



## Summary Report for Hill County *Giardia* Cases, 2024

### *Giardia* Background

*Giardia* is a tiny parasite that causes diarrheal illness. Consumption of contaminated water is a primary risk factor for *Giardia* infection (giardiasis) and is the primary risk factor for illness among most giardiasis cases in Montana. In Montana in 2023, 58% of the year's giardiasis cases had exposure to recreational water or consumption of untreated water as their primary risk factor for illness. Although exposure to animals is a possible means of transmission of *Giardia*, the type of *Giardia* that infects household pets such as cats and dogs is not normally the type that infects humans, and the risk of getting infected from these animals is low. *Giardia* can also be transmitted from person to person, or through contaminated food. People normally start experiencing symptoms of a *Giardia* infection about 7-10 days after being exposed to the parasite.

### *Giardia* in Hill County

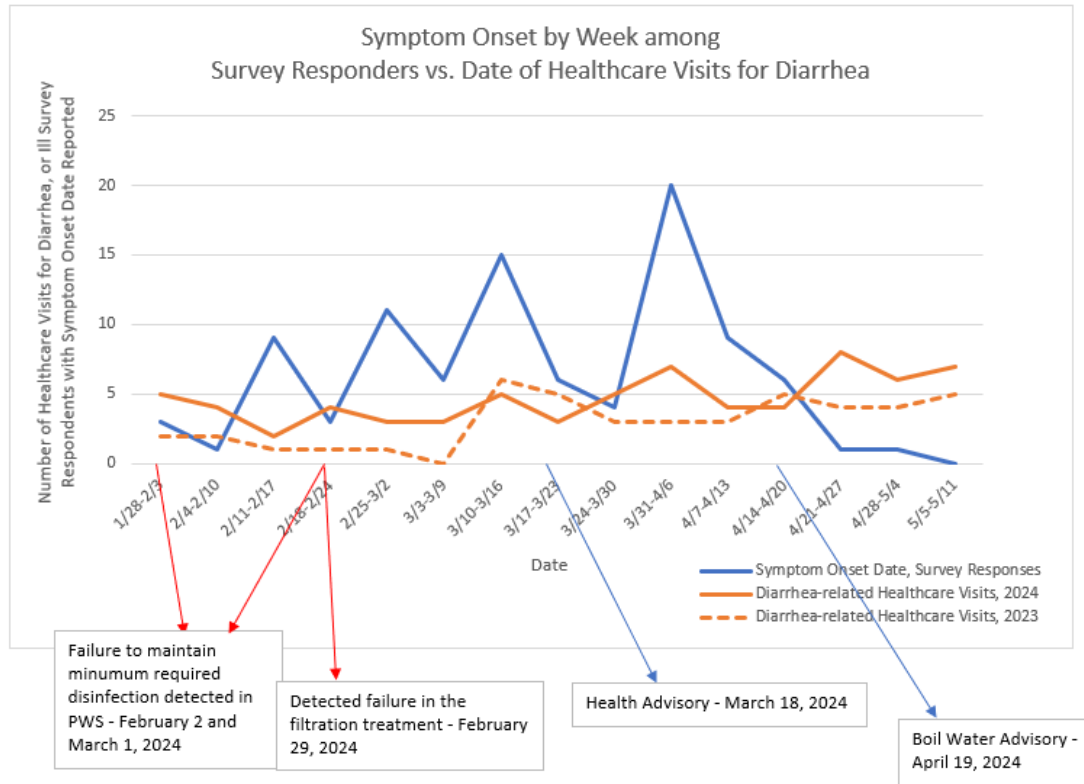
From January 1 to May 16, 2024, there were three confirmed giardiasis cases (people who tested positive for *Giardia*) among Hill County residents reported to Hill County Public Health. This is a notable number of cases for Hill County, which normally reports less than one *Giardia* case a year. There have only been two cases of *Giardia* reported in Hill County in the past five years (2019-2023).

A public health investigation found that all three confirmed cases were City of Havre residents and experienced symptoms beginning in February or early March of this year. The three cases did not report exposure to recreational water sources, or travel to areas known to have limited access to safe drinking water, such as other countries. The three cases lived in homes whose water came from the City of Havre Public Water Supply (PWS) and all consumed water from this source. There were multiple dates in February and March 2024 in which there were known issues with the disinfection and filtration in the city water supply causing the water to not meet Safe Drinking Water Act standards (Figure 1).

In addition to these three confirmed cases, other community members reported experiencing gastrointestinal symptoms that began in 2024. From April 23 to May 16, 2024, the Hill County Public Health Department and the Montana Department of Public Health and Human Services conducted an online public health survey to further characterize gastrointestinal (GI) illness that may have occurred among City of Havre residents in 2024. There were 227 individuals who completed the survey and provided information about their water consumption from various water sources, GI illness symptoms, symptom onset date, length of illness, and other possible exposures. Since February 1, 2024, 95 people self-reported symptoms consistent with the description of a *Giardia* infection, with the gastrointestinal illness (e.g., diarrhea, nausea, stomach cramps, etc.) lasting one week or longer.



Figure 1.



The orange lines in Figure 1 show the number of healthcare visits for diarrhea reported among Hill County residents, in 2023 (dashed) and 2024 (solid). The healthcare data are reported based on the date of the healthcare visit. The blue line shows the self-reported onset date of GI symptoms for the 95 survey respondents who were determined by public health to have experienced possible undiagnosed *Giardia* infection (described above).

- There was a 56% increase in the total number of healthcare visits for diarrhea among Hill County residents between the end of January and early May 2024, compared to the same time frame in 2023.
- The first disinfection failure was identified in the public water supply on February 2, 2024. Surveillance data for the two-week period following the 2024 disinfection failure compared to the same time period in 2023 showed a 100% increase in healthcare visits for diarrhea among Hill County residents.
- In the two weeks after the detected filtration failure on February 29 and the disinfection failure on March 1, there was a 33% increase in healthcare visits for diarrhea among Hill County residents, compared to the same two-week period in 2023.
- New symptom onset among survey respondents began to decrease after the Boil Water Advisory (BWA) was issued on April 19, 2024 and it was recommended that community members switch to bottled water or boiled water. Boiling water for one minute is known to kill *Giardia*.



- Healthcare visits for diarrhea increased after the BWA was announced. The healthcare data are a reflection of when an individual visited a doctor, not when symptoms began.

### Environmental Testing

Montana Department of Environmental Quality (DEQ) staff collected a raw water sample from the City of Havre PWS on May 1, 2024. Environmental testing was performed by a private laboratory, which detected *Giardia* and *Cryptosporidium* in the raw water collected that day. The positive results for *Giardia* and *Cryptosporidium* in the raw water show that the parasites can be present in the source water, and further emphasizes the need for proper filtration and disinfection of the public water supply prior to consumption.

Two additional water samples were collected on May 1 and May 2, 2024. These consisted of treated water from the PWS and were both negative for *Giardia* and *Cryptosporidium*. Additional environmental testing was performed on a sink filter and three reverse osmosis filters from one confirmed *Giardia* case's home. The filters were negative for *Giardia* and *Cryptosporidium*. Due to the small volume of processed water samples obtained for testing, the results should be interpreted with caution. The lack of a positive result does not rule out water as a source of *Giardia* exposure.

### Conclusion

Based on environmental testing results indicating that *Giardia* and *Cryptosporidium* can be present in the source water of the water treatment facility, the known issues with disinfectant and filtration within the City of Havre Public Water Supply System in February and March 2024, the fact that untreated water is a primary risk factor for infection with *Giardia*, and the lack of other compelling risk factors identified during case investigations, it is likely that the three individuals with confirmed giardiasis became sick with *Giardia* after drinking water from the City of Havre's Public Water Supply. Further, it is possible that at least 95 additional residents of Hill County became sick with *Giardia* or another unidentified waterborne GI pathogen after drinking water from the City of Havre's Public Water Supply. However, the public health investigation cannot confirm that these additional individuals were sickened with *Giardia* or another waterborne pathogen nor can the investigation confirm that the City of Havre Public Water Supply was the source for these additional cases. The possibility remains that other residents were sickened but were not identified because they did not seek medical care or visit a doctor for testing or did not respond to the public health survey. The possibility of duplicate survey entries cannot be ruled out – multiple entries were submitted under one IP address, but this may be attributed to different family members submitting survey responses from one device.