SEWAGE SLEUTHS

Using Wastewater Surveillance for Illness Prevention Communications

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ABSTRACT

We aimed to create accessible and actionable data visualizations with hopes that Milwaukeeans could quickly and easily assess when and how they want to engage in protective measures for themselves and their community.

The City of Milwaukee Health Department (MHD) sought to simplify wastewater surveillance communications and leverage surveillance for protective actions. Milwaukee is the largest municipality in Wisconsin and is fortunate to have a National Wastewater Surveillance System (NWSS) Center of Excellence (CoE) at the state level. With the Wisconsin Department of Health Services Wastewater Monitoring Program providing detailed metrics on COVID-19 wastewater surveillance, an opportunity presented itself at MHD to use simplified data visualizations on wastewater surveillance with the knowledge that community members could always find more detailed data from the State. This allowed us to shift our focus to tailoring communications to our specific community and administer message testing to evaluate effectiveness. The clarity and utility of our dashboard and website were evaluated by conducting cognitive interviews and teach back methods to various audiences.

PILOT DASHBOARD DEVELOPMENT

Our pilot dashboard was developed using COVID-19 wastewater surveillance from the MHD Laboratory during the 2023-2024 respiratory illness season. As the MHD Laboratory adds RSV and influenza to the wastewater surveillance testing, the dashboard is being transitioned to a respiratory illness wastewater surveillance dashboard to be incorporated into MHD's respiratory illness website during the 2024-2025 respiratory illness season. This decision aligns with broader State and Federal choices to transition away from individual viral seasons and use "respiratory illness season" in communications.
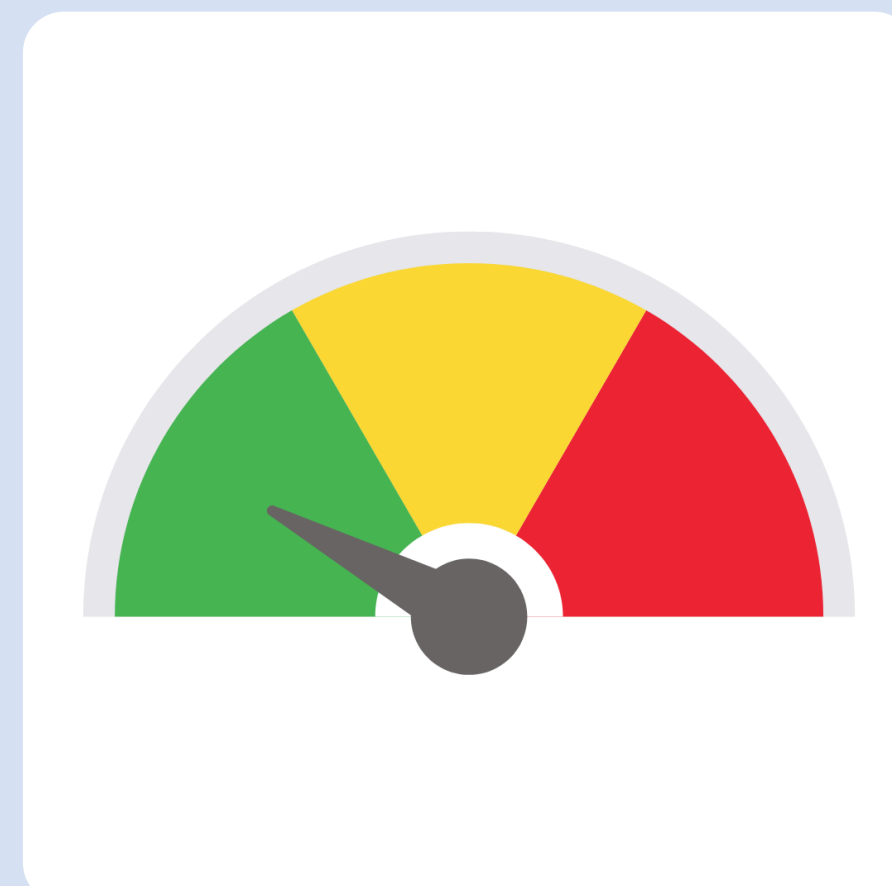
Incorporating Equity in Messaging: *Accessible Language*

To make the dashboard as accessible as possible MHD:

- Avoided jargon when possible
- Simplified data visualization
- Kept the number of figures on the dashboard minimized
- Included instructions for how to interpret each tile
- Incorporated feedback from our community in the framing of mitigation strategies

Utility of Messaging: *Stoplight Warning System*

To promote utility, we developed the Stoplight Warning System as a central part of the dashboard and website. This allows the audience to easily identify if respiratory illness levels are low, moderate, or high, and quickly connect those with tangible protective measures they can take. The mitigation strategies below align with the CDC COVID-19 Community Levels guidance. MHD made small modifications to the language to respond to feedback from the community on inclusivity and frame disease prevention as a community effort rather than strictly for individual health. The categories are determined by averaging the most recent three measurements and calculating a percentile comparing that average to the last six months of data. That percentile is classified into tertiles to create the low, moderate, and high categories. MHD intentionally used tertiles instead of the more commonly used quintiles in order to make interpretation more intuitive to the general public.

LOW CATEGORY

- Stay up to date on vaccination
- Avoid contact with people who feel sick or have COVID-19
- Follow recommendations for isolation if you have COVID-19
- Wash your hands frequently
- For additional preventative actions, talk with your healthcare provider

MODERATE CATEGORY

- Recommendations from the Low Category and
- **Wear a high-quality mask** (KN95 or surgical mask) or respirator when indoors in public if you want to maximize protection from COVID-19
- If you have household or social contact with someone susceptible to serious illness, self-testing to detect infection before contact and wearing a high-quality mask when indoors with them provides additional protection

HIGH CATEGORY

- Recommendations from the Low and Moderate Categories and
- **Wear a high-quality mask** (KN95 or surgical mask) or respirator indoors
- To maximize protection, consider avoiding **non-essential indoor activities** in public where you could be exposed

Inclusive Messaging: *A Shift in Framing*

MHD intentionally shifted the framing of mitigation strategies from an individual approach to a community-based approach. This was done to encourage people of all risk levels to use mitigation strategies to protect themselves and the people around them, decreasing the added burden high risk individuals often have to keep themselves from getting sick. Additionally, this frames the messaging in a more traditional population level lens used in public health rather than the more common individual level lens used in medicine.

For example: If a common framing of wearing a mask during periods of high transmission is...

"**If you are high risk** of getting very sick, wear a high quality mask or respirator when indoors in public."

versus

"Wear a high quality mask **(KN95 or surgical mask)** or respirator when indoors in public if **you want to maximize protection from COVID-19.**"

In this example, the first option reads as if masking is only something that people of high risk of serious illness need to do to protect themselves, even though masking is more effective at preventing disease if people of all risk levels mask. In contrast, the second option is applicable to people of all risk levels and therefore includes the whole population in advising masking to prevent disease. It is a small shift in language that changes the applicability of messaging greatly.

INTERVIEWS & MESSAGE TESTING

To assess the effectiveness of our communications efforts, we engaged in cognitive interviews and message testing throughout the summer of 2024.

Develop and implement interview guide to gauge understanding of internal staffs' comprehension of dashboard and website.

Adapt guide from internal interviews for general community audience message testing.

Administer message testing of dashboard and website during annual Back to School Health Fair.

Process results of message testing and integrate into draft materials for greater community impact.

Currently, MHD is processing results and will have integrated community feedback into the dashboard and website for its formal launch at the beginning of the 2024-2025 respiratory illness season.

EVALUATING THE MESSAGE

During the message evaluation phase of the project, we conducted cognitive interviews of 5 MHD staff who do not work on the wastewater program. This helped us modify and improve the questions on the evaluation so that it was more refined for the message testing in the community.

The format of the message testing included presenting materials for review (i.e. existing pilot dashboard, existing respiratory illness website, and mock-up of new respiratory illness dashboard) to participants and having the interviewer ask a series of questions related to the materials. While this was happening, a separate note taker recorded the responses of the participant for future analysis.

Sample Questions:

What are you looking for when you click around the dashboard?

On a scale of 1-10, how likely are you to view this dashboard before going to a large public gathering, work, or a trip? Why?

Please respond to the following statement (Likert scale): I have the resources to follow through with protective next steps to protect myself and my community based on the website.

Start evaluating your communications!

We have handouts of our full interview guide available - no need to reinvent the wheel. We asked these questions in an interview format, but they can easily be adapted for focus groups or surveys. Many of our questions were based on a guide developed by Public Health Madison Dane County that they used to evaluate their respiratory illness dashboard.

LIMITATIONS

The results of our message testing apply to our community in Milwaukee, and may not translate to other municipalities or states. Because of this, it is important to keep a pulse on your community and conduct your own message testing. Additionally, our message testing was done on a small subset of Milwaukeeans and may not necessarily apply to everyone living in the city. Consistent community feedback opportunities are needed to ensure the message is appropriate for our audience.

ACKNOWLEDGEMENTS

CITY OF MILWAUKEE HEALTH DEPARTMENT

Questions?
Please email Cait McCrory at **camccr@milwaukee.gov**

View the dashboard online!
milwaukee.gov/Wastewater