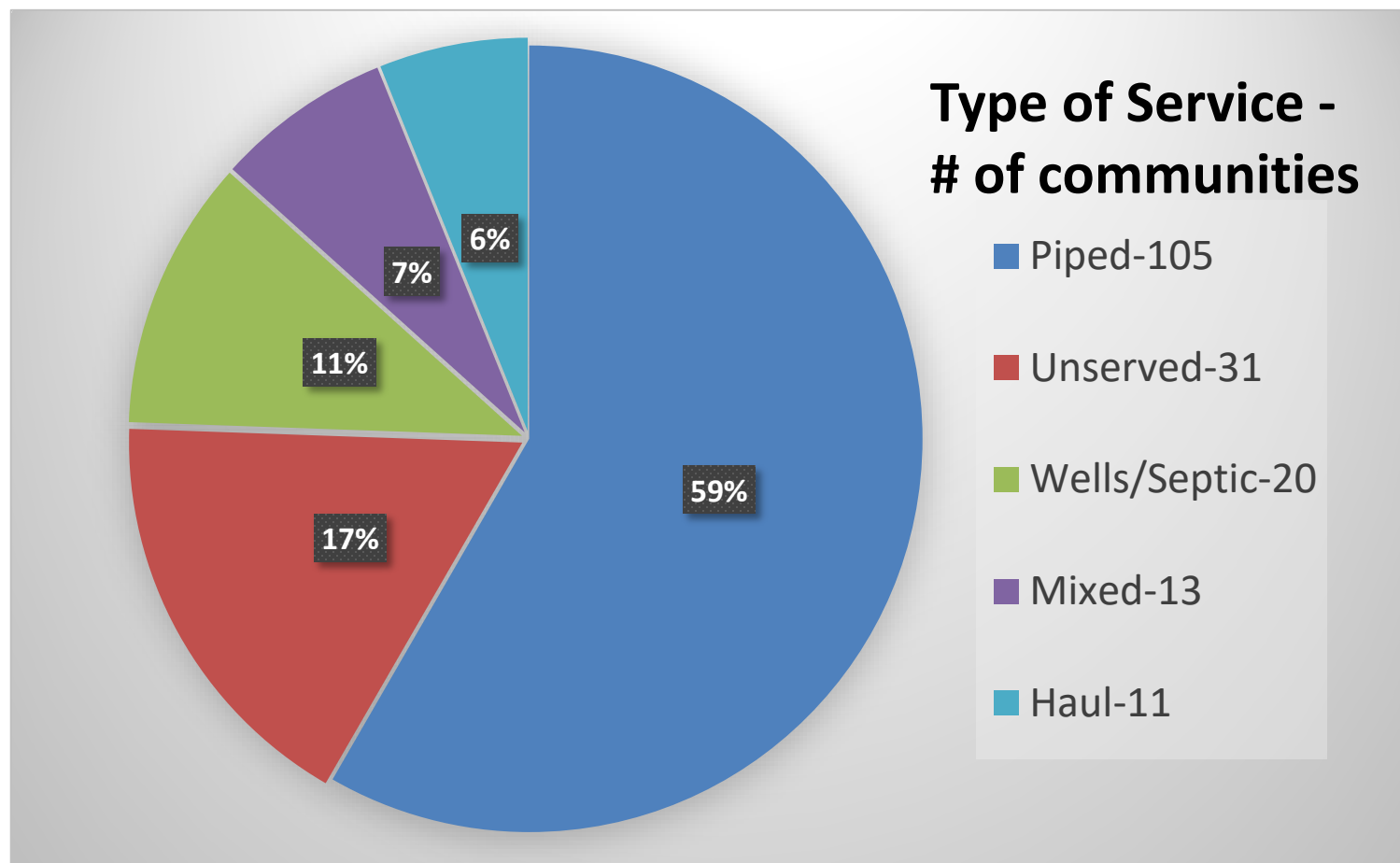
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What else would you like to talk about?



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Service levels in rural Alaska



Sanitation ladder in rural Alaska

Pipes



Flush-Tank-Haul



PASS unit



Outhouse



Honey Bucket



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Portable Alternative Sanitation System

Water treatment unit
and storage tank



Low-flow gravity-fed
sink and drainage



Separating toilet w/
ventilation



Community infrastructure



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Community strategies and innovations

Questions

What do you think about the different infrastructure? Particularly, what do you think about the non-pipe options that are out there for your community?



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Questions

What else can be done to improve water and sanitation in unserved communities?



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Questions

Are there ideas or innovations that you use or have heard of to improve water and sanitation in unpiped communities?



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What else would you like to talk about?



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Quyana! Taikuu!

Thank you!



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