

Epidemiology and Bioterrorism

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Agenda

- What is epidemiology?
- Why is epidemiology important?
- MDHHS's role in epidemiology.
- What is bioterrorism?
- Michigan's emergency management system and partners.
- MDHHS's role in bioterrorism and emergency management.

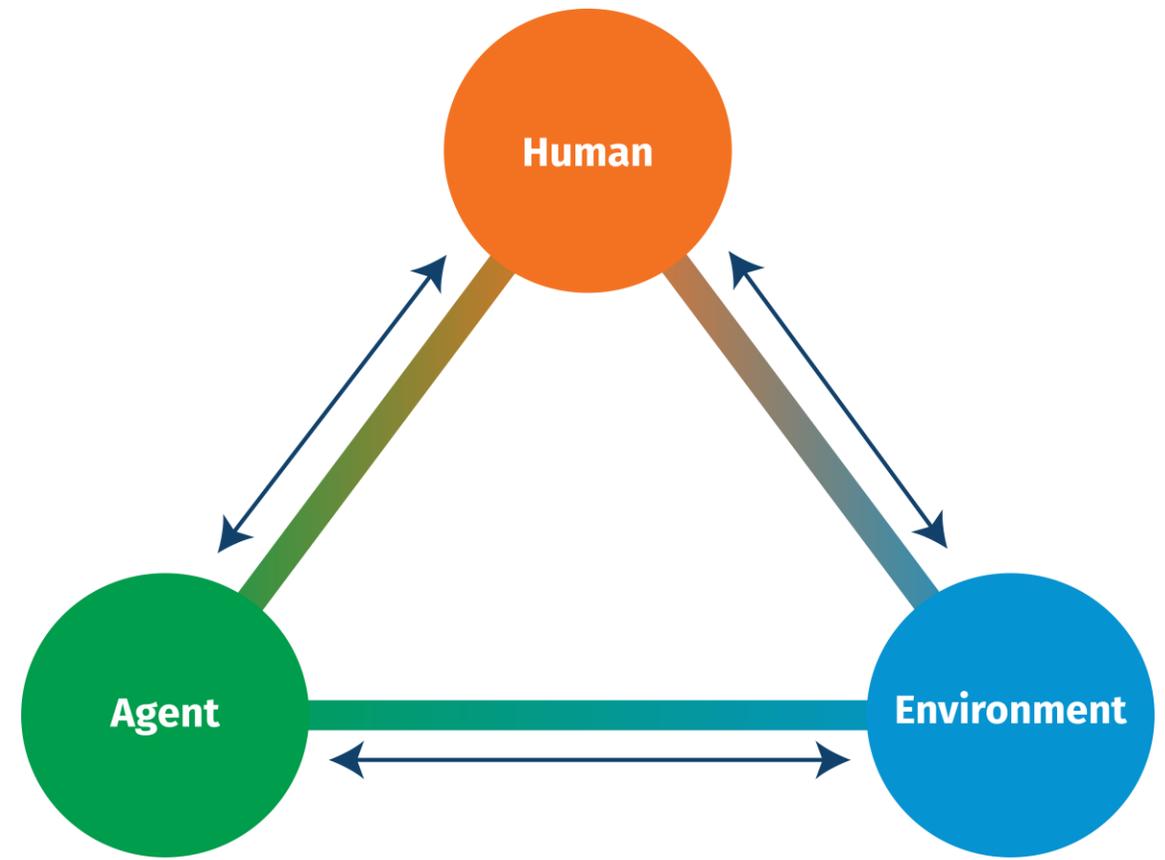


Epidemiology

What is Epidemiology?

“The study of the distribution and determinants of health-related states or events in specified populations, and the application of this to ... health problems.”

“Disease Detectives.”



Michigan's Public Health System



Local Health Departments

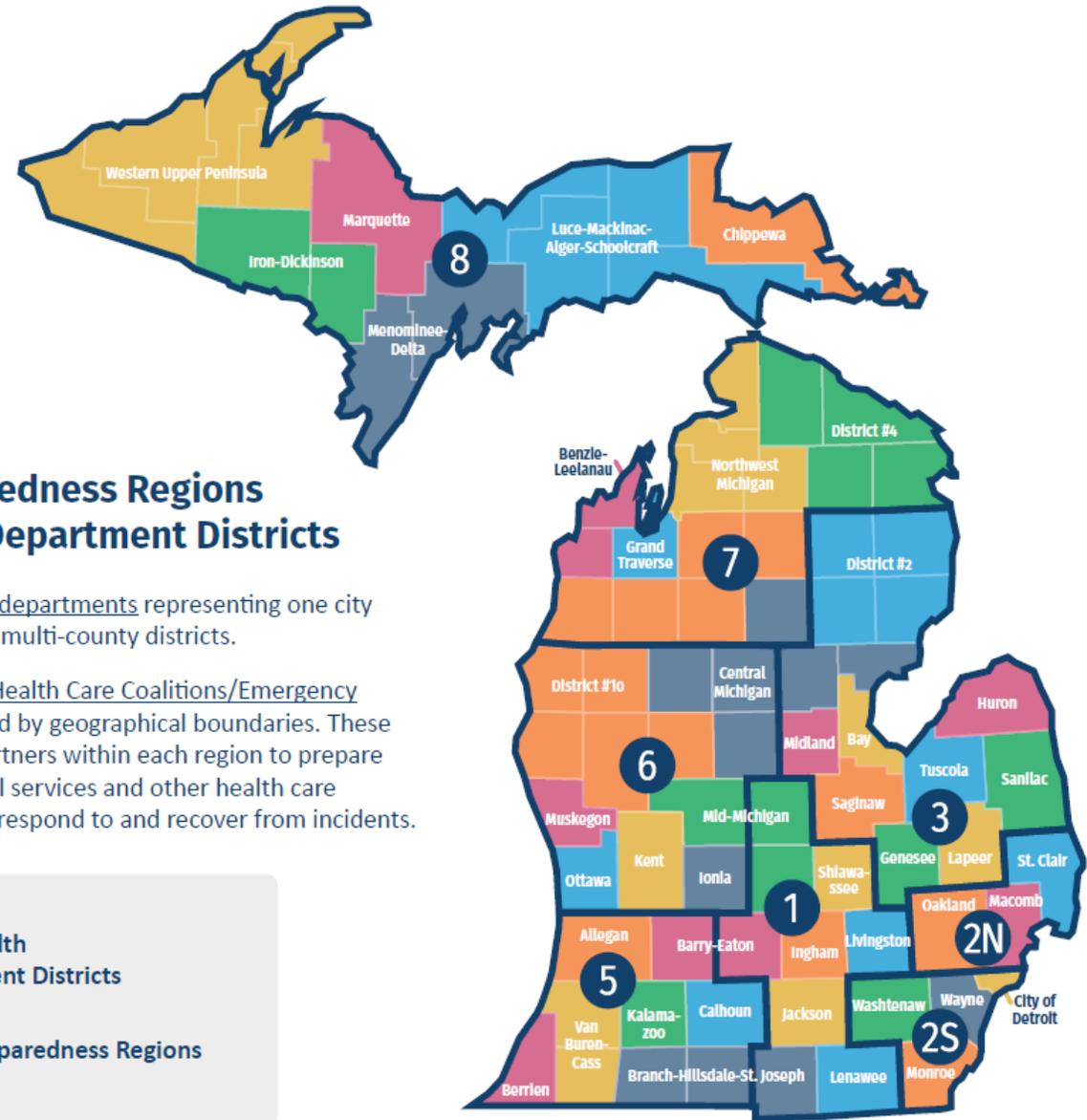
Emergency Preparedness Regions and Local Health Department Districts

Michigan has 45 local health departments representing one city (Detroit), 30 counties and 14 multi-county districts.

Michigan has eight regional Health Care Coalitions/Emergency Preparedness Regions defined by geographical boundaries. These coalitions work with local partners within each region to prepare hospitals, emergency medical services and other health care organizations to prepare for, respond to and recover from incidents.


 Local Health Department Districts


 Emergency Preparedness Regions



Why is Epidemiology Important?

- Applied epidemiology:
 - Defines and tracks diseases for informed decisions.
 - Develops effective interventions.
 - Evaluates public health services and health care.
 - Communicates data to health professionals, partners and the public.
 - Emphasizes epidemiologic methods for creating health policy.

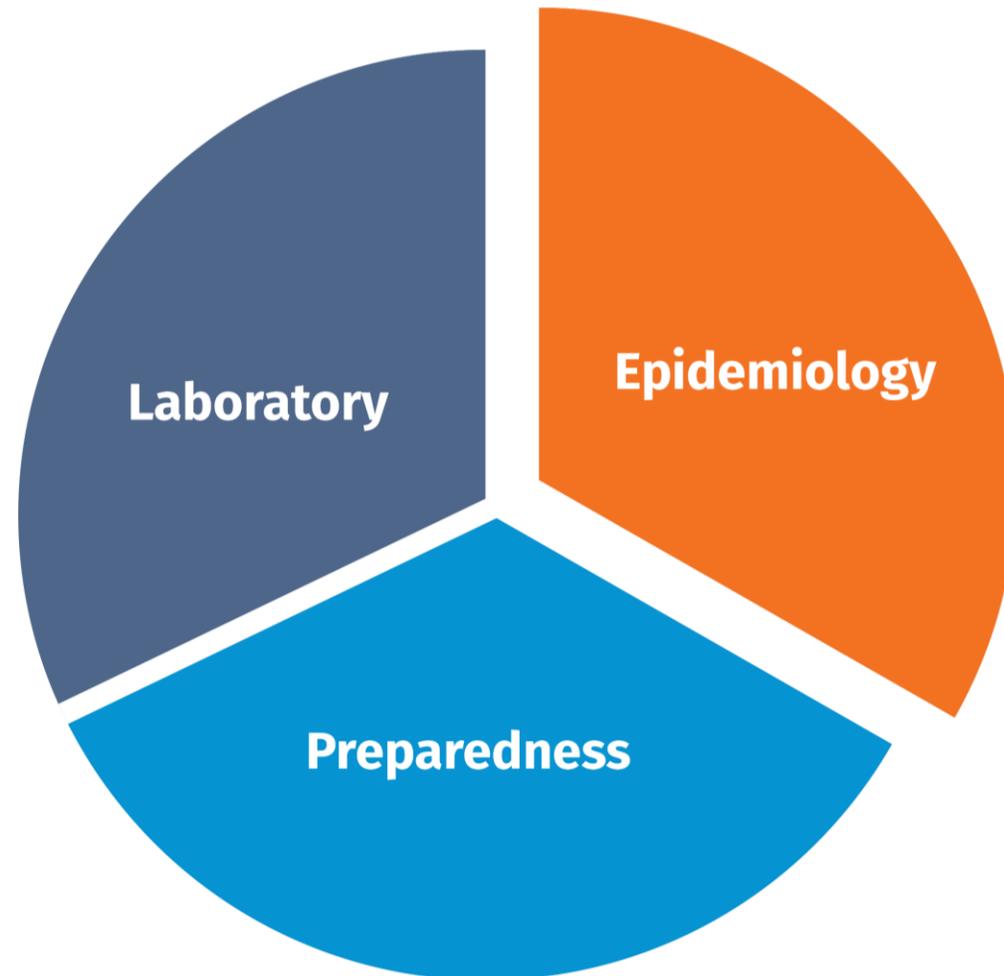


Lab and Epi: Two Sides of Same Coin

- 2022 E. coli outbreak in national restaurant chain.
- 2022 giardiasis outbreak from water filtration failure at a lodge in Canada.
- 2023 blastomycosis outbreak in wood pulp mill.
- Health care:
 - Drug resistant *S. aureus* in neonatal ICU.
 - *Candida auris* in long term acute care hospital.
 - E. coli outbreak related to gastrointestinal endoscopic procedures.
 - Tuberculosis-infected bone grafts.
 - Mass exposure to a bat in hospital.

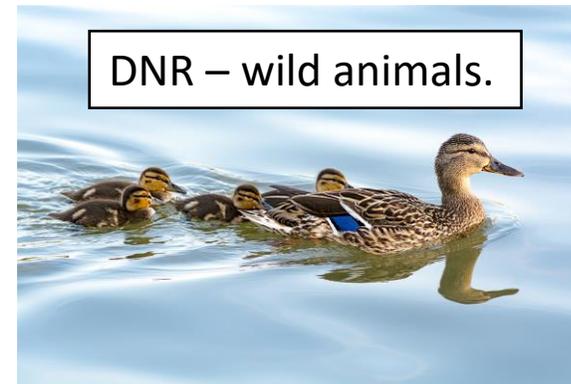


Epi-Lab-Preparedness Triad



Influenza A (H5N1): Identify, Educate and Respond

- Different agency roles for tracking spread in animals and humans.
- Human Case Detection and Response:
 - Monitor health of exposed people.
 - If symptomatic, collect samples and offer Tamiflu.
- Educate people who could be exposed to sick animals.
- Personal protective equipment.
- Information and guidance to health care providers.



Influenza A (H5N1): Serology Study

How common is H5N1 infection in people exposed to ill cows?

- 7% had evidence of recent infection with HPAI A(H5) virus.

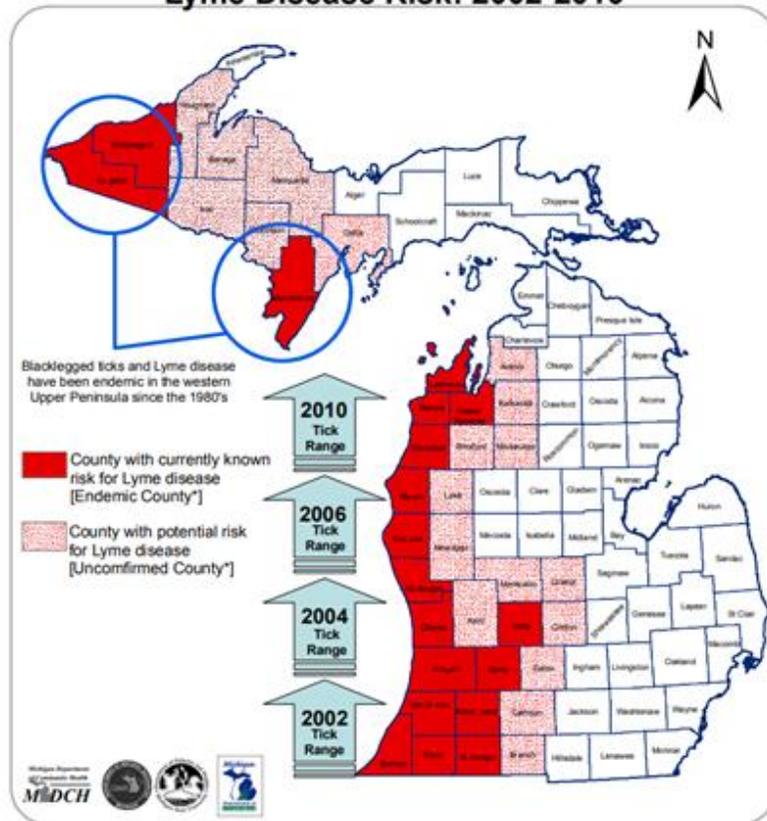
Implications:

- Active monitoring of people exposed to ill animals.
- Education of workers and animal owners.

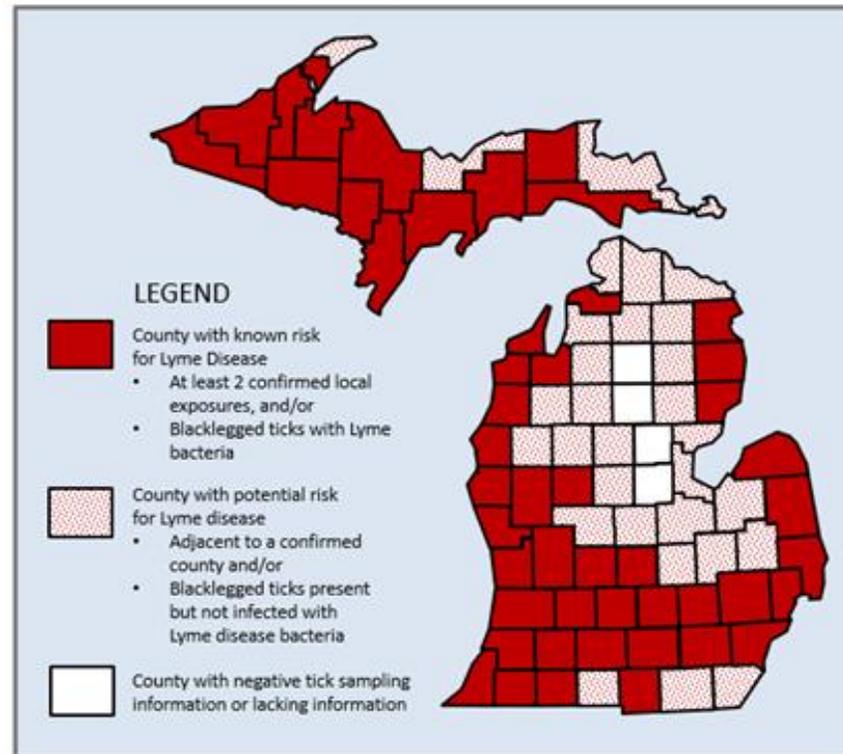


Ticks: Identify, Educate, Respond

Expansion of Michigan Lyme Disease Risk: 2002-2010



2024 Michigan Lyme Disease Risk Map



BE AWARE

TICKS MAY BE FOUND IN THIS AREA



To avoid tick bites:

Wear light colored clothing so ticks can be spotted easily

Apply repellent to exposed skin and clothing

Check clothing & skin frequently for ticks

Shower soon after being outdoors

Carefully remove attached ticks immediately

Actual Size
 ■ Nymph: June through August
 ■ Adult: March through May and September through November
 Actual size varies between 1/16 inch and 1/8 inch

Stay on designated trails

SOME TICKS CAN TRANSMIT DISEASES

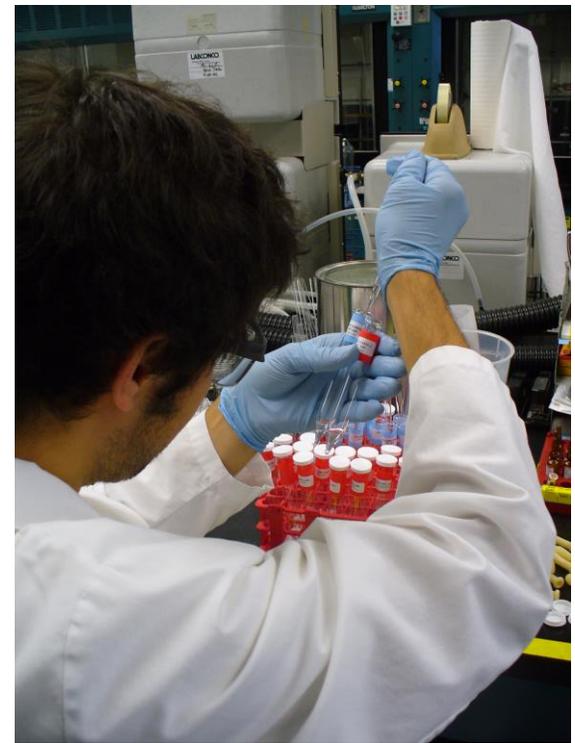
If you become ill with symptoms of fever, rash, body-aches, or fatigue within two to three weeks of your visit to a tick infested area, seek medical attention.

For more information or questions about tick identification and testing services, visit or contact your local health department, or visit www.michigan.gov/lyme

Developed and approved by the Michigan Department of Health & Human Services, May 2015.

Investigating and Preventing PFAS Exposures

MDHHS collects, analyzes and evaluates thousands of data points each year with the **goal of identifying and preventing ongoing human exposures to PFAS.**



Improving Maternal Outcomes

- More than 80% of maternal deaths are preventable.
 - Cardiac conditions.
 - Hemorrhage.
 - Hypertension.



Improving Maternal and Infant Health

- Annual survey of new mothers.
- Information to help improve health of Michigan mothers, babies and families:
 - Breastfeeding.
 - Oral health.





Nativity Data for Michigan House Districts, 2020-2022

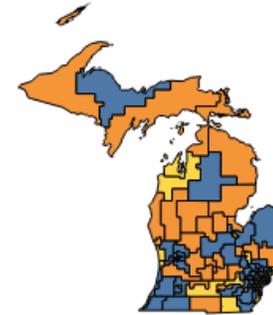


Filters & Download Options

Details

Preterm birth is one of the main drivers of infant mortality. Various strategies that focus on decreasing Michigan's preterm birth percentage are included within Michigan's Advancing Healthy Births, An Equity Plan for Michigan Families. For further natality statistics, see Michigan Natality Statistic. For more information about maternal and infant health in Michigan, see Maternal and Infant Health Website. Preterm birth is expressed as the percentage of live births in which the infants were born prior to 37 completed weeks of gestation. Source: Michigan Resident Birth Files, Division for Vital Records & Health Statistics,

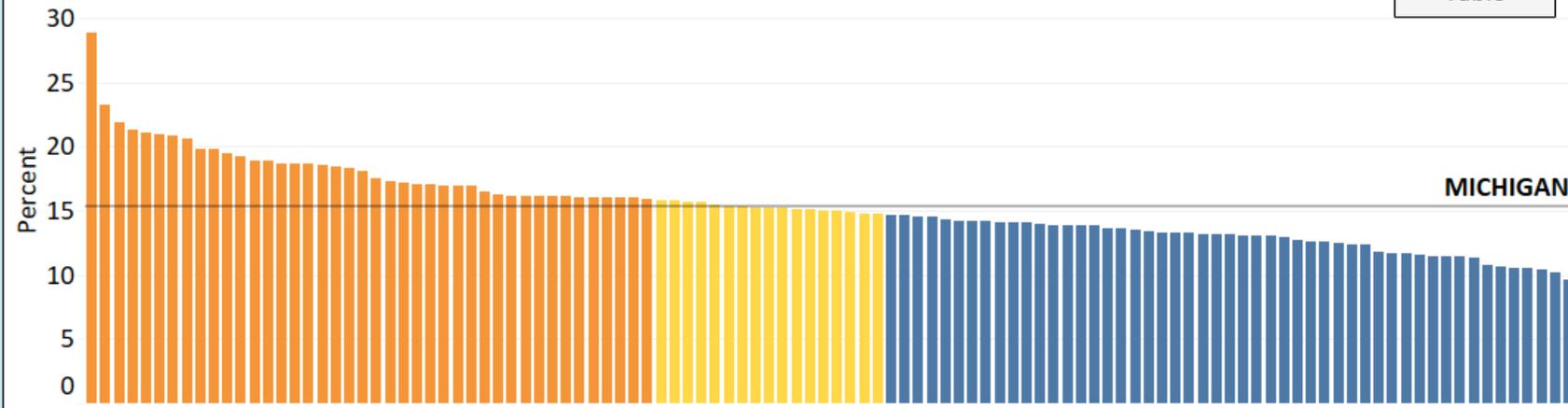
Percentage of Pregnancies that Resulted in a Preterm Birth, Michigan House Districts, 2022



- Better than MI Average
- About MI Average
- Worse than MI Average

Percentage of Pregnancies that Resulted in a Preterm Birth, Michigan House Districts, 2022

Table



Source: 2020-2022 Michigan Resident Birth File, Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services.



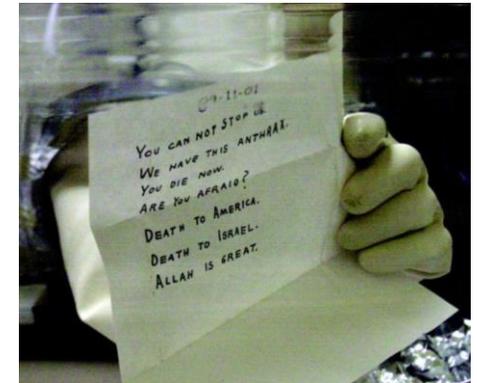
Thank you!

Bioterrorism and Emergency Management

What is Bioterrorism?

Bioterrorism involves intentionally releasing viruses, bacteria or toxins to harm people, livestock or crops (CDC, 2024).

- After the anthrax attacks of 2001, the federal government coordinated with U.S. states and territories to fund **bioterrorism preparedness** efforts.
- Preparedness efforts now include all-hazards preparedness such as Chemical, Biological, Radiological, Nuclear and Explosive (CBRNE), as well as mass casualty and active shooter events.

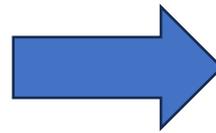


What is Bioterrorism?

Anthrax is used as a classic bioterrorism planning scenario.

Preparedness:

- Planning and Exercises.

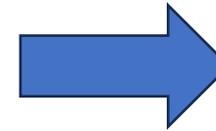


Event:

- Anthrax Release.

Detection:

- Clinical or Environmental.

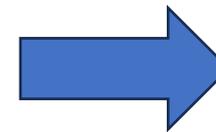


Response:

- Antibiotics and Antidotes.

Recovery:

- Community Recovery.
- Mitigation.



Preparedness:

- Planning and Exercises.

MDHHS Preparedness Funding

Two federal cooperative agreements support MDHHS, Local Health Departments and Healthcare Preparedness Programs

CDC Public Health Emergency Preparedness – \$17M

- State (i.e., preparedness staff, epidemiology, laboratory).
- 45 local health departments.
- 9 of 12 tribal partners actively participating.



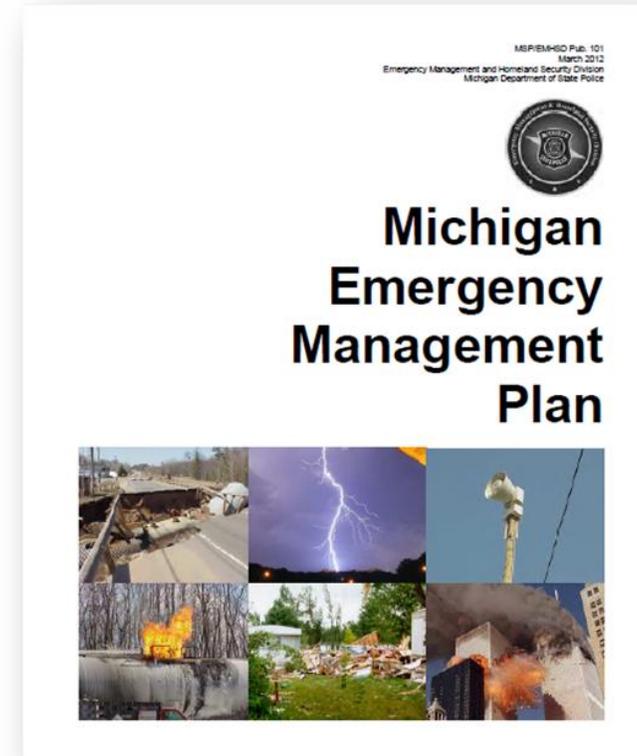
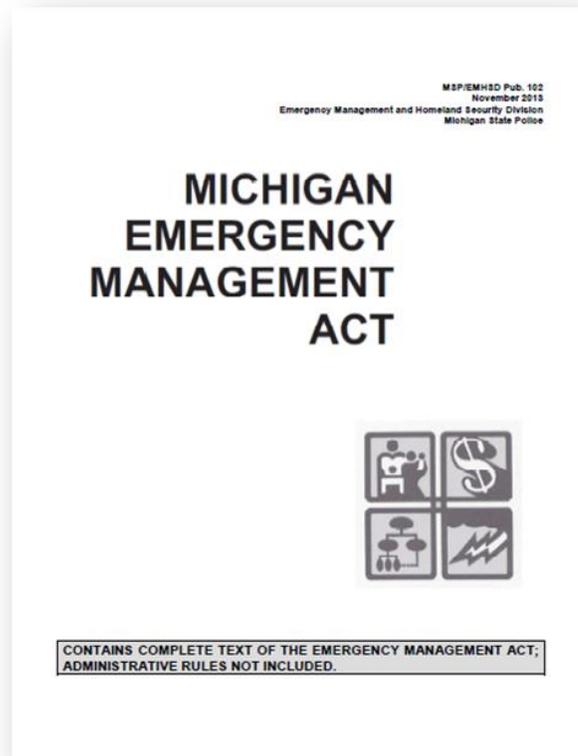
ASPR Hospital Preparedness Program – \$5.8M

- State (i.e., preparedness).
- Partners (e.g., health care coalitions, university partners).



Michigan's Emergency Management System and Partners

[Public Act 390 of 1976](#), as amended, also known as the Michigan Emergency Management Act.



MDHHS's Role - Coordination

Community Health Emergency Coordination Center (CHECC)

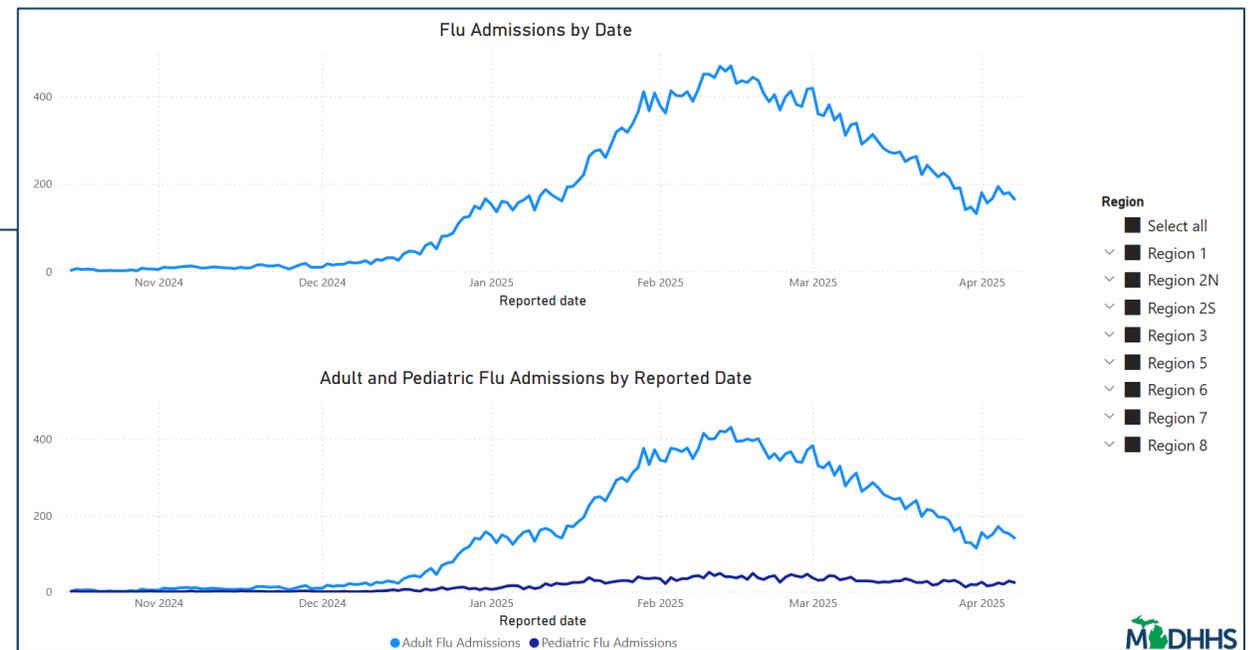
- Supports MDHHS emergency management coordinators in State Emergency Operations Center.
- MDHHS departmental (across administrations, bureaus and divisions).
- Regional Health Care Coalitions (i.e., medical/health care).
- Local health departments through the emergency preparedness coordinator.



MDHHS's Role – EPI and Lab

EMResource

Hospital bed availability.



Disease-specific admission trends.

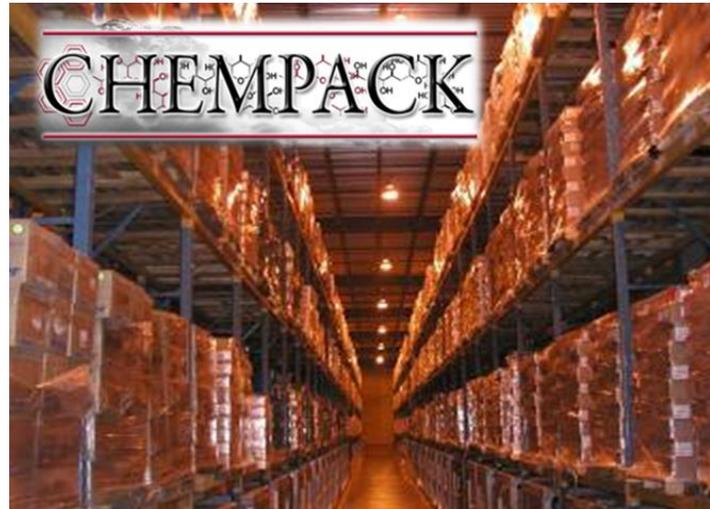
MDHHS's Role - Response

Emergency Medical Countermeasures

Strategic National
Stockpile.

MEDDRUN.
CHEMPACK.

PPE.
Ventilators.
Cardiac Monitors.



MDHHS's Role - Exercises

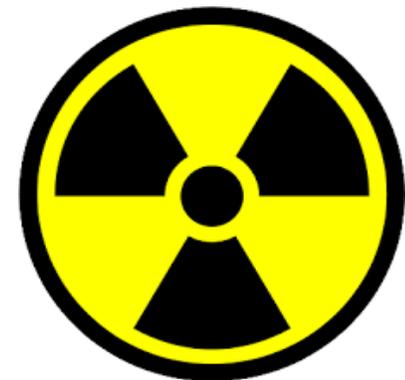
Recent exercises in March 2025:

Cold Weather MIMORT – Marquette.

- Mass fatality exercise.

Cobalt Magnet 2025 – Michigan.

- Nuclear power plant release.
- Federally sponsored Department of Energy exercise.



Questions & Discussion

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Thank you!