



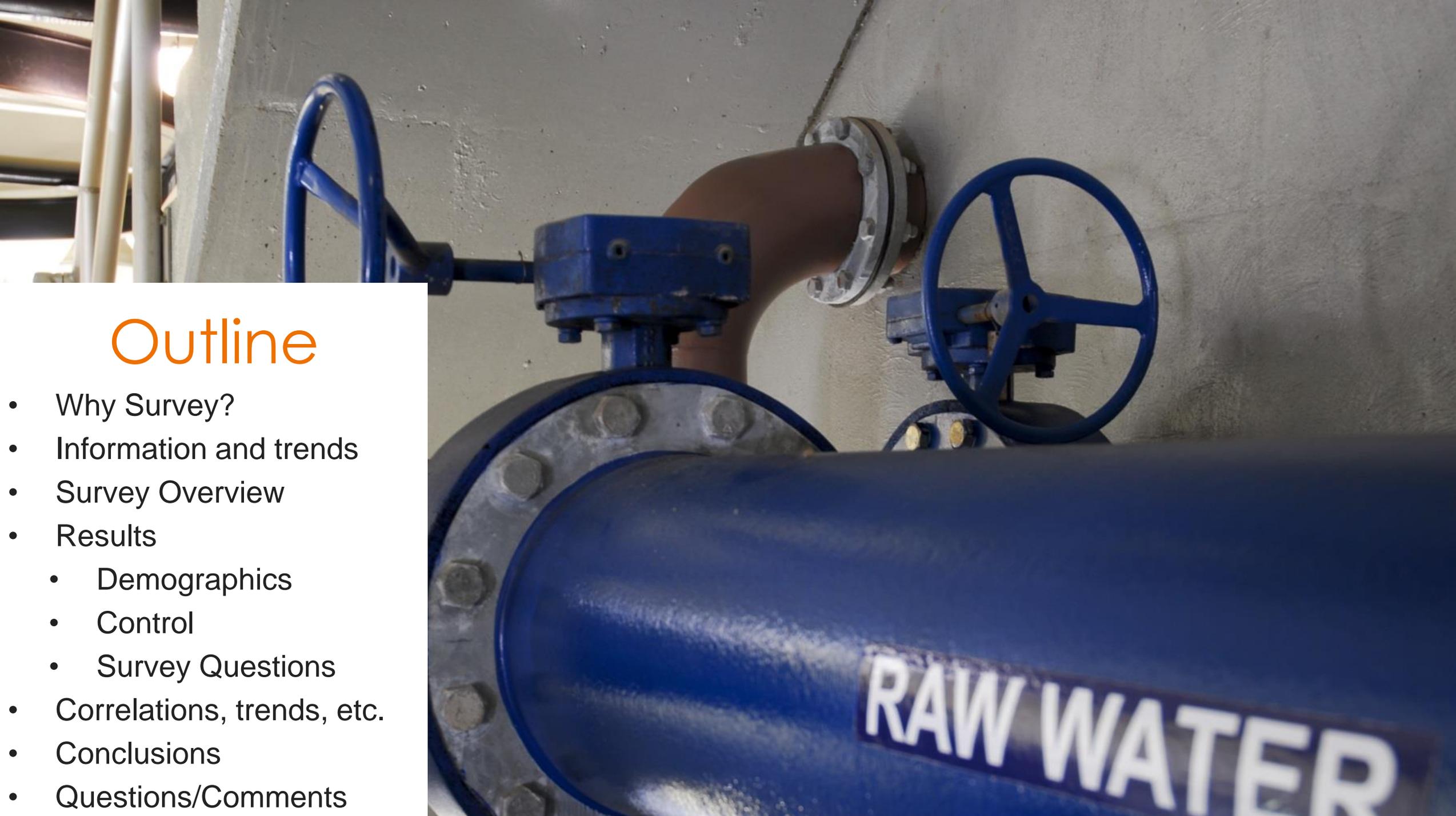
PNWS-AWWA Section Conference
Vancouver, WA
May 2, 2019 2:30PM

What Do Your People Really Know?

Summarizing Public Knowledge and
Understanding of Drinking Water Issues
in Today's Information-Rich World



Sean Thomson

A photograph of a blue industrial valve with a large handwheel and a pipe labeled 'RAW WATER'. The valve is mounted on a concrete wall. The pipe is blue and has the words 'RAW WATER' written on it in white capital letters. The valve has a large blue handwheel and a smaller blue handwheel. The pipe is connected to a larger pipe with a flange. The background is a concrete wall.

Outline

- Why Survey?
- Information and trends
- Survey Overview
- Results
 - Demographics
 - Control
 - Survey Questions
- Correlations, trends, etc.
- Conclusions
- Questions/Comments

Flash Survey!

Which of these sound concerning or dangerous?

- 1,3,7-trimethylpurine-2,6-dione
- 4-O- β -D-Galactopyranosyl-D-glucopyranose
- Hexachlorobenzene

Why Survey?

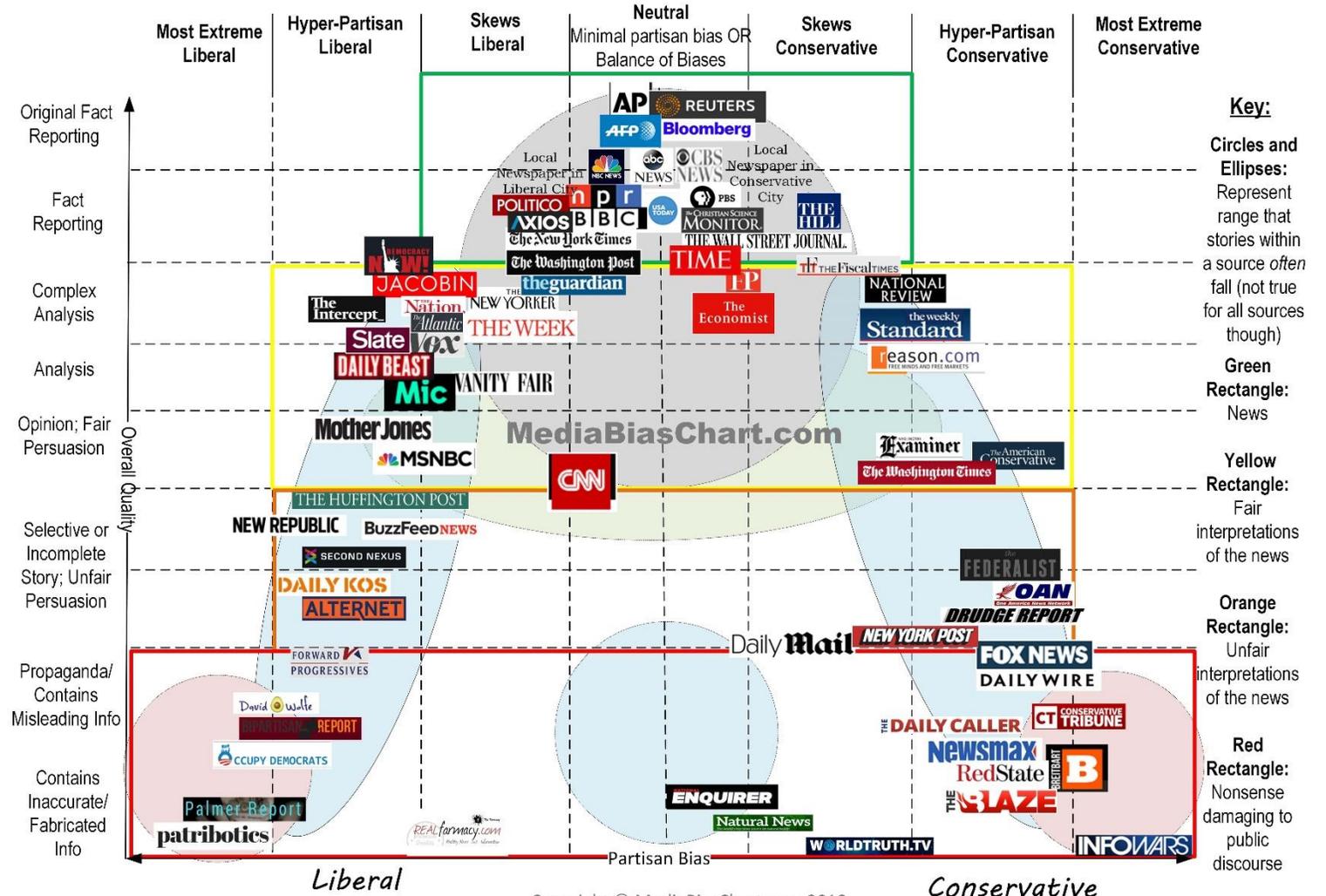
- Are there gaps in public water knowledge?
- Are your capital improvement goals aligned with public needs/wants?
- Are there trends based on demographics?
- Are your citizens happy?
- Are your citizens getting the right information?

An Information-Rich World

- Massive News media Competition
- Political spectrum
- Journalism quality
- Social Media
- Fake News



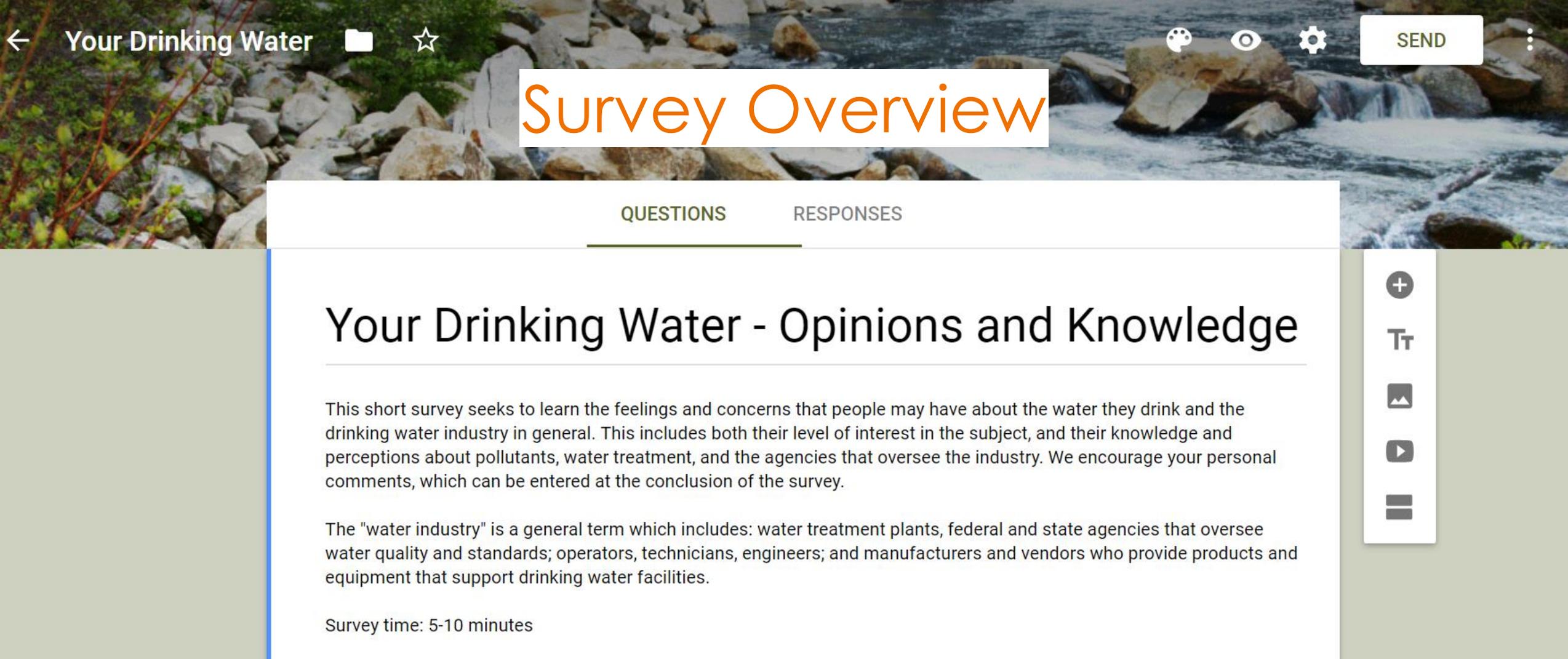
Local Rumors



Key:
 Circles and Ellipses: Represent range that stories within a source often fall (not true for all sources though)
 Green Rectangle: News
 Yellow Rectangle: Fair interpretations of the news
 Orange Rectangle: Unfair interpretations of the news
 Red Rectangle: Nonsense damaging to public discourse

Trends, Hoaxes, Concerns – oh my!

- Alkaline Water
- Dihydrogen monoxide hoax
- Fluoride
- Recycled Water
- Chlorination
- Raw Water
- Contamination
- And more...



Survey Overview

QUESTIONS

RESPONSES

Your Drinking Water - Opinions and Knowledge

This short survey seeks to learn the feelings and concerns that people may have about the water they drink and the drinking water industry in general. This includes both their level of interest in the subject, and their knowledge and perceptions about pollutants, water treatment, and the agencies that oversee the industry. We encourage your personal comments, which can be entered at the conclusion of the survey.

The "water industry" is a general term which includes: water treatment plants, federal and state agencies that oversee water quality and standards; operators, technicians, engineers; and manufacturers and vendors who provide products and equipment that support drinking water facilities.

Survey time: 5-10 minutes

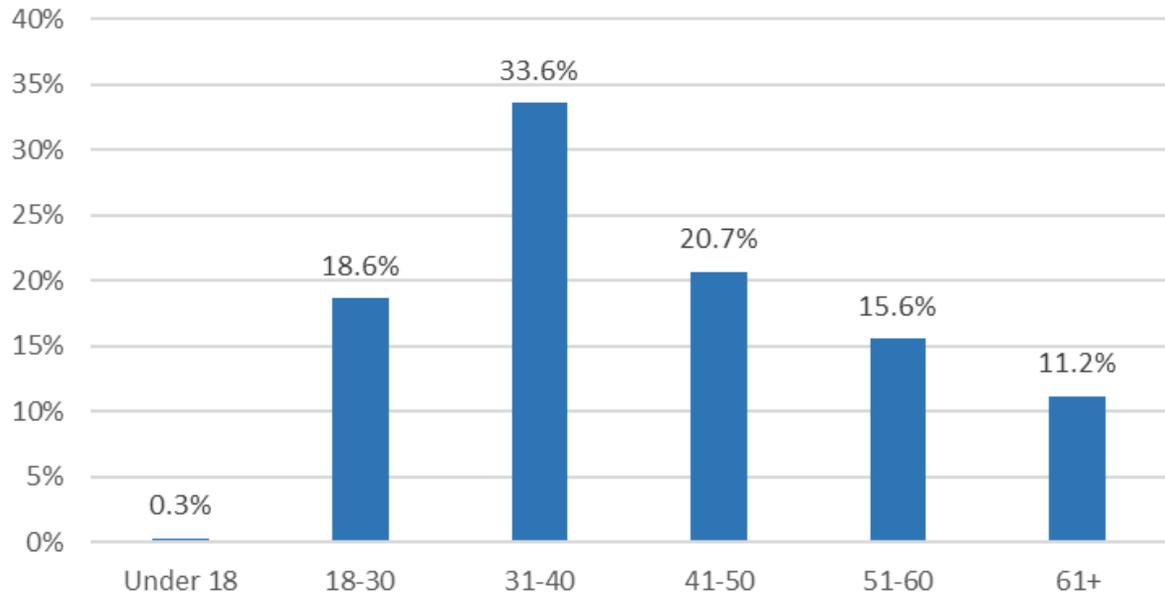
- Google Forms survey -19 Questions
- 295 Responses from February to April 2019
- Sent via social media (Facebook, LinkedIn, Yammer) and email

Survey Overview

- Demographics
- Control questions
- Tap water sources and treatment
- WTP Tours
- Chemicals and substances in water
- Water Rates
- Recycled Water
- Correlations & Trends
- Conclusions

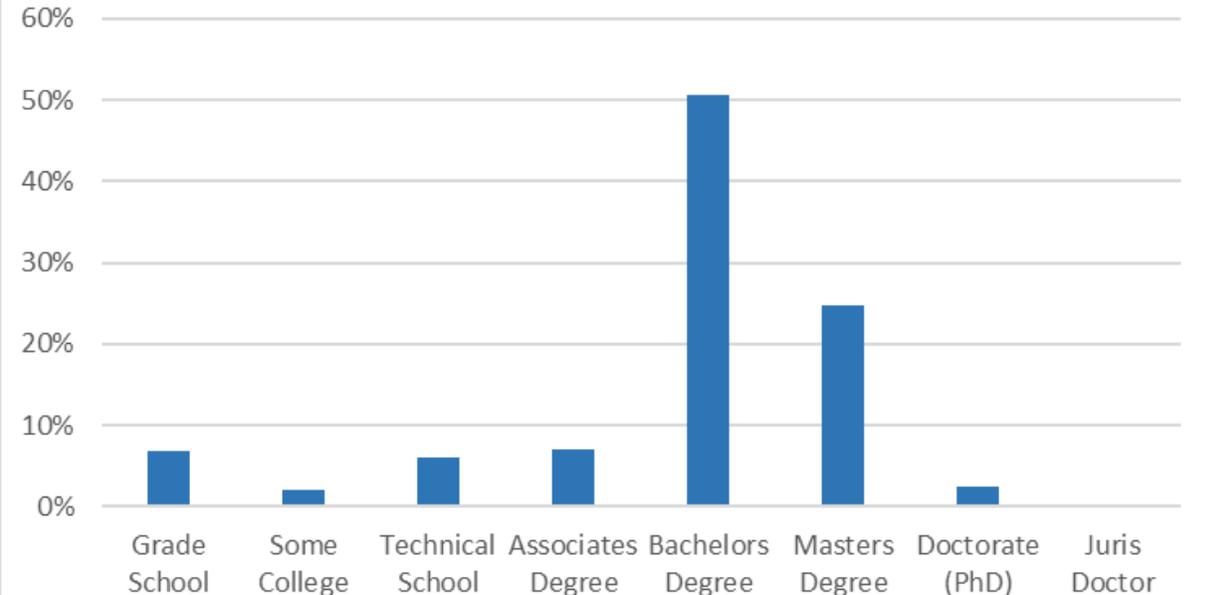
Demographics

Participant Age Distribution



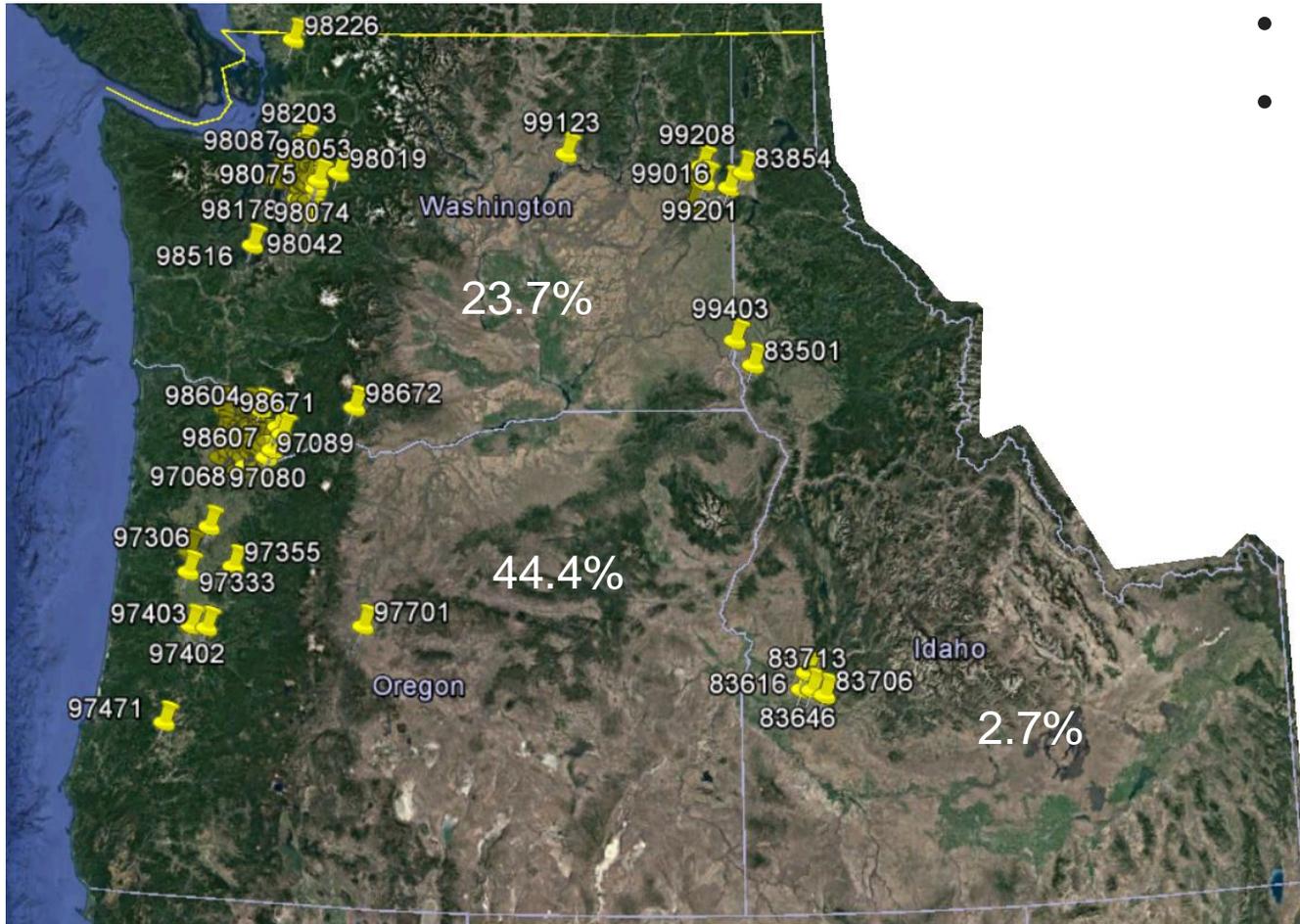
1 person under 18 included with 18-30 age group

Participant Education Distribution

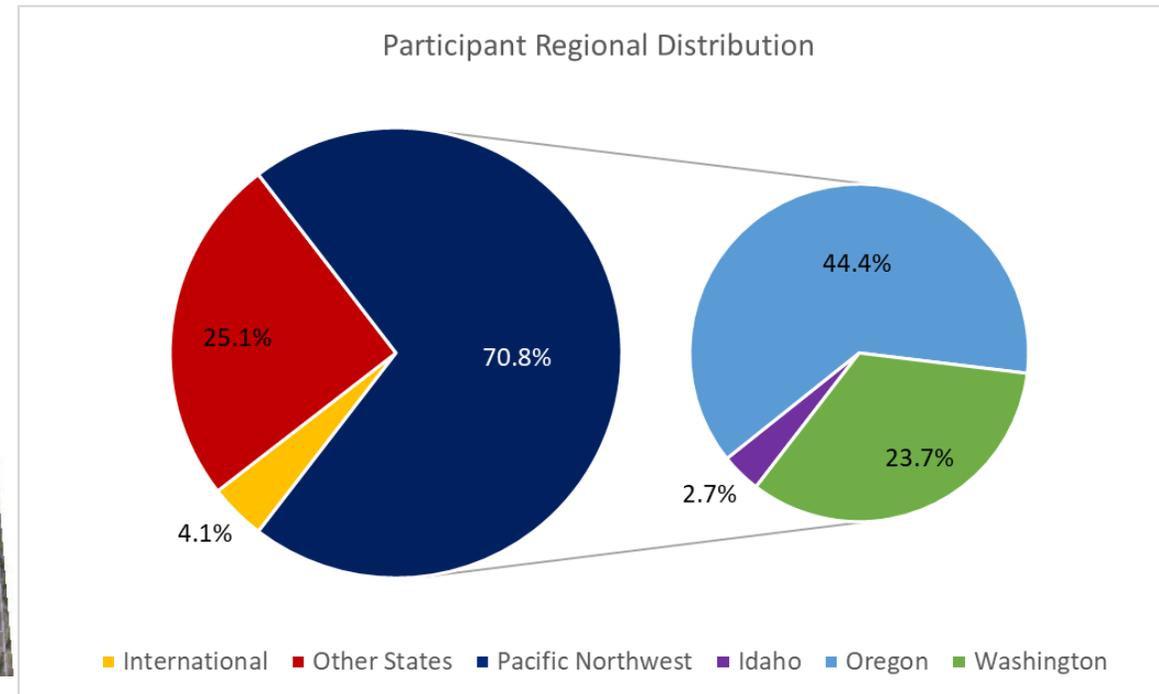


1 Juris Doctor included with Doctorate (PhD) group

Participant Location



- Majority PNW zip codes
- Mostly urban population



State of the Water Industry (SOTWI) Control Questions

1. In your opinion, what is the current overall state of the water industry?
2. Looking forward, how sound will the overall water industry be five years from now?

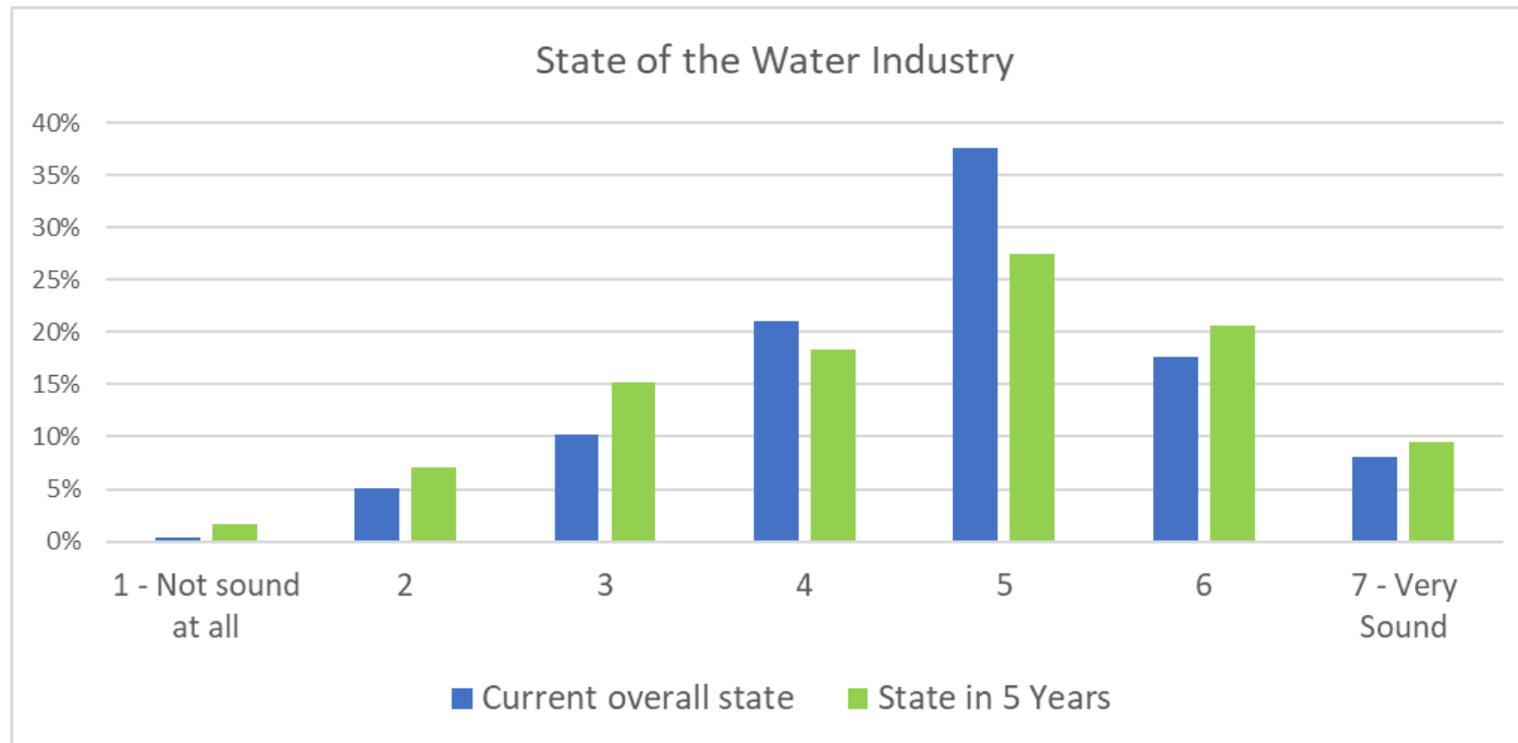
Scale of 1 through 7

1 – Not sound at all

7 – Very sound

State of the Water Industry (SOTWI) Control Questions

Participant opinion of the “state” of the water industry is similar and slightly higher than AWWA’s State of the Water Industry (SOTWI) Survey 2018



Averages

| | Current State | State in 5 Years |
|-------------|---------------|------------------|
| This Survey | 4.76 | 4.63 |
| SOTWI 2018 | 4.47 | 4.43 |

Tap Water

- 90% get their tap water from their city, district or private water company
- 6% provide their own water (mostly wells)
- 4% don't know

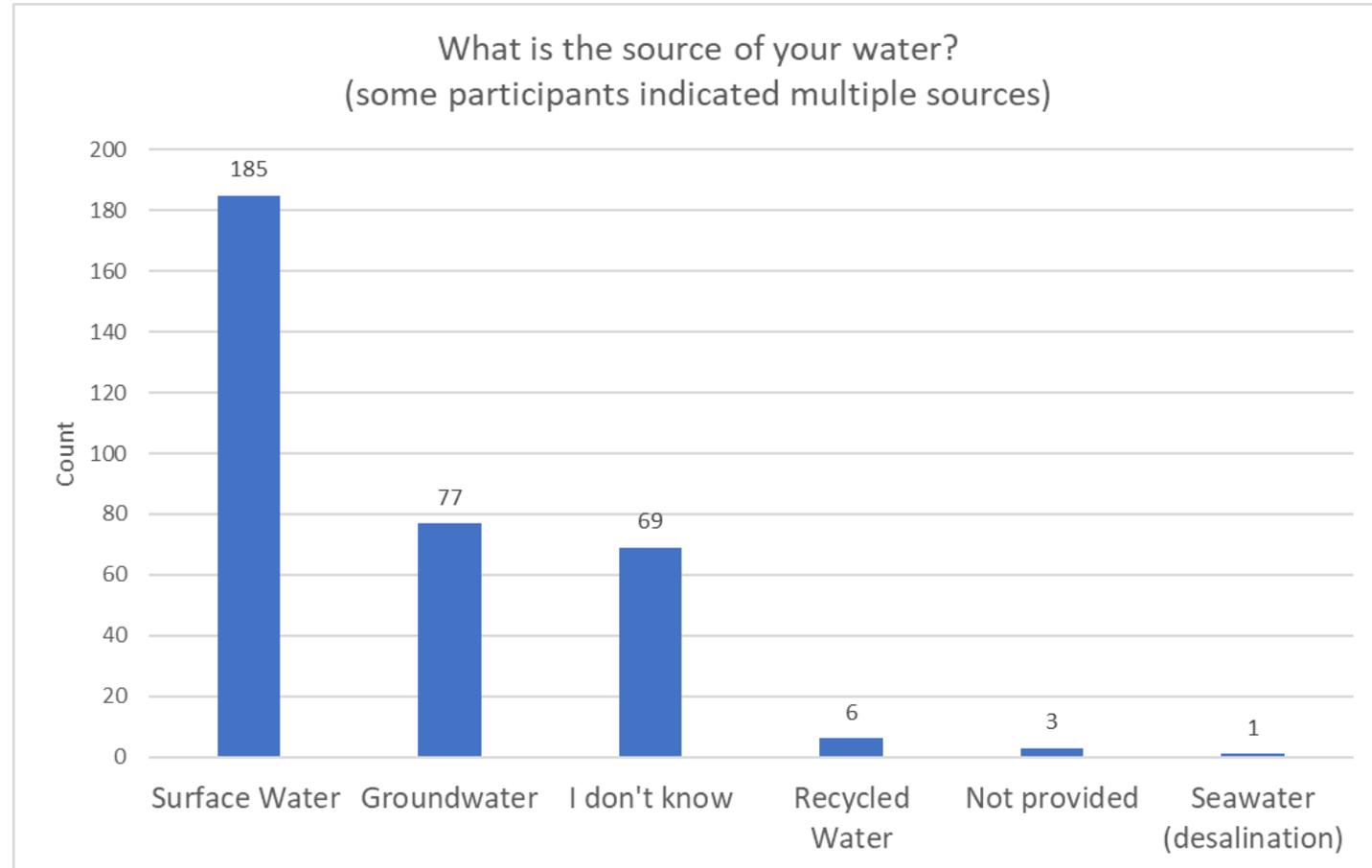
- 33% of participants drink their water as is out of the tap, with no additional treatment

- Many others use Brita[®]-type, on-sink filters, refrigerator filters, etc.
- Some use more advanced home treatment (RO, UV, microfiltration, etc.)

Water Source

Physical source of participants water supply

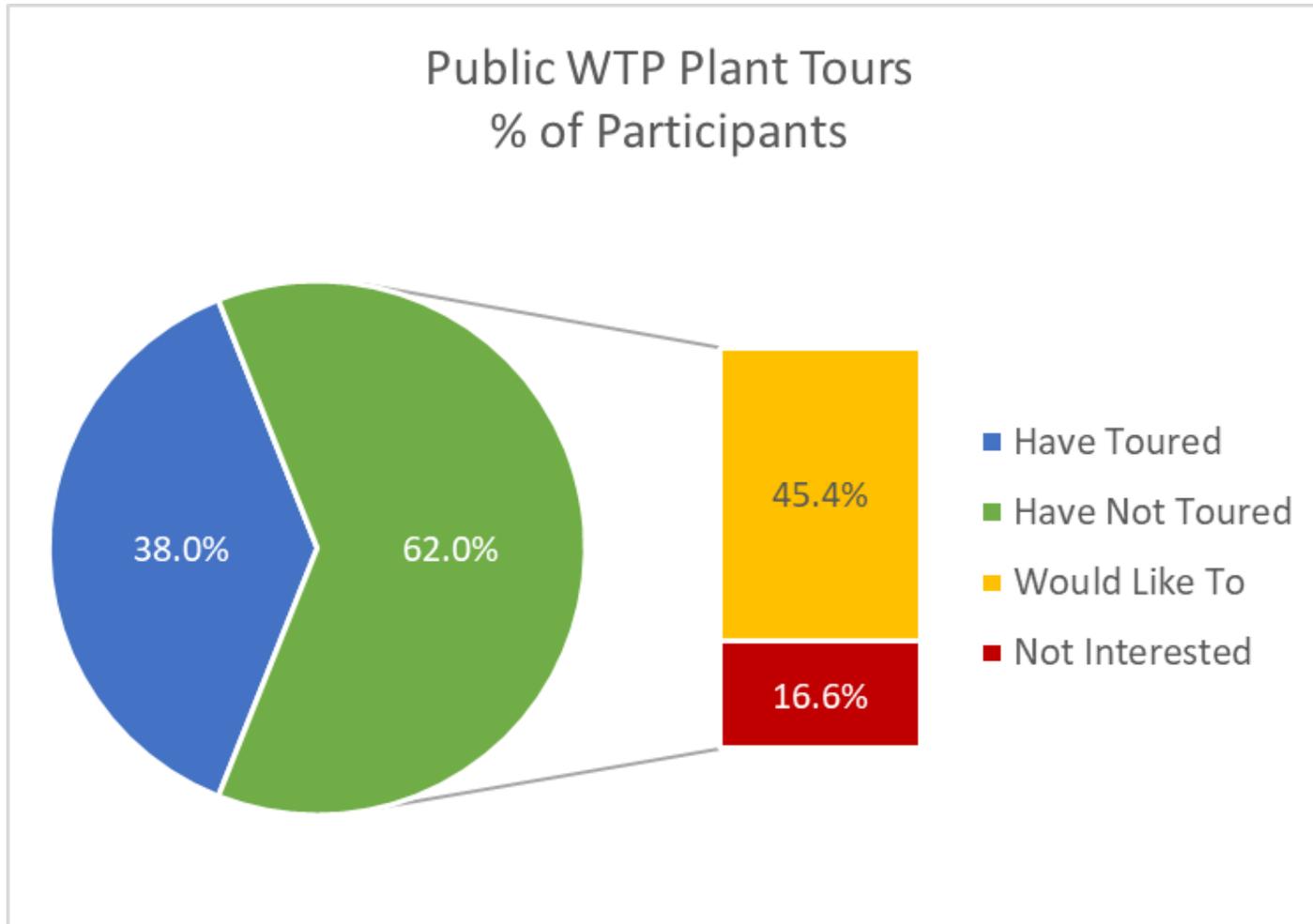
- 29.3% of participants don't know!
- 15.5% from multiple sources
- 4 participants do not drink their tap water at all



Q: Have you ever toured a water treatment plant?

Q: Would you be interested in touring a water treatment plant?

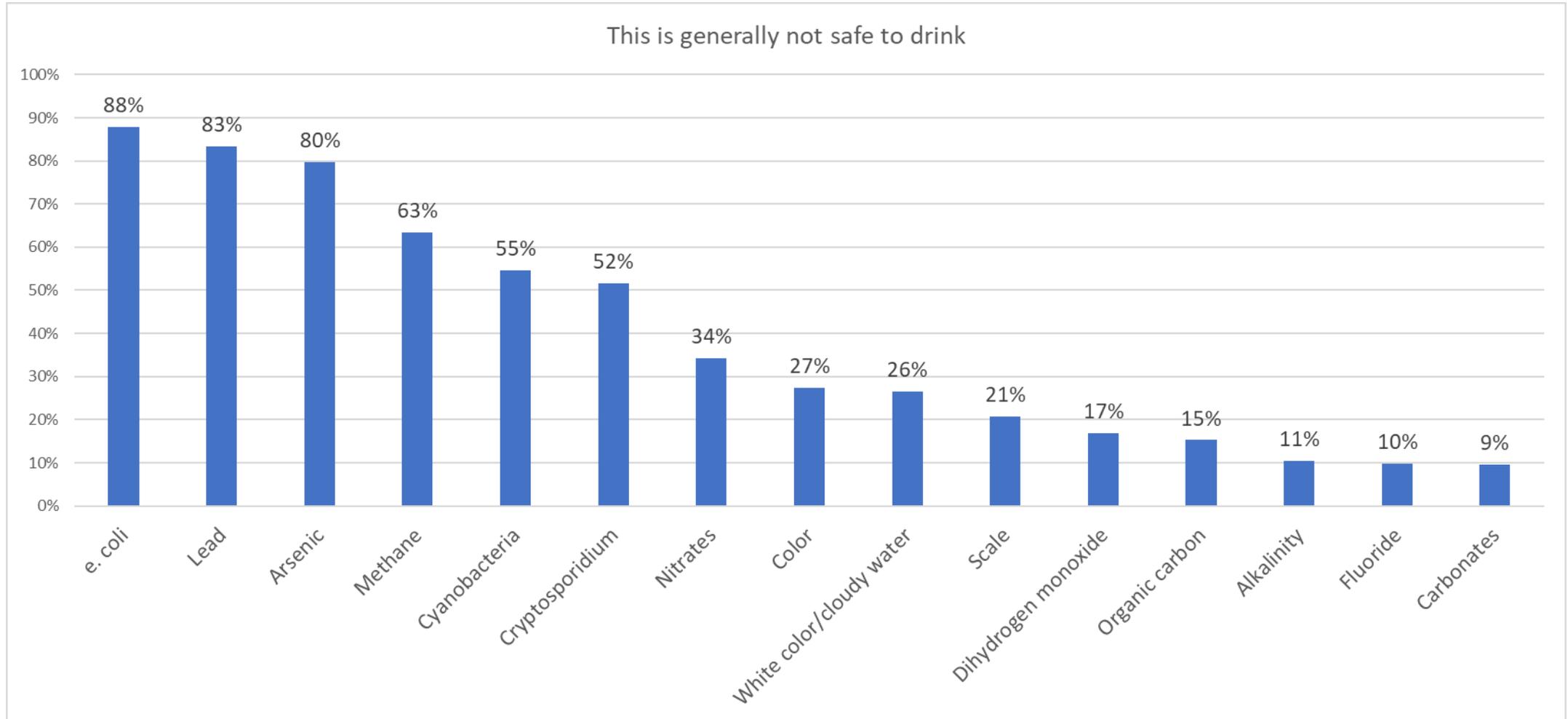
Public Tours of WTPs



- Less than half of participants have visited a water treatment plant
- Several MILLION people in the PNW alone could be interested in WTP Tours
- Massive outreach potential!

Overall Water Safety

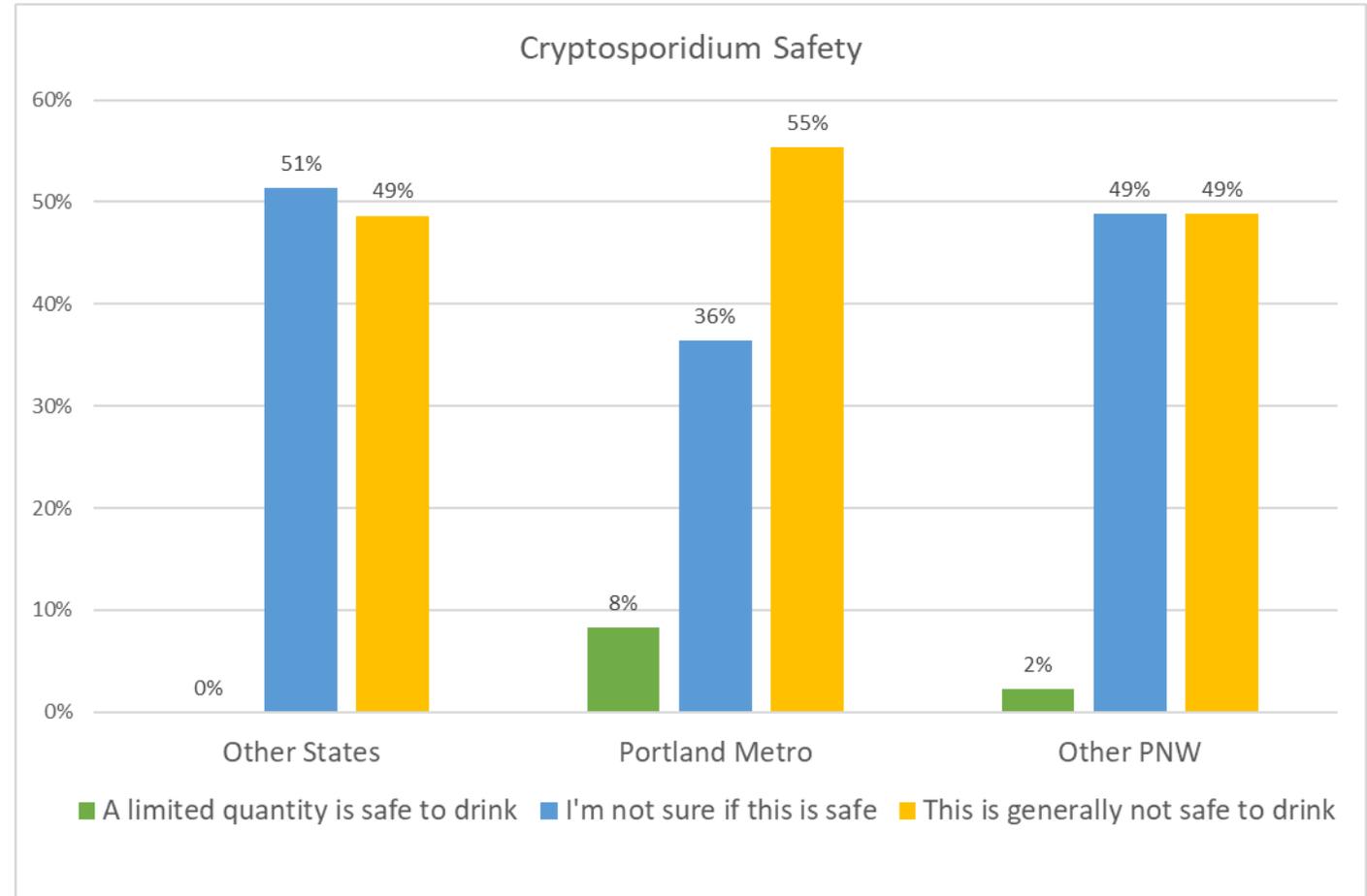
Q: How do you feel about the safety of the following substances in water?



Cryptosporidium Safety

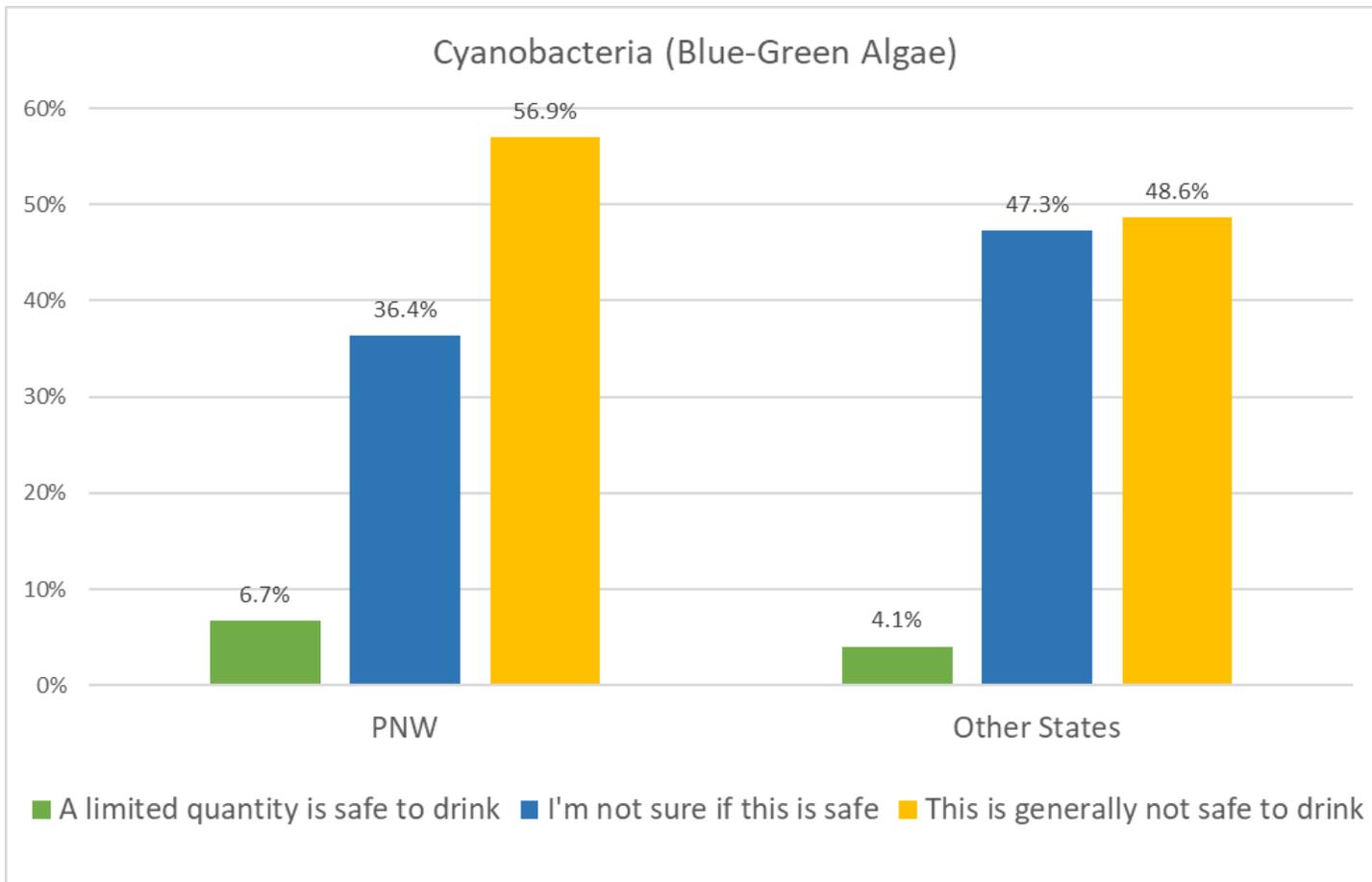
Q: How do you feel about the safety of [cryptosporidium] in water?

- Portland required by EPA to filter water due to cryptosporidium detections
- Likely more awareness in Portland?
- Large portion of participants were not sure



Q: How do you feel about the safety of [cyanobacteria] in water?

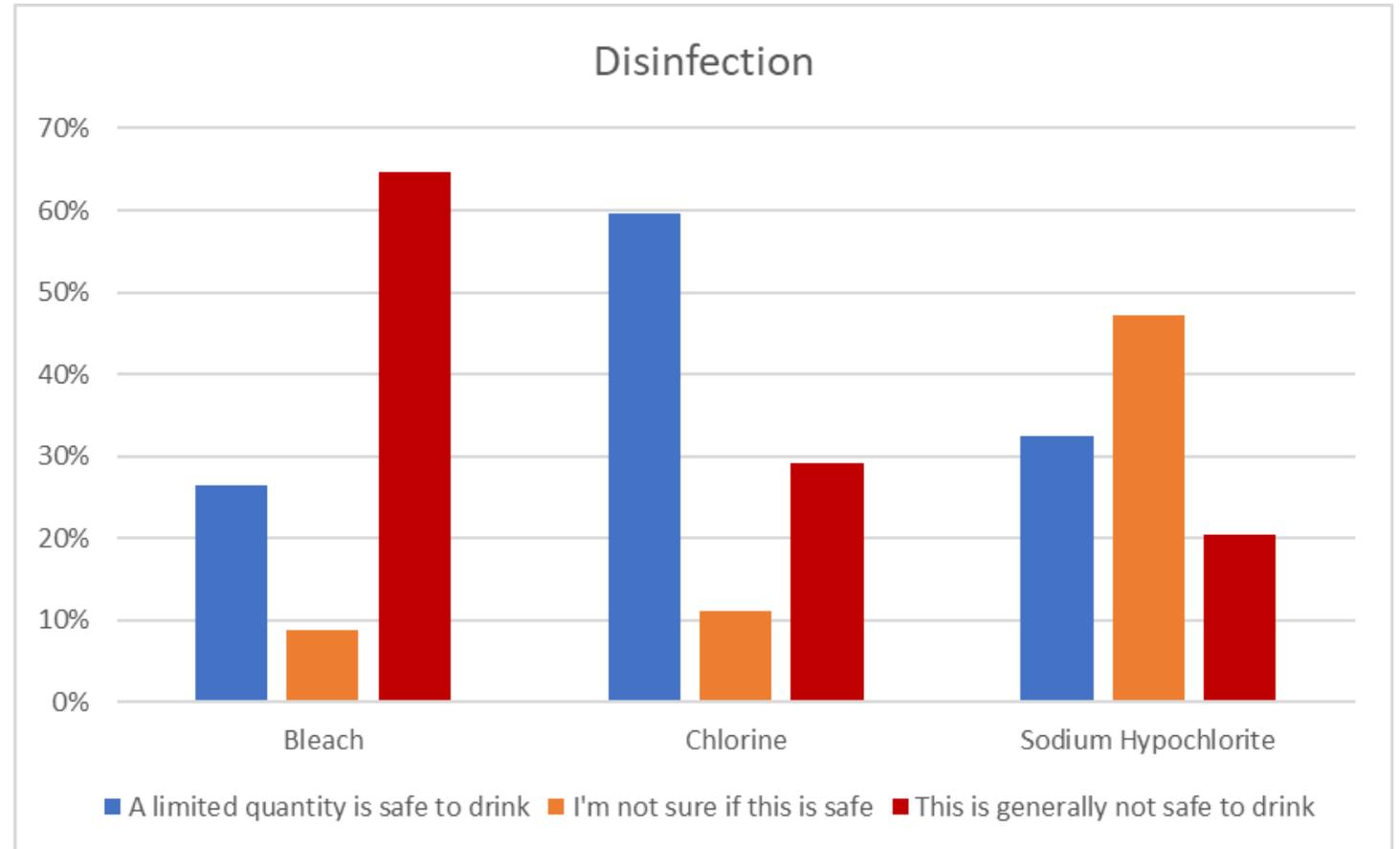
Cyanobacteria (Blue-Green Algae)



- Small number of Salem area participants. Larger pool may have increased awareness percentage due to events in Summer 2018
- “Blue-green algae” was not used in the question

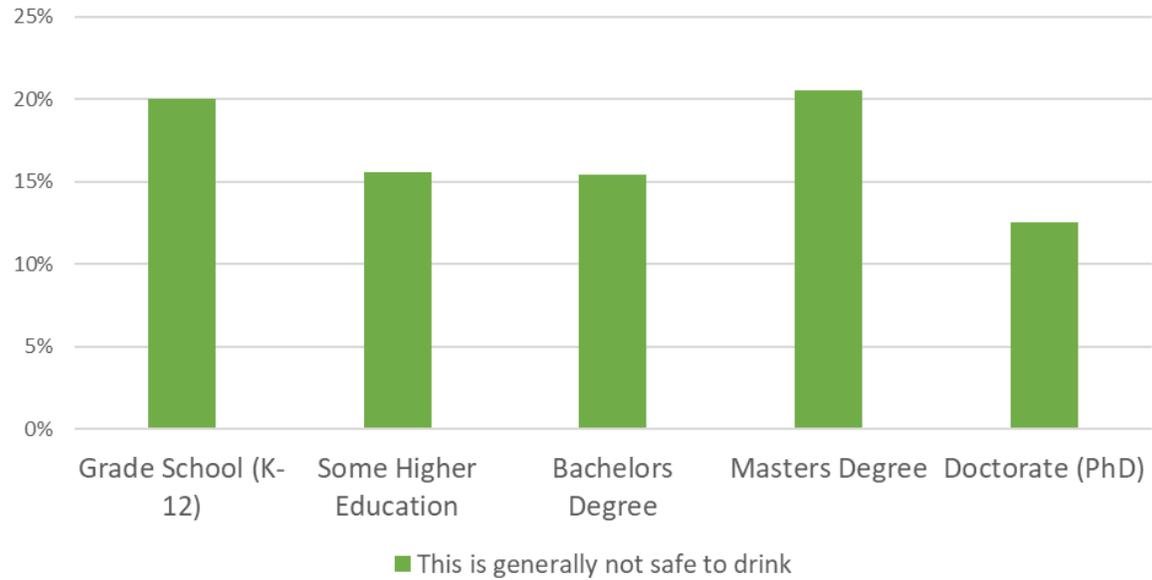
Disinfection – What's in a name?

- Possible misconceptions between bleach, chlorine and sodium hypochlorite
- Sodium hypochlorite is the active ingredient in bleach

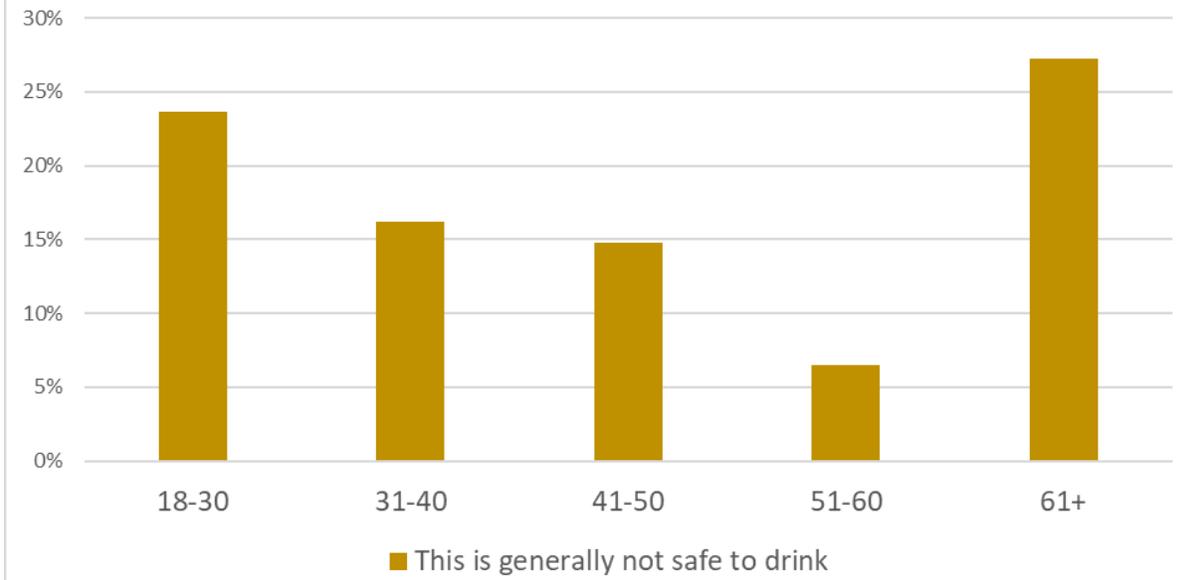


Dihydrogen Monoxide – It's Just Water!

Dihydrogen Monoxide by Education



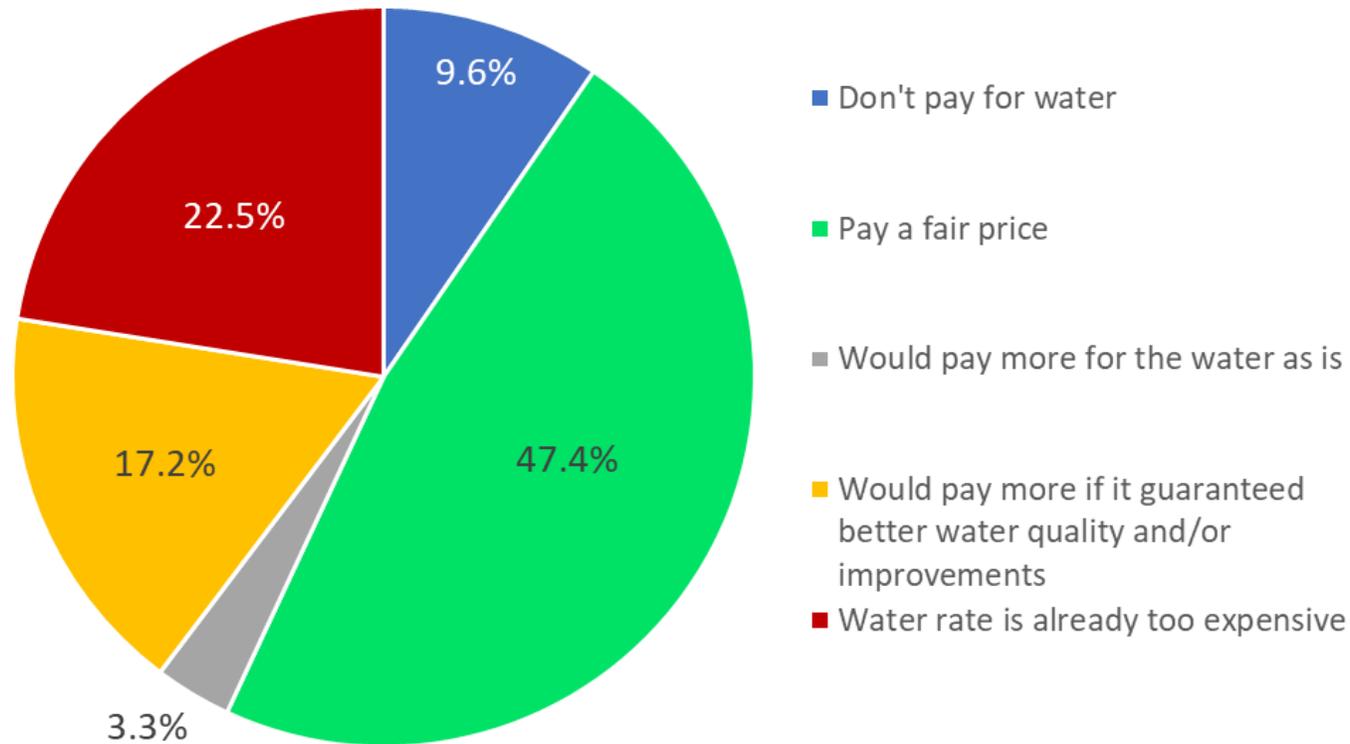
Dihydrogen Monoxide by Age Group



Q: How do you feel about your water rates?

Water Rates PNW

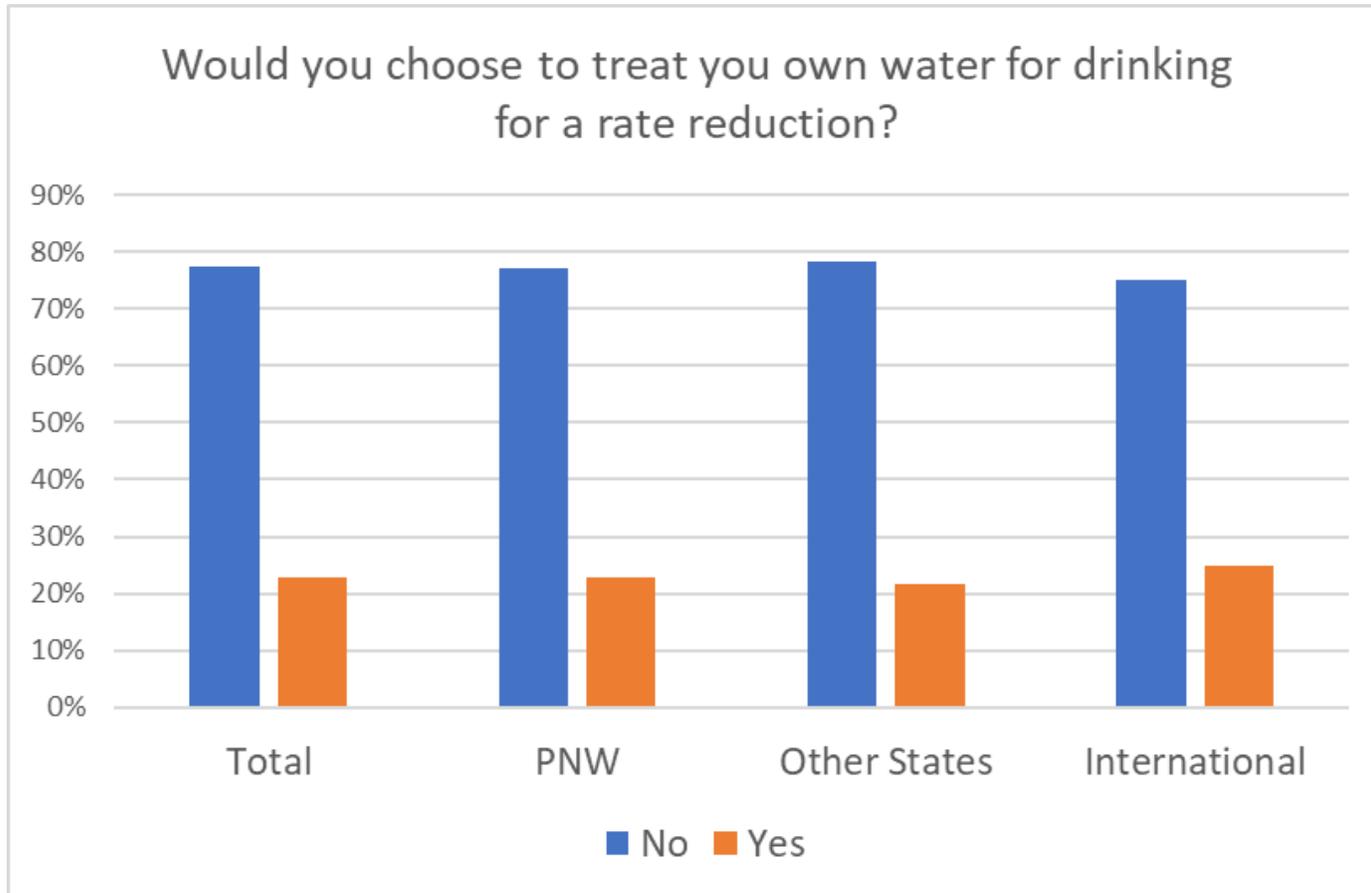
Water Rates in the PNW



- Nearly half report paying a fair price
- 17% would pay more for better quality or improvements

Q: If your water rate could be substantially reduced, would you choose to receive water that was safe for washing and bathing but required YOU to treat if you wanted to drink it?

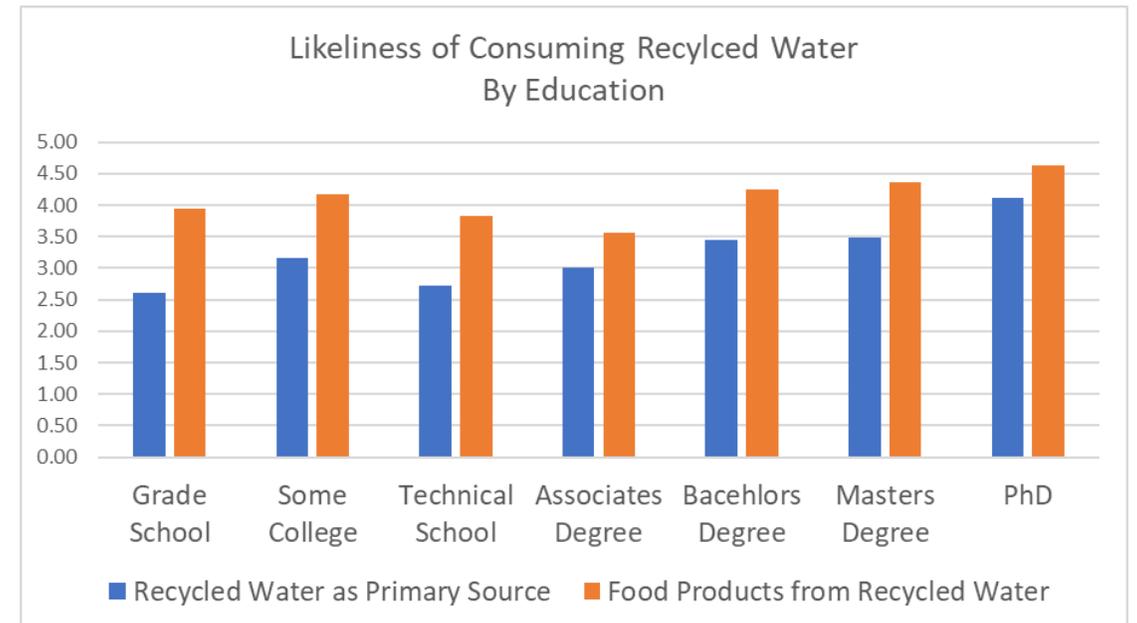
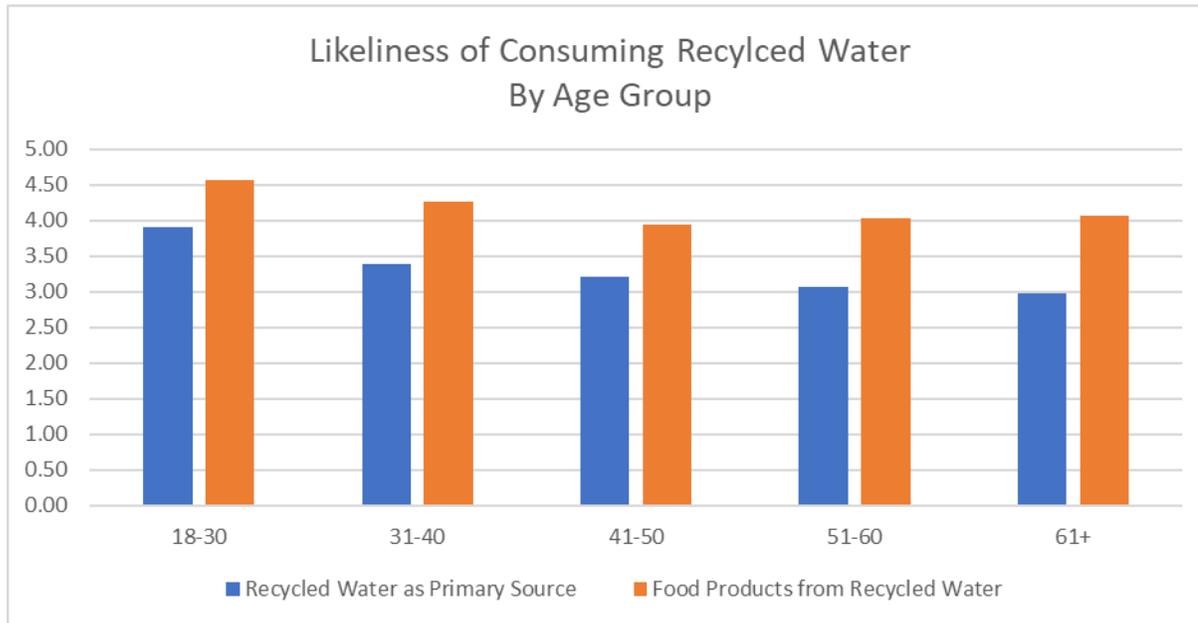
Rate Reduction?



- Nearly 20% of participants in each region would treat their own water for a substantial rate reduction
- 2.0% of participants are already treating their water with advanced treatment (RO, microfiltration, etc.)

Recycled Water

- As primary source?
- Food products grown/produced from recycled water?
- Likelihood decreases with age, increases with education



Flash Survey! RESULTS

Which of these sound concerning or dangerous?

- 1,3,7-trimethylpurine-2,6-dione - **CAFFEINE**
- 4-O- β -D-Galactopyranosyl-D-glucopyranose - **LACTOSE**
- Hexachlorobenzene – **HEXACHLOROGENE (CARCINOGEN)**

Conclusions

- Public confidence on par with those in the water industry
- Majority of consumers drink their tap water, but many choose additional in-home treatment
- Public knowledge of water treatment is still lacking
 - Plant tours
 - Water chemistry naming misconceptions
- Water rates are fair, some would pay more
- Recycled water interest correlates to age and education
- Public outreach has to go to multiple sources

Thank you!

Questions/Comments

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