

From Turds to Data

Developing a Front Facing Wastewater Monitoring Program

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Wastewater Monitoring: A Team Effort

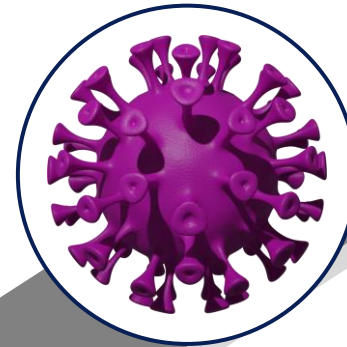
Community

Community members that are infected with pathogens can shed virus in their feces with or without symptoms.



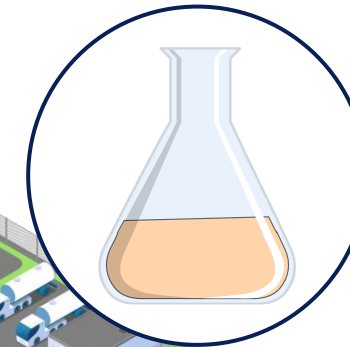
Pathogen

A pathogen enters the population through exposures or new mutations.



Utility

Before wastewater is treated, utility workers collect samples under consistent conditions to gather information about the virus.



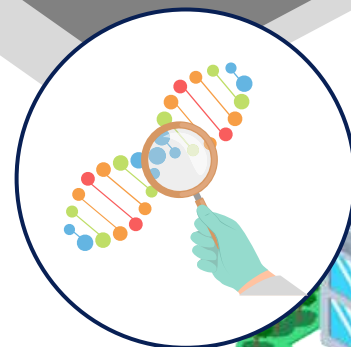
Public Health

Public health officials use wastewater data to understand disease trends in communities and make decisions, such as where education, testing, or vaccination clinics would best be utilized.



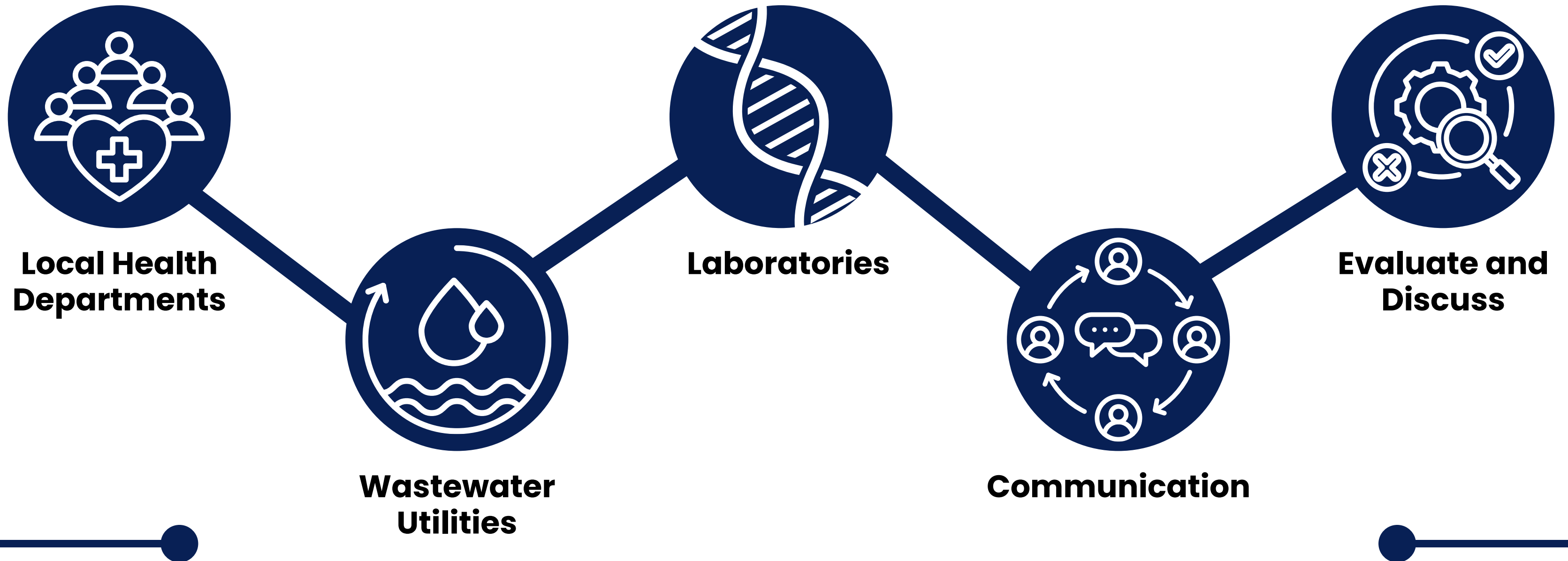
Laboratory

Laboratories use validated methods to test for the pathogen and measure concentrations. This data investigates understanding of quantities of virus in the community.



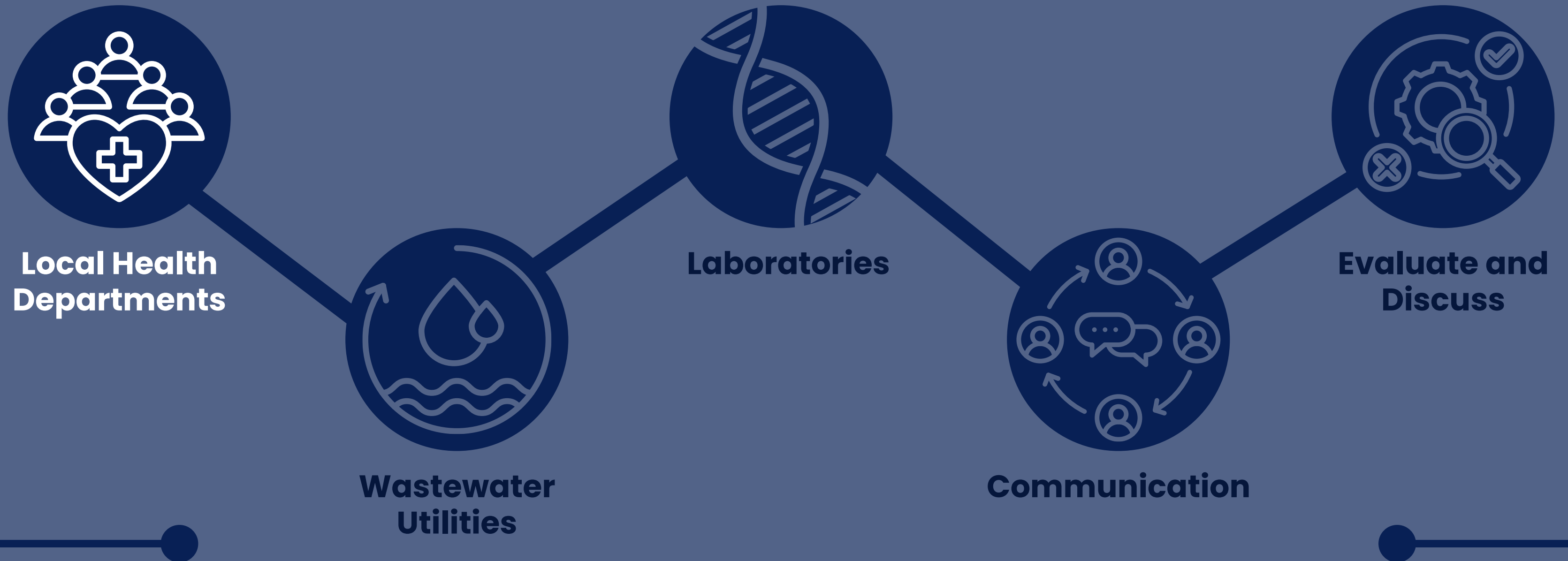
Wastewater Monitoring Goal

Track disease targets so communities can act quickly to stop the spread of disease.



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Wastewater Monitoring and Public Health

10 Essential Public Health Services

01 Monitor wastewater for pathogens

02 Real-time historical data to understand disease patterns over seasons

03 Local dashboards updated in real time for community health concerns

04 Multi-sector partnerships and coalitions can make informed decisions

09 Evidence based monitoring to help improve accuracy in reporting and understanding



Wastewater Monitoring and Public Health

 **Interpretation**

 **Data Reliability**

 **Building Trust**

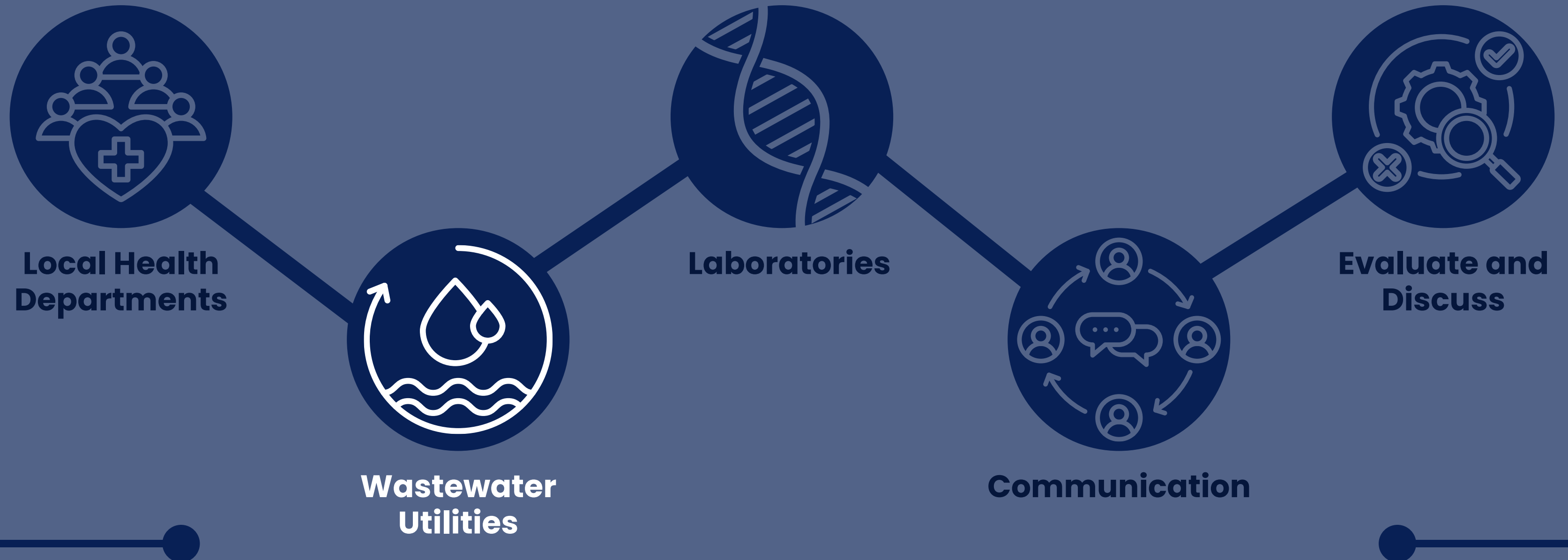
 **Community Education**

 **Historical Context**

 **Privacy and Ethics**

Wastewater Monitoring Goal

Track disease targets so communities can act quickly to stop the spread of disease.



Wastewater Monitoring and Utilities



ROLE IN MONITORING

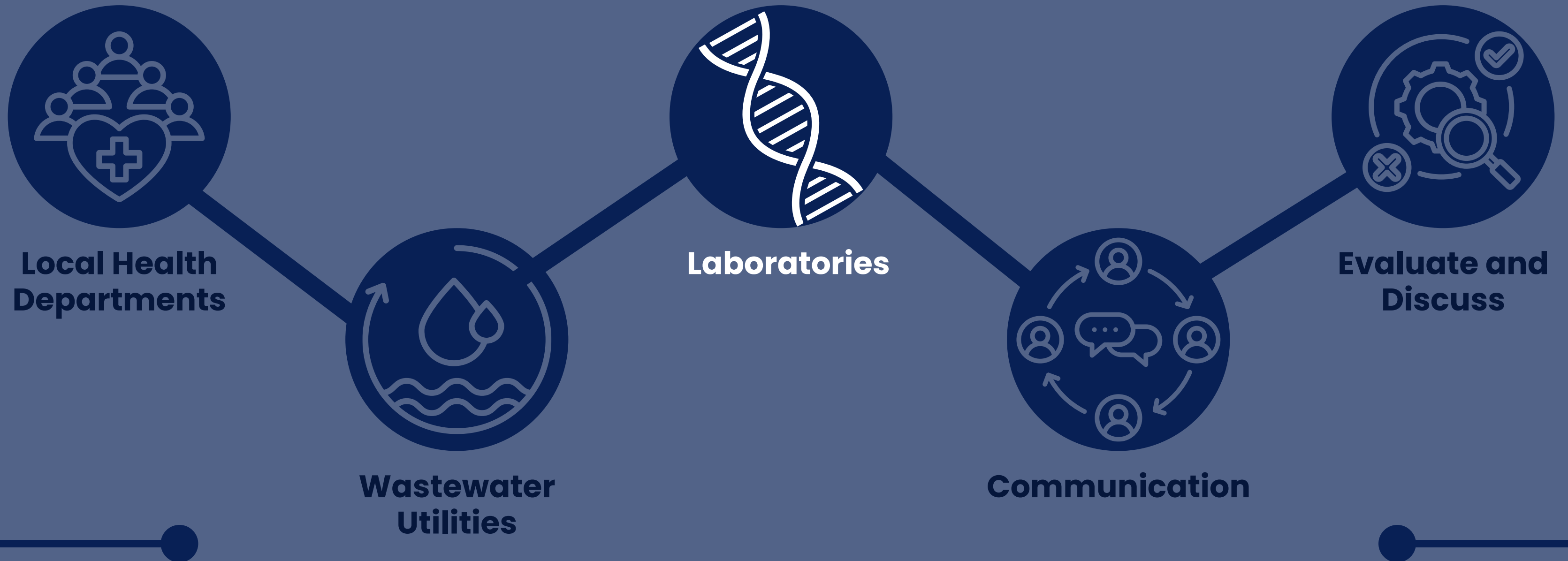


PERSPECTIVES

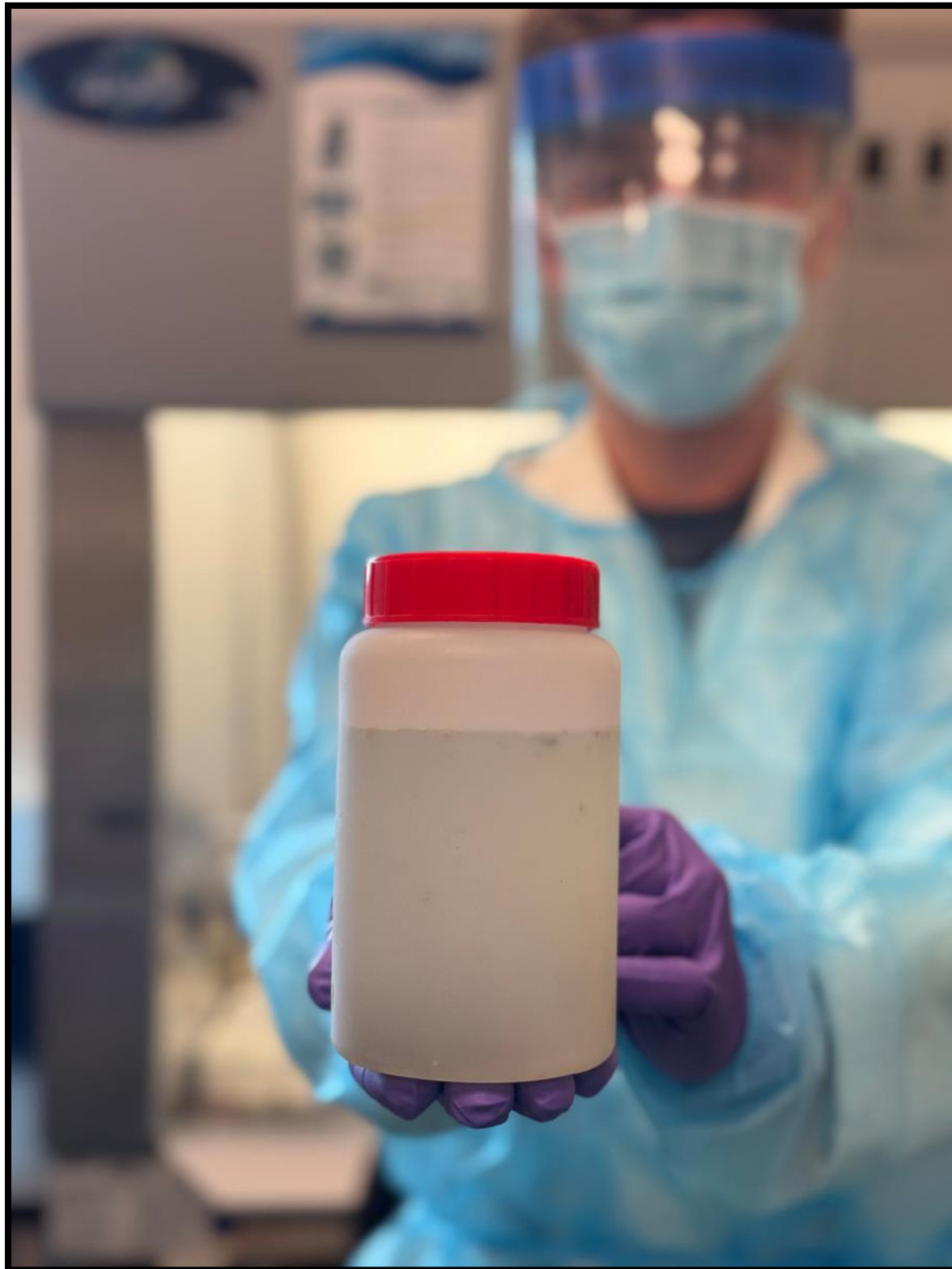
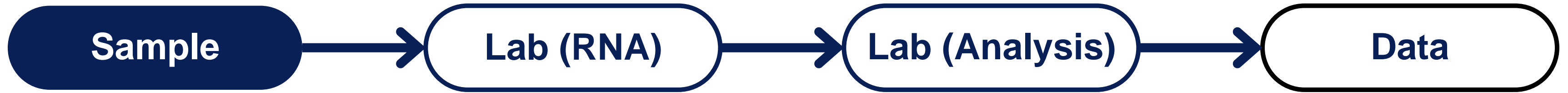


Wastewater Monitoring Goal

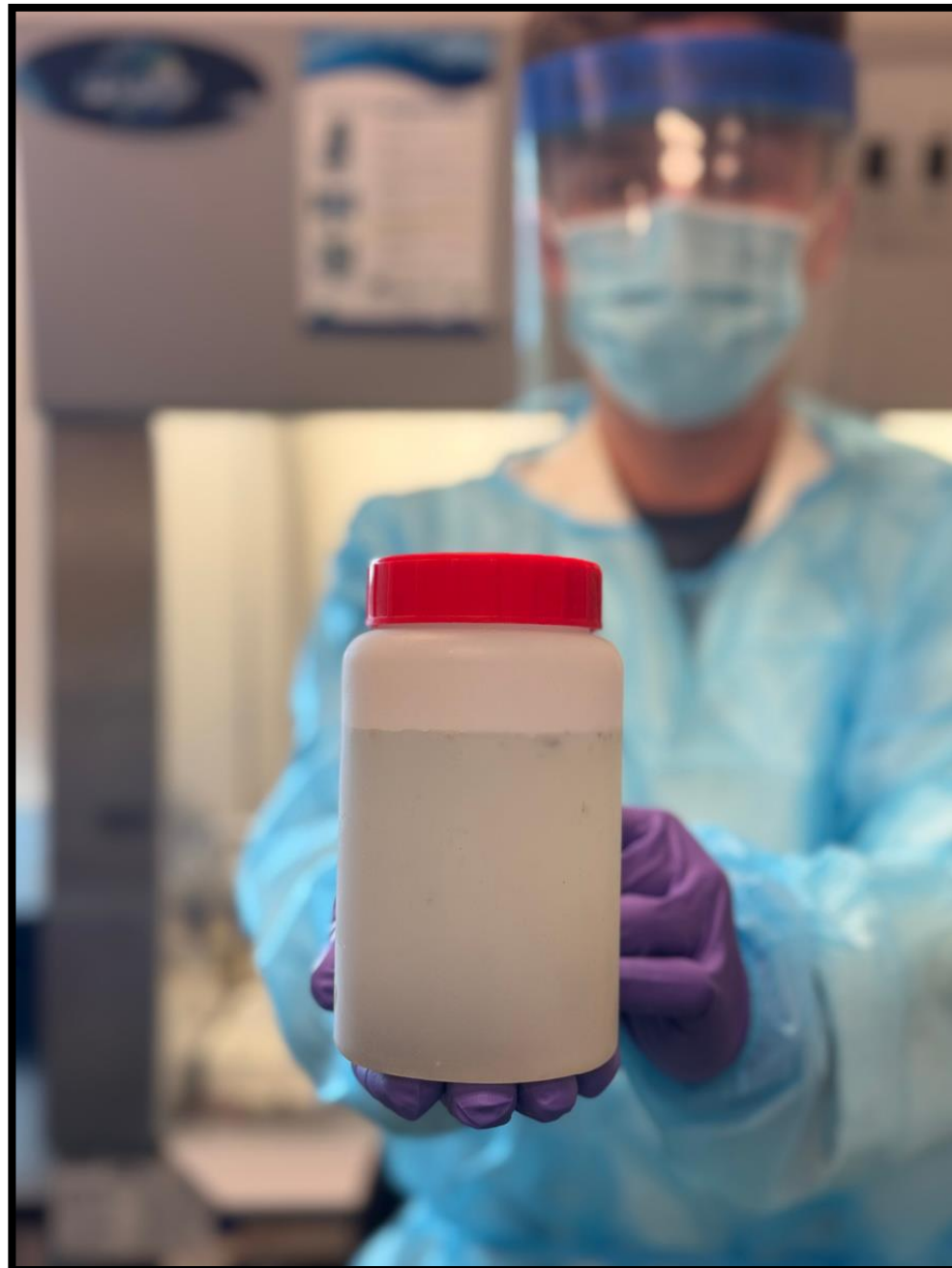
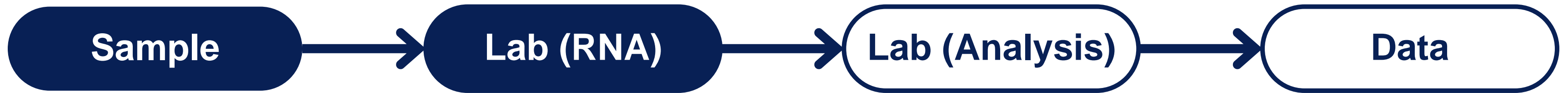
Track disease targets so communities can act quickly to stop the spread of disease.



The Science of Wastewater Monitoring



The Science of Wastewater Monitoring



Concentrate RNA



Extract RNA

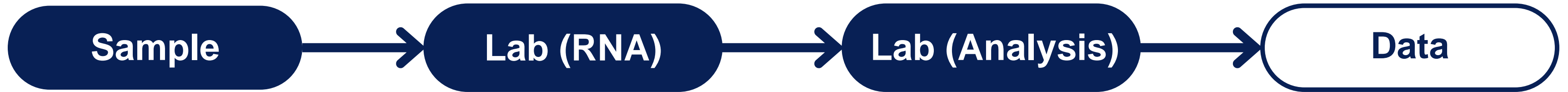


Isolate RNA

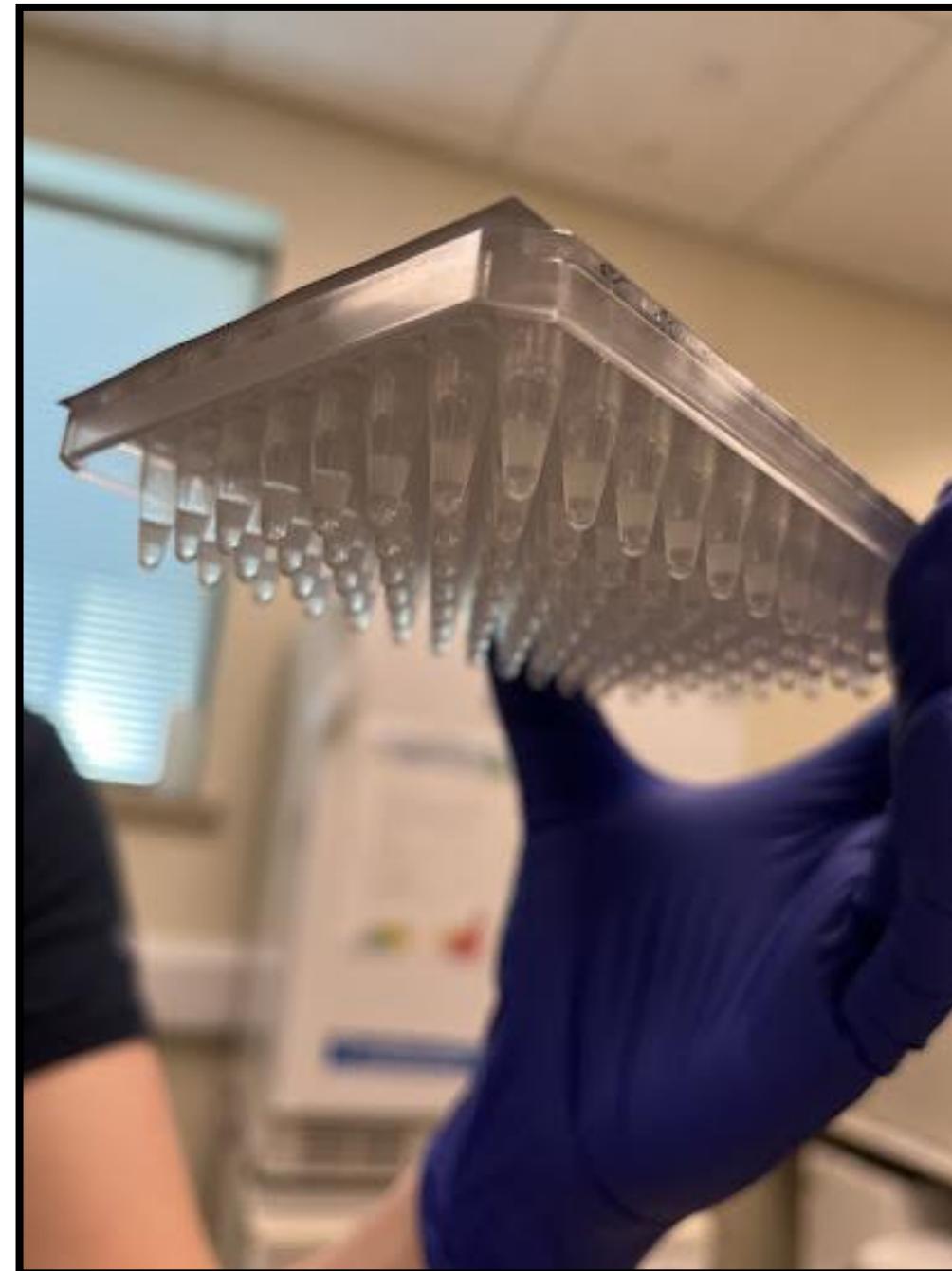


All Viral RNA

The Science of Wastewater Monitoring



All Viral RNA



Target Viral RNA

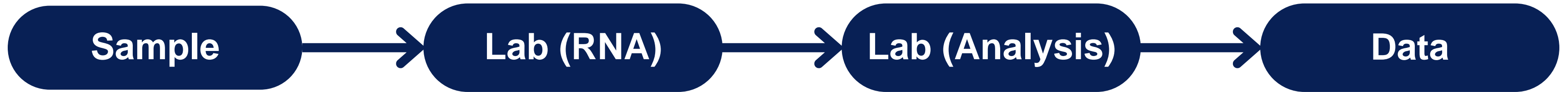
COVID-19

RSV

Influenza

Norovirus

The Science of Wastewater Monitoring



COVID-19 Muskegon County

Visualization created by Annis Water Resources Institute (GVSU)

Contact: Lexy Porter (portea@gvsu.edu)

M1 M2 M3 M5 M6 M7 M8



Source: [Michigan COVID-19 Wastewater Testing Dashboard](#)

* A Flourish chart

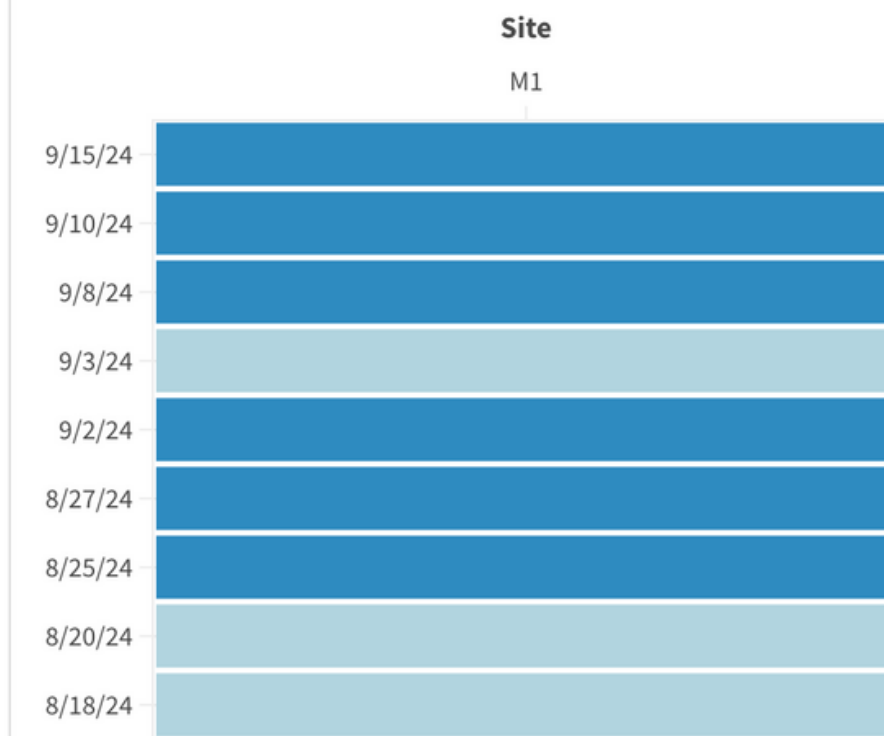
COVID-19 Risk Level Muskegon County

Visualization created by Annis Water Resources Institute (GVSU); Contact: Lexy Porter (portea@gvsu.edu)

Minimal Concern <10,000; Potential for Concern <75,000; Cause for Concern >75,000 (gene copies/100mL)

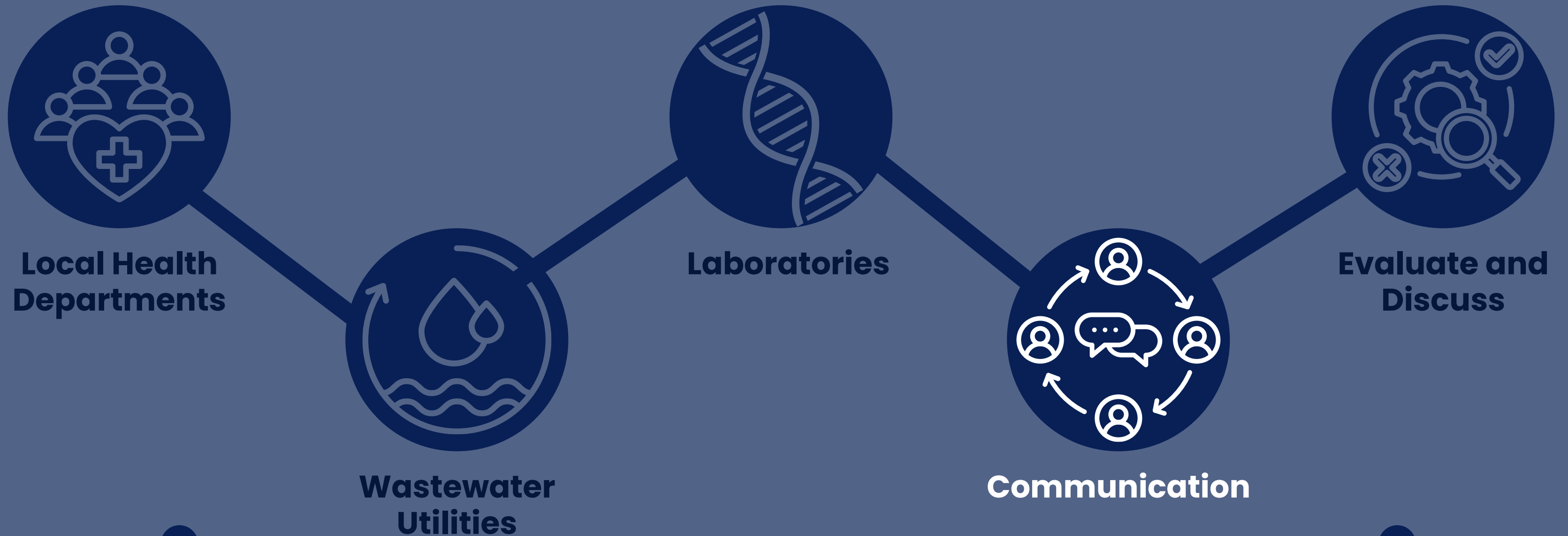
M1 M2 M3 M5 M6 M7 M8

Minimal Concern Potential for Concern Cause for Concern



Wastewater Monitoring Goal

Track disease targets so communities can act quickly to stop the spread of disease.



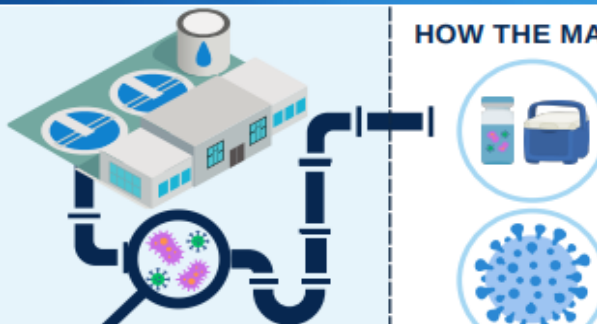
Community Forward Data Dashboard

Education and Communication of Work

Real-Time Data Accessibility

WASTEWATER MONITORING

The State of Michigan SARS-CoV-2 Epidemiology - Wastewater Evaluation and Reporting Network (S.E.W.E.R.)



HOW THE MAGIC HAPPENS

- COLLECT SAMPLES**
Wastewater samples are collected from local sewersheds and treatment plants.
- ISOLATE VIRUS**
We use Michigan's state-approved method to capture virus in the wastewater and isolate it for analysis.
- ANALYZE RESULTS**
We use molecular methods to identify and measure viruses in wastewater. Our data are reported to local, state, and federal health departments.

The State of Michigan onboarded wastewater monitoring in 2020, partnering with national and international institutions.

HOW TO USE
Wastewater data can be a valuable tool to aid in existing public health infrastructure. To use this data best:

- Utilize wastewater data in conjunction with other data (clinical, geographical context, social-behavioral)
- More data over time offers more reliable trends


GOALS

- Provide a representative community sample
- Offer data on disease dynamics where clinical testing may not be readily available
- Contribute data for different communities within a county

VALUE

- Captures pathogen signal shed from those with and without symptoms
- Can be an early indicator that circulating pathogens are increasing or decreasing
- Does not depend on an individual's healthcare access
- Can be implemented by many communities

Want to see it in action? Scan here.



Interested in learning about wastewater monitoring in your community?
www.otterlab.org

COVID-19 Muskegon County

Visualization created by Annis Water Resources Institute (GVSU)

Contact: Lexy Porter

M1 M2 M3 I





Potential Concern

Throughout **Muskegon County (M1)**, the wastewater viral activity level for COVID-19 is a **potential concern**.

Minimal Concern

Potential Concern

Cause for Concern

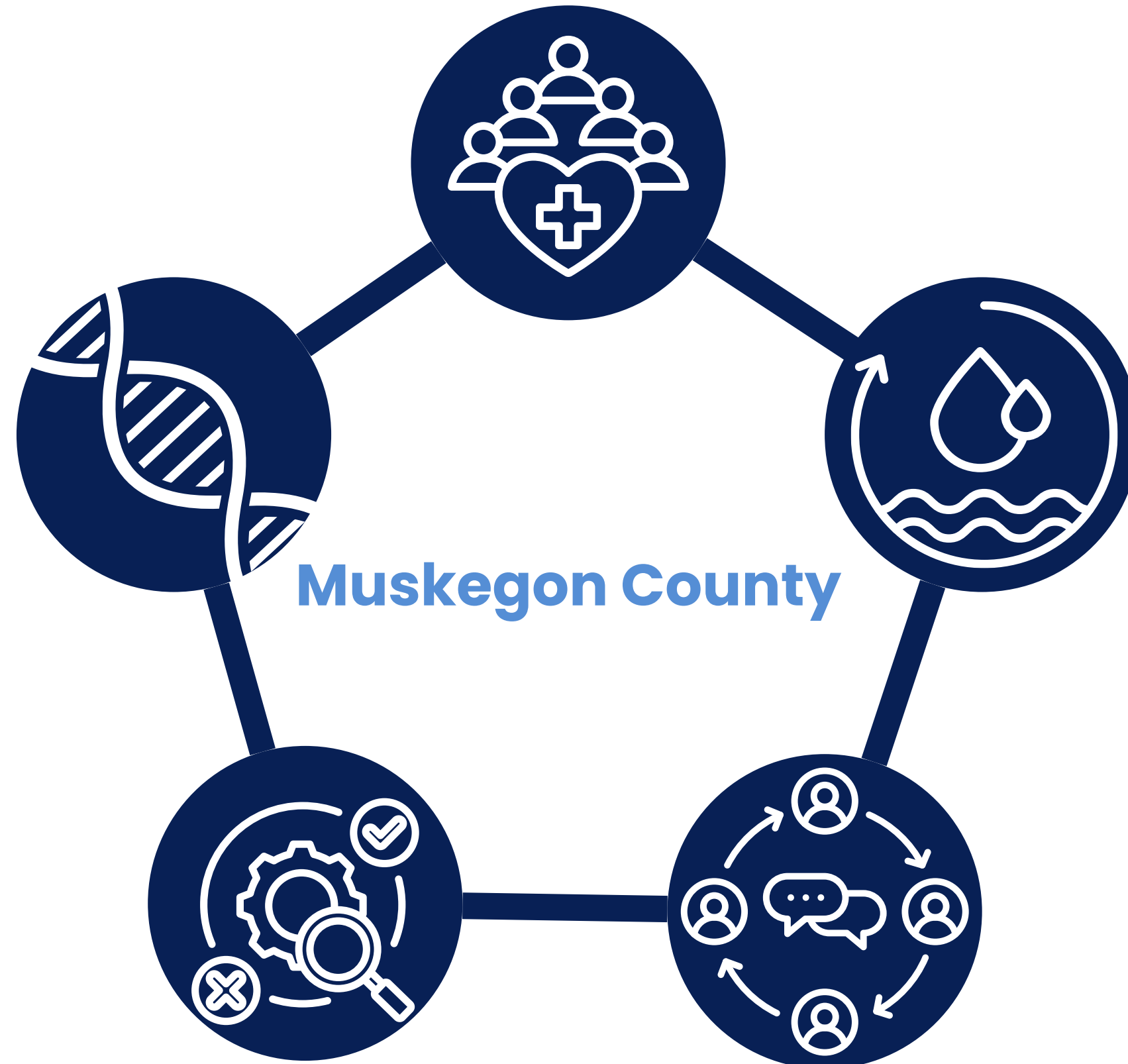
Source: Michigan C

COVID-19 Risk Level Muskegon County

*A Flourish chart 8/18/24

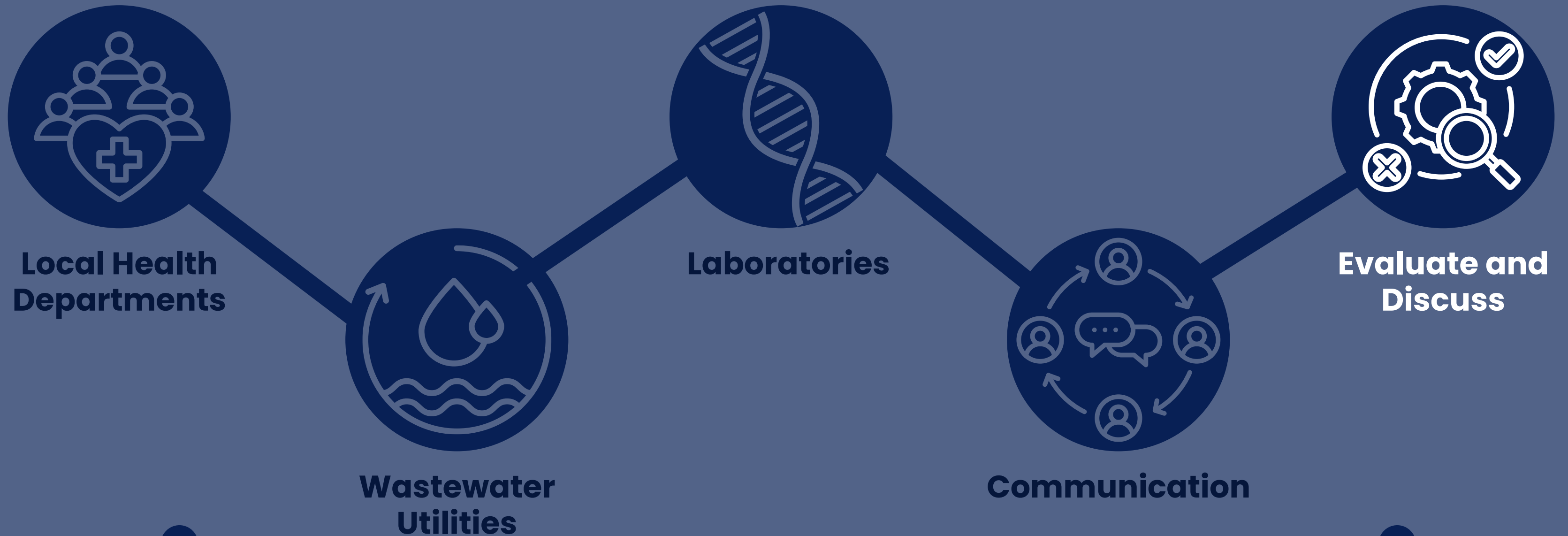


Wastewater Monitoring Program



Wastewater Monitoring Goal

Track disease targets so communities can act quickly to stop the spread of disease.



Wastewater Monitoring in Muskegon County

Question 1

What is the biggest opportunity in navigating the wastewater data?

Question 2

Wastewater monitoring was swiftly adapted as an emergency response to COVID-19, now that we are moving to a state of prevention, what do you value most for the future of wastewater monitoring?

Group Discussion



What is the biggest opportunity in navigating the wastewater data?

Wastewater monitoring was swiftly adapted as an emergency response to COVID-19, now that we are moving to a state of prevention, what do you value most for the future of wastewater monitoring?

How do you navigate wastewater data at the local level?

What is needed to increase the effectiveness of wastewater monitoring for long-term sustainability?



Thank You



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Mike Eslick



Muskegon County
Resource Recovery Center
Angeline Latsch, MS
(Formerly)

Community Forward Data Dashboard

