Today's Presentation

- Results and findings from the WIISE study
- Well water in northern Dakota County
- How to ensure your well water is safe to drink

Wells & Increased Infant Sensitivity and Exposure (WIISE) Study

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Talking points

- Why we did this study
- How we did this study
- Key findings
- Recommendations

Public health issue: **children's vulnerability**

Babies are at greater risk

- Rapidly developing organ systems
- Less able to break down and remove contaminants
- Drink more for their size

Public health issue: **manganese**

Essential nutrient

(we get enough in food)

and

At high levels: a neurotoxin

- Memory
- Attention
- Motor skills
- Learning and behavioral problems

Common in Minnesota groundwater

Public health issue: **manganese** (cont'd)

EPA Guidance

300 µg/L

If above 300 µg/L, infants should not drink water for more than 10 days

Minnesota Guidance

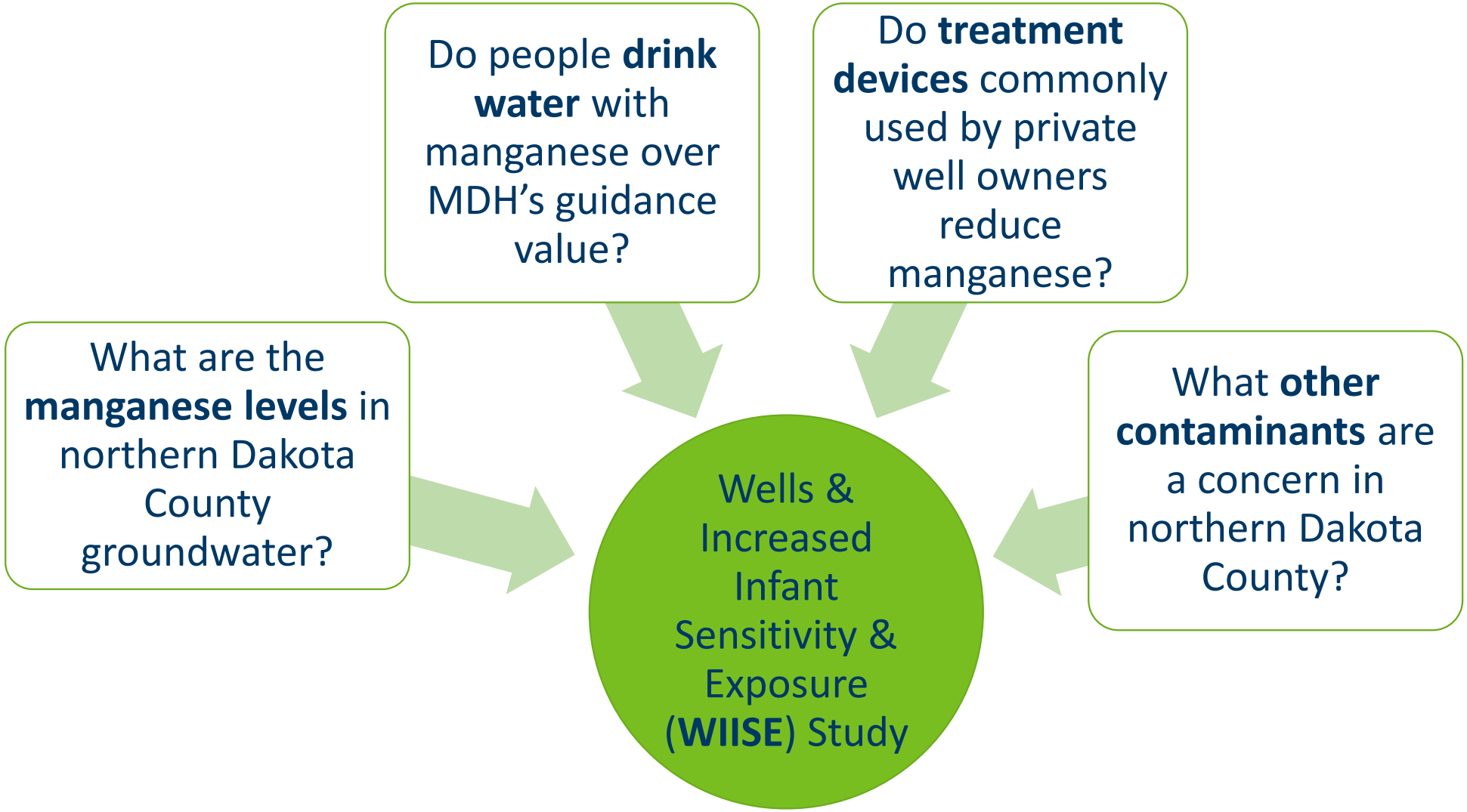
Infants

100 µg/L

Everyone else

300 µg/L

WIISE study


Do people **drink water** with manganese over MDH's guidance value?
Do **treatment devices** commonly used by private well owners reduce manganese?
What are the **manganese levels** in northern Dakota County groundwater?
What **other contaminants** are a concern in northern Dakota County?
Wells & Increased Infant Sensitivity & Exposure (**WIISE**) Study

Study methods

- 800 households invited
- 274 households enrolled
  - **Phase I:** Outdoor spigot sampled & online survey
  - **Phase II:** Indoor spigot sampled if manganese above 100 µg/L in Phase I

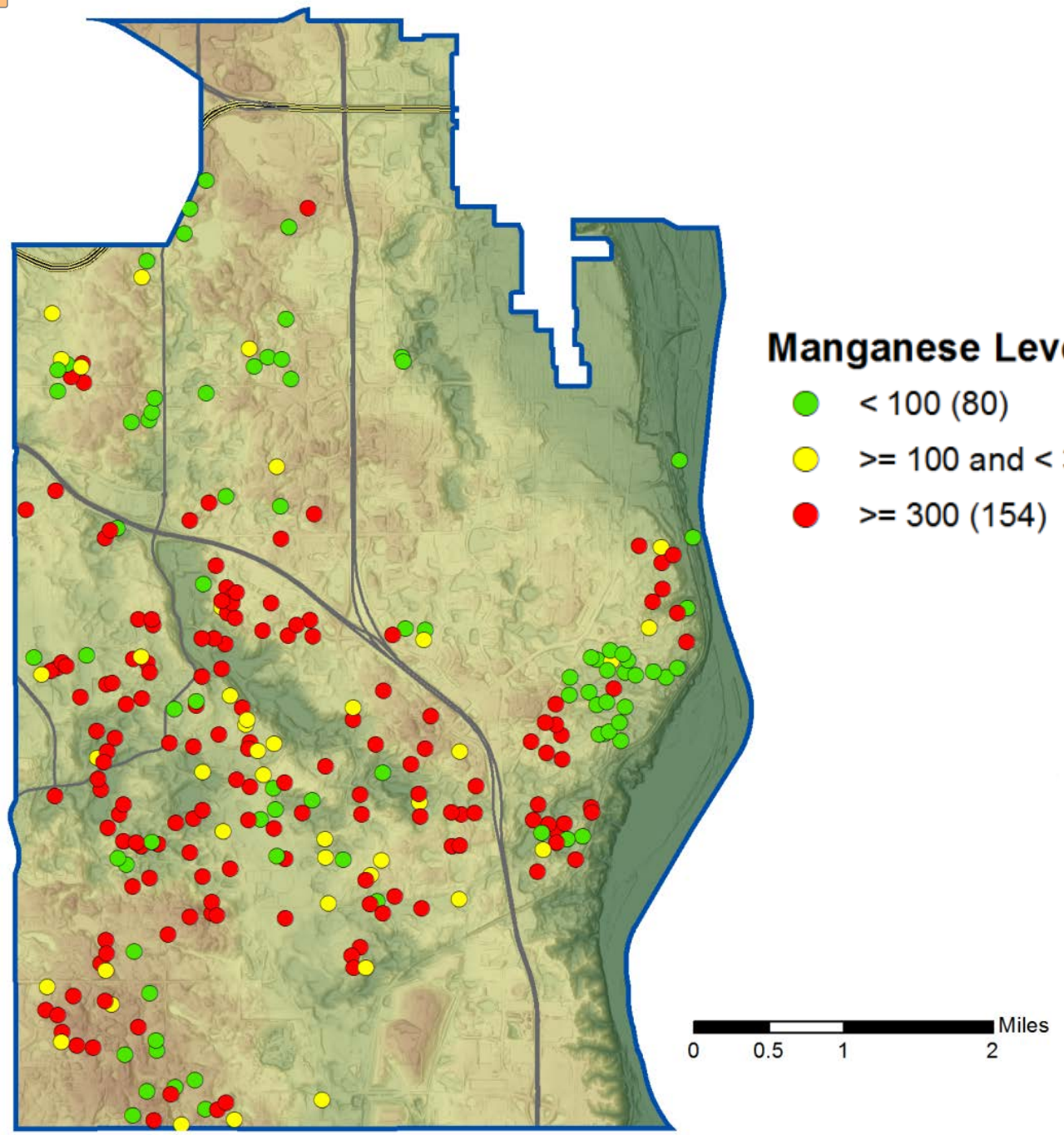
Study methods cont'd

Besides manganese, outdoor tap samples tested for:

- Coliform bacteria
- Nitrate
- Arsenic
- Lead*
- Fluoride

Customized results packets mailed to each participating household. If a result was high, additional info & suggested actions provided.

Results: **manganese levels**



	Outdoor spigot	Indoor faucet
# of samples	274	99
Average level (µg/L)	528	167
Above 100 µg/L	71%	37%
Above 300 µg/L	56%	26%

Results: **Do people drink the water?**

Household survey

At higher levels of manganese, there was increase in…

- Concern about “taste, odor or color of their water”
- Concern about “iron and other minerals”
- Treating or softening water or using bottled water (modest increase)

Some evidence of greater awareness of cosmetic issues & increased mitigation

Results: **Do people drink the water?**

Inside tap

- 78% of those with manganese level between 100-300 µg/L regularly drink the water.
- 85% of those with manganese level above 300 µg/L regularly drink the water.

Elevated manganese in tap water does not always deter someone from drinking it

Results: **manganese treatment**

- ✓ **Water softeners:** very effective
- ✓ **Carbon filters** may reduce manganese but often not to below 100 µg/L
- ✓ **Reverse osmosis** (shown in other studies)

- X **Sediment** and **iron filters**: no effect

Results: **other contaminants**

- **Coliform Bacteria**
- Nitrate
- Arsenic
- Lead
- Fluoride

- ❑ Present in 25% of wells
- ❑ Typical for MN
- ❑ One well positive for E. *coli*

Results: **other contaminants**

- Coliform Bacteria
- **Nitrate**
- Arsenic
- Lead
- Fluoride

❑ Levels did not exceed EPA drinking water standard

Results: **other contaminants**

- Coliform Bacteria
- Nitrate
- **Arsenic**
- Lead
- Fluoride

- ❑ Detected in 56% of wells
- ❑ 3 wells exceeded EPA drinking water standard of 10 µg/L

Results: **other contaminants**

- Coliform Bacteria
- Nitrate
- Arsenic
- **Lead**
- Fluoride

- ❑ 53% had lead detected at outside spigot
- ❑ Follow-up sampling at homes with high lead found no or very low levels at inside drinking water faucet

Results: **other contaminants**

- Coliform Bacteria
- Nitrate
- Arsenic
- Lead
- **Fluoride**

- ❑ very low levels
- ❑ below recommendation of 0.7 mg/L for good oral health

Recommendations Based on WIISE Study

Well owners in northern DC should test for manganese once:

- If infant is drinking water, manganese goal is below 100 µg/L at drinking water faucet
- If no infant in household, goal is below 300 µg/L

If manganese is above goal of household, consult local water treatment specialist

- Softened water not recommended for bottle feeding due to sodium added by softener
- Test water after treatment installed to ensure device is achieving manganese goal
- Maintain device per manufacturer's directions

Bottled water an option: manganese must be below 50 µg/L (except "mineral water")

Full report available:
http://www.health.state.mn.us/divs/eh/risk/studies/wiisereport.pdf

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