Pathogens in Public Drinking Water Wells

The Minnesota Department of Health (MDH) is nearing completion of a research study related to a request by the 2013 Minnesota Legislature. The study focus is the occurrence of pathogens (microbes that can make someone sick) in Minnesota public drinking water wells. While public water systems are regularly inspected and tested for many contaminants, we have limited information about the occurrence and effects of some pathogens. Pathogens can get into wells when feces from leaky sewer lines, septic systems, livestock operations, or wildlife are able to get into the groundwater or directly into the well. If adequate treatment is not provided, people who drink water contaminated with pathogens may become sick. How many people get sick in Minnesota from pathogens in drinking water is unknown.

The research used water sample collection, monitoring, and analysis. A small subset of systems participated in a study of illness in the surrounding community. The study does not include private drinking water wells. Results will be used to evaluate public health risk and develop strategies to reduce risk.

During the study, MDH sampled untreated source water from 145 public drinking water supply wells. Most wells were sampled every other month for either one or two years. We tested samples for pathogens (viruses, bacteria and protozoa) primarily using a method that detects the genetic material (like DNA) of pathogens in the water.

Study Findings

- Most wells (70%) had at least one detection of pathogen genetic material. However, only 22% of overall samples had a detection. This indicates that pathogen occurrence is irregular and is likely only under certain conditions.
- We are continuing to research the conditions needed for pathogen detection.
- There is evidence that pathogens are able to get into public water sources. We do not know how they get there or if they cause illness. Some systems may have adequate treatment to protect against pathogens.
- Site investigations are underway at wells with stronger evidence of pathogen contamination to look for a contaminant source and/or pathway. These investigations will inform recommendations and future work.

Future Plans

MDH and study partners will complete a full analysis of all study results to date. Additional funding has been requested to:

- Study the transport of pathogens to public wells, and
- Continue to study potential connections between pathogens in public wells and community illness.

Recommendations

After completion of the study, MDH will assess the need for recommendations to reduce the risk of exposure to pathogens. Changing a public water supply's groundwater source or treatment is not simple. MDH will need to study individual supplies to make sure actions taken to reduce pathogens do not cause increases in other risks. Actions to prevent or reduce exposure to pathogens must be cost-effective. Possible actions include:

- Improving prevention measures to keep pathogens from getting into public water supply wells or aquifers
- Repairing or replacing problematic public wells
- Adding treatment

Monitoring for pathogens is complex and expensive. Understanding how pathogens get into aquifers and wells may help us find a cost-effective way to predict problems and take preventive action.

Individual consumers always have the option to take precautionary actions to prevent or reduce exposure to contamination. Options for added protection against pathogen contamination include using bottled or boiled water for drinking and cooking or installing a point-of-use reverse osmosis filter at the kitchen tap. If a consumer is going to install treatment, MDH recommends following the steps at Home Water Treatment (https://www.health.state.mn.us/communities/environment/water/factsheet/hometreatment.html)

Communication Strategies

MDH will communicate the results of this study by:

- Sending specific results directly to study participants
- Providing information to public water supplies that they can use to inform consumers
- Providing presentations to interested parties

For More Information

For more information about the study, contact MDH Drinking Water Protection at 651/201-4700.

Minnesota Department of Health
Drinking Water Protection
625 Robert Street North
PO Box 64975
St. Paul, MN 55164-0975
651-201-4700
www.health.state.mn.us

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