

Report to the Boards of Health

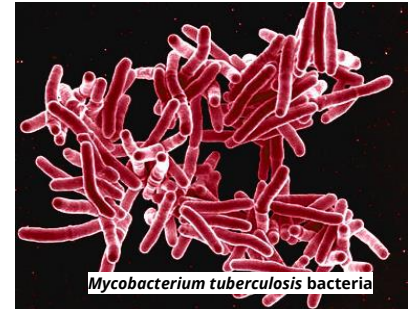
Jennifer Morse, MD, MPH, FAAFP, Medical Director

Mid-Michigan District Health Department, Wednesday, October 26, 2022
Central Michigan District Health Department, Wednesday, October 26, 2022
District Health Department 10, Friday, October 28, 2022



Tuberculosis

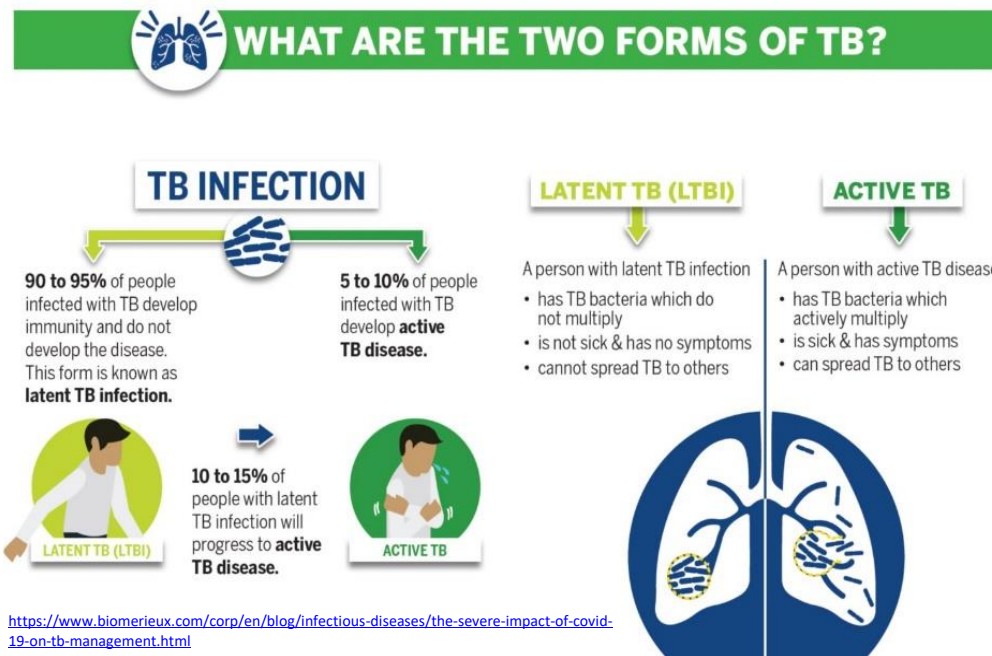
Tuberculosis (TB) is caused by a type of bacteria called *Mycobacterium tuberculosis*. This bacterium was discovered in 1882 by Dr. Robert Koch, at a time when TB killed about one out of every seven people living in the US and Europe. It is estimated *M. tuberculosis* has been around as long as 3 million years and illness from TB has described by many ancient civilizations. There are many other types of mycobacterium bacteria, some that can cause illness in humans and animals.



TB most commonly affects the lungs, though can affect other areas of the body. TB is spread through the air from a person ill with active TB disease in their lungs. The bacteria are contained in small airborne droplets created by coughing, sneezing, speaking, or singing. People that may have been exposed to these droplets, typically someone who spends a lot of time with the person with active TB like a family member or friend, is called a “contact”. Contacts are at risk for getting infected with TB but usually do not develop active TB disease right away. Most of the time, a person’s immune system can control the bacteria and contain it within the body. The bacteria become “latent” or inactive but are not dead. The person is said to have latent TB infection (LTBI). They are not ill and cannot spread TB to others. If LTBI is treated, active TB disease can be prevented. It is estimated that one out of four people (25%) worldwide have LTBI. The CDC estimates that around 5% of the US population, or up to 13 million people in the US, have LTBI. More than 80% of active TB cases

in the United States result from longstanding, untreated latent TB infection.

If LTBI is not treated, it can reactivate and become active TB disease. This will happen to about 5% to 10% of people with LTBI, and the risk is higher in people as they get older, if they have diabetes, a weakened immune system, poor nutrition, or kidney failure.



LTBI is diagnosed by tests that can recognize if our immune system has been exposure to TB and worked to fight the TB bacteria. Both a blood test and a skin test are available to test for TB infection. If either of these tests is positive, a healthcare professional needs to further evaluate the person and do more tests to determine if they have LTBI or active TB disease.

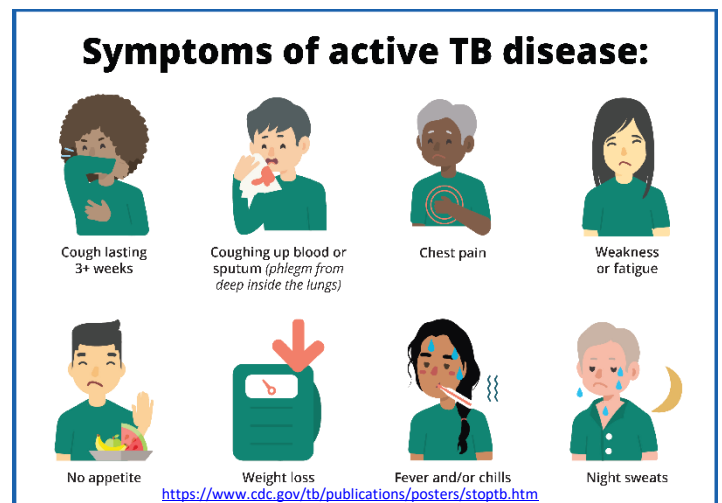
It is estimated that millions more people need to be tested and treated for LTBI in the US if we hope to eliminate TB. People at higher risk for being infected with TB bacteria or at higher risk of reactivation of infection should be testing, including:

- People who have spent time with someone with active TB infection at any time during their lifetime
- People who are from a country or stayed at least one month in a country where TB disease is common. This includes most countries other than the United States, Canada, Australia, New Zealand, or a country in western or northern Europe.
- People who (now or in the past) live or work in settings that are higher risk for exposure to TB. Examples include correctional facilities/jails, long-term care facilities or nursing homes, homeless shelters, and anyone who has used illegal drugs.
- People who have or will have a weakened immune system. This includes anyone who has:
 - HIV.
 - An organ transplantation.
 - Treatment with biologic disease-modifying antirheumatic drugs (bDMARDs). These medications are used for rheumatoid arthritis, ankylosing spondylitis, psoriasis, psoriatic arthritis, systemic lupus erythematosus (SLE), multiple sclerosis, and inflammatory bowel disease such as ulcerative colitis and Crohn's disease). A list of these medications can be found [here](#).
 - Treatment with high-dose and/or long-term corticosteroids, such as prednisone or methylprednisolone.
 - Cancer and receiving chemotherapy.
 - Any other immunosuppressive conditions or medication.

Once LTBI is diagnosed, it is treated with one or two antibiotics for 3 to 6 months. Treatment greatly reduces the risk of active TB disease developing later in life.

People with active TB disease are sick, can be contagious if it is in the lungs, and can die from their illness. The typical symptoms of active TB disease are feeling sick or weak, weight loss, fever, and night sweats. TB disease in the lungs typically causes a cough, chest pain, and coughing up blood. Symptoms of TB disease in other parts of the body depend on the area affected.

Active TB disease requires four antibiotics for the first couple of months, then two antibiotics for 4 to 7 months longer at a minimum. Because active TB can be spread to others through the air, public health is involved finding and testing contacts for TB infection. Those with active TB must stay in isolation until they are no longer contagious, which can be 2 weeks or over 2 months. It is very important all medication is taken as directed to be sure the TB is cured and doesn't become resistant to the antibiotics, so public health performs directly observed therapy (DOT). This requires a public health nurse or other public health advocate visiting the patient every day to watch the patient swallow their medication and make sure they are not having any side effects or other problems. Over the past several years, most DOT has been transitioning to eDOT/vDOT (electronic or video DOT). With this, the nurse and patient can use computers or cell phones to connect via video, enabling the nurse to watch the patient take their medication and discuss any problems.

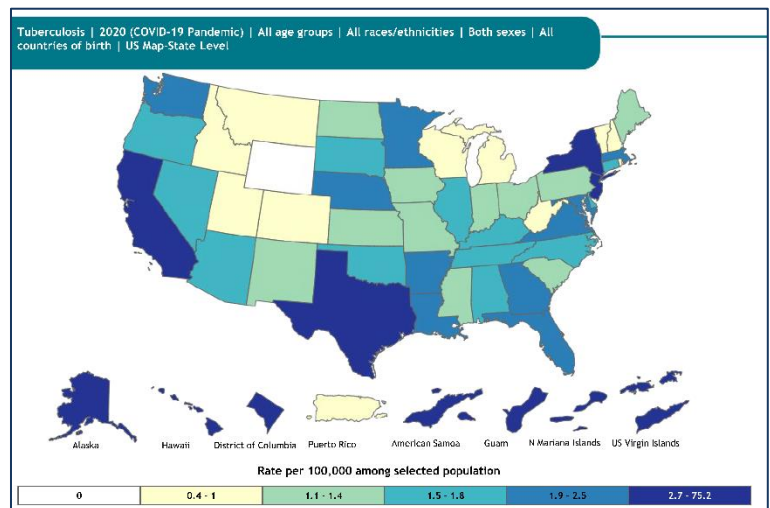
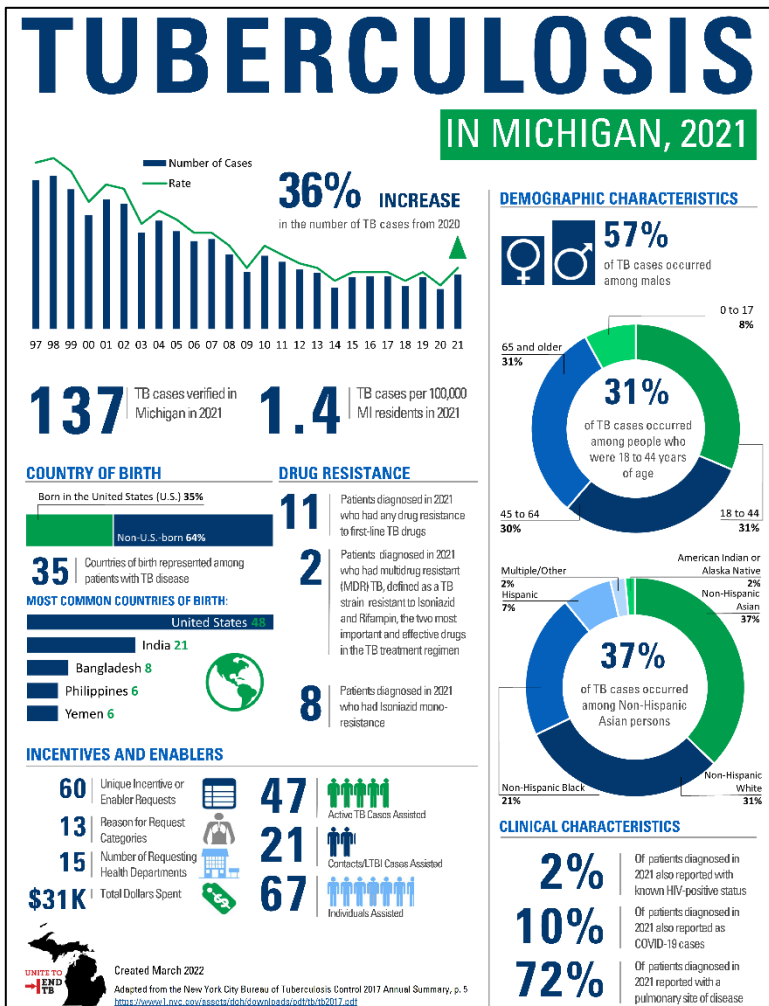


In Michigan, the local health departments (LHD) are responsible for tuberculosis prevention and control for their jurisdiction. This includes assisting with the cost of treatment as needed. Many LHD provide primary case management of LTBI and TB cases. Private healthcare providers can also diagnose and treat persons with TB and

LTBI, but they are required to report suspect or confirmed cases of active TB to the health department within 24 hours of diagnosis. LHD are ultimately responsible in assuring appropriate treatment and case management for patients with active TB disease, and healthcare providers are encouraged to consult frequently with their LHD when managing a case of suspected or confirmed TB disease. Michigan Department of Health and Human Services (MDHHS) gives healthcare providers access to clinicians experienced in tuberculosis to provide free consultation and answer questions.

The powers and duties of local health departments relating to tuberculosis control are covered in the Michigan Compiled Laws, Sections 333.2451, 333.5117, 333.5203, 333.5205, 333.5207 and 333.5301. Requirements for reporting suspected or confirmed cases of tuberculosis are described in 325.171 through 325.173 of the MDHHS Communicable Disease Rules. Every state possesses general public health legal authority that may be invoked to control communicable diseases, including tuberculosis.

Mathematical modeling using TB data from 2013–2017 estimated that about 1.3%, or 130,823 people, living in Michigan are infected with latent tuberculosis. Just over half, or 59% of these individuals, would have been born outside of the United States. This means about 41% of those with LTBI in Michigan are individuals born in the United States. The CDC estimates that 4 out of 5 active TB cases are due to longstanding, untreated LTBI. In regions of the country with low amounts of TB, like Michigan, active TB disease often takes months to be properly diagnosed. These active cases, that are ill for months and not properly diagnosed, can spread TB to many others. For all these reasons, it is important for healthcare providers and residents in Michigan know that TB is still a concern and to ensure they are tested if they are at risk for infection, especially if they have symptoms of active TB.



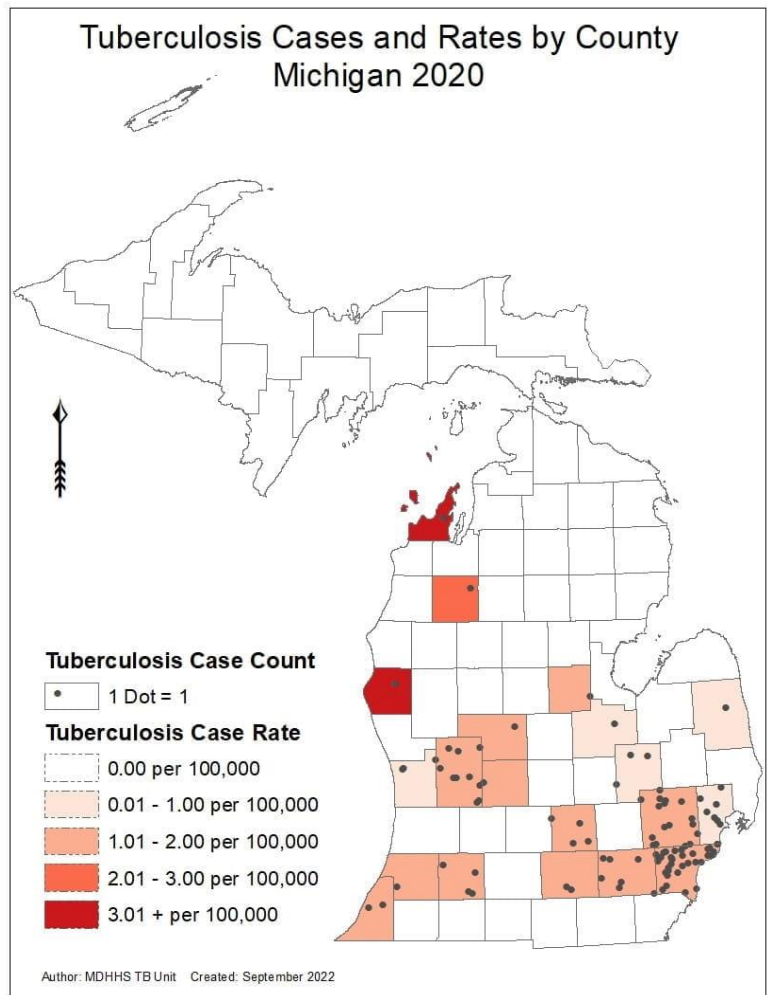
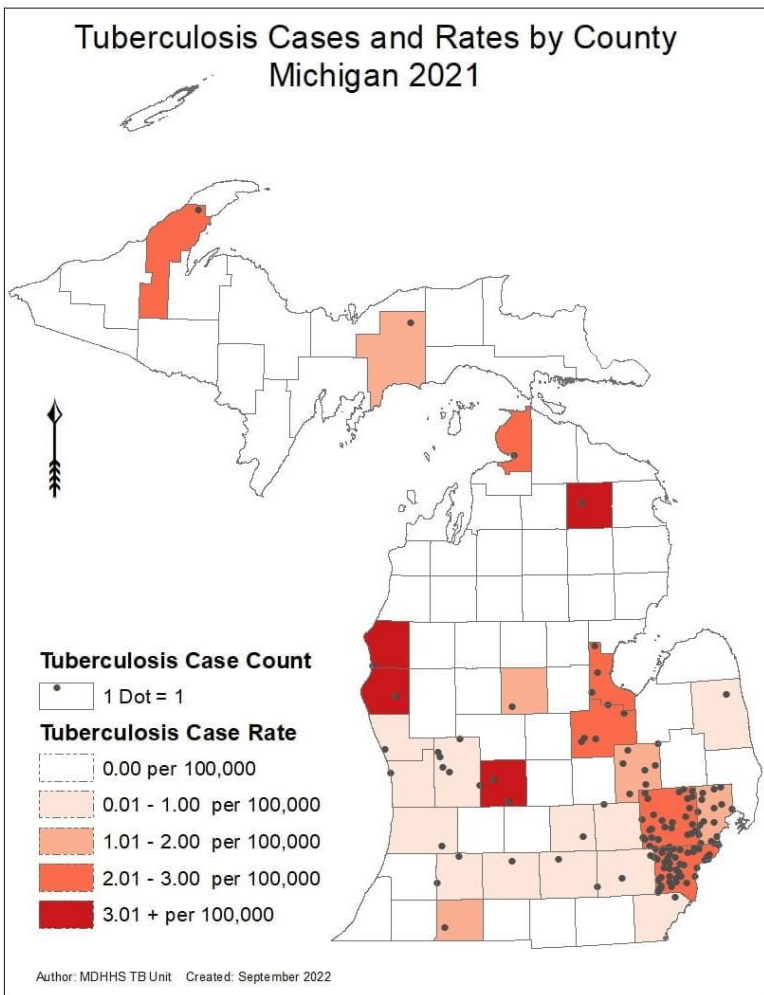
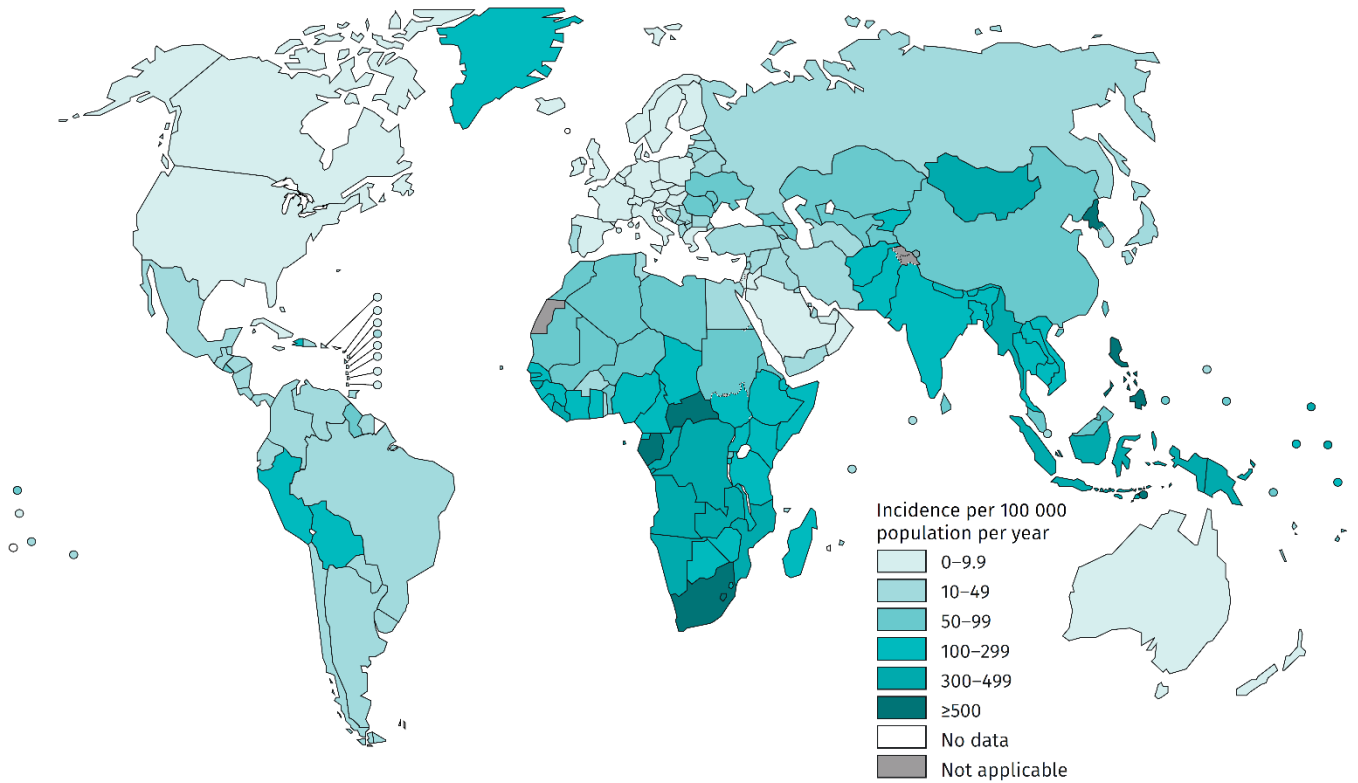
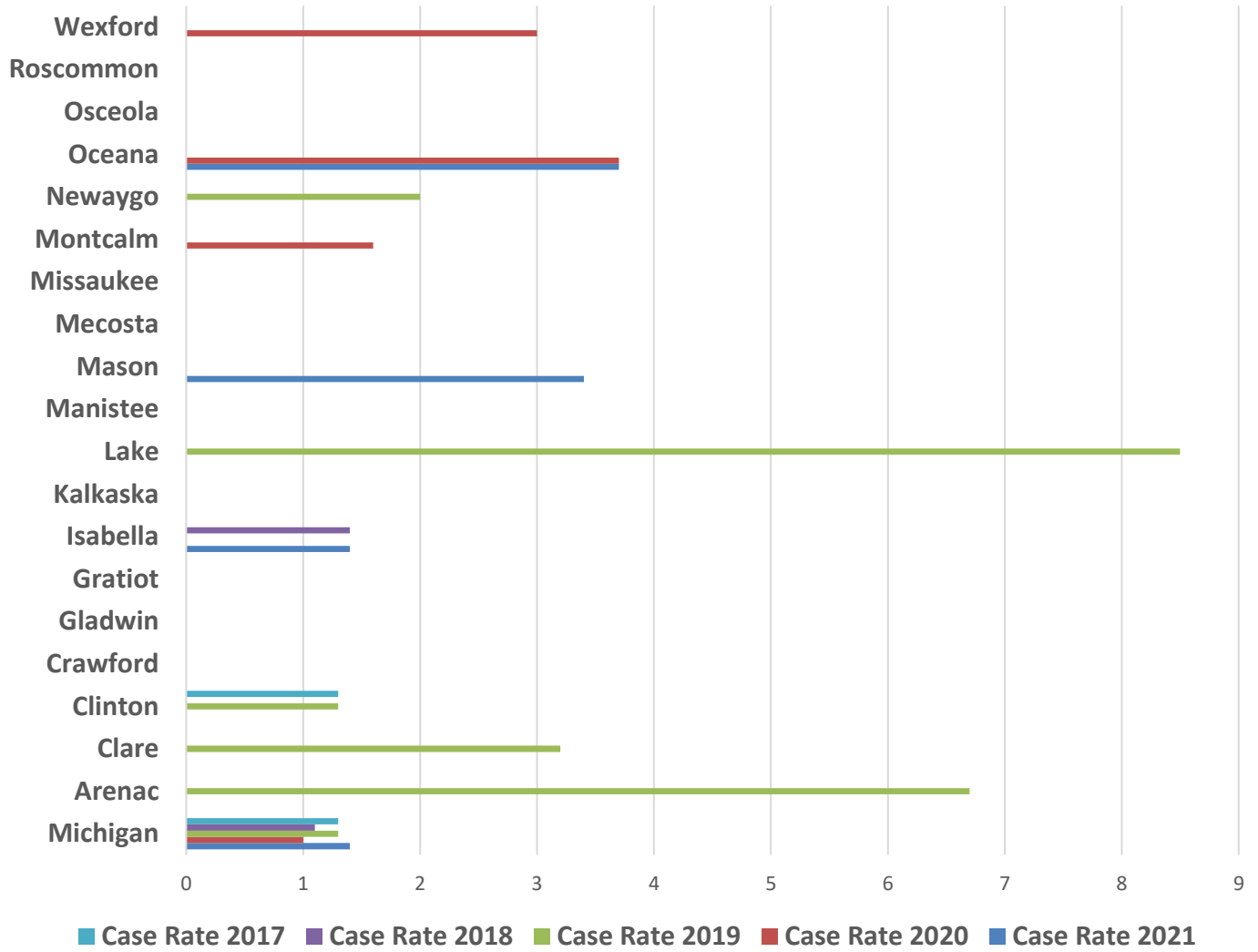


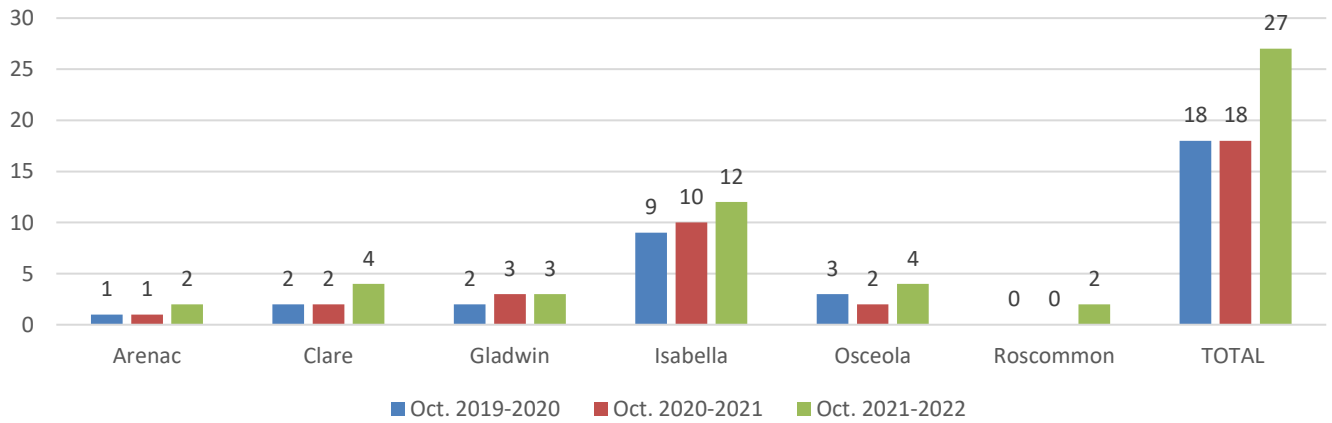
FIG. 13
Estimated TB incidence rates, 2020



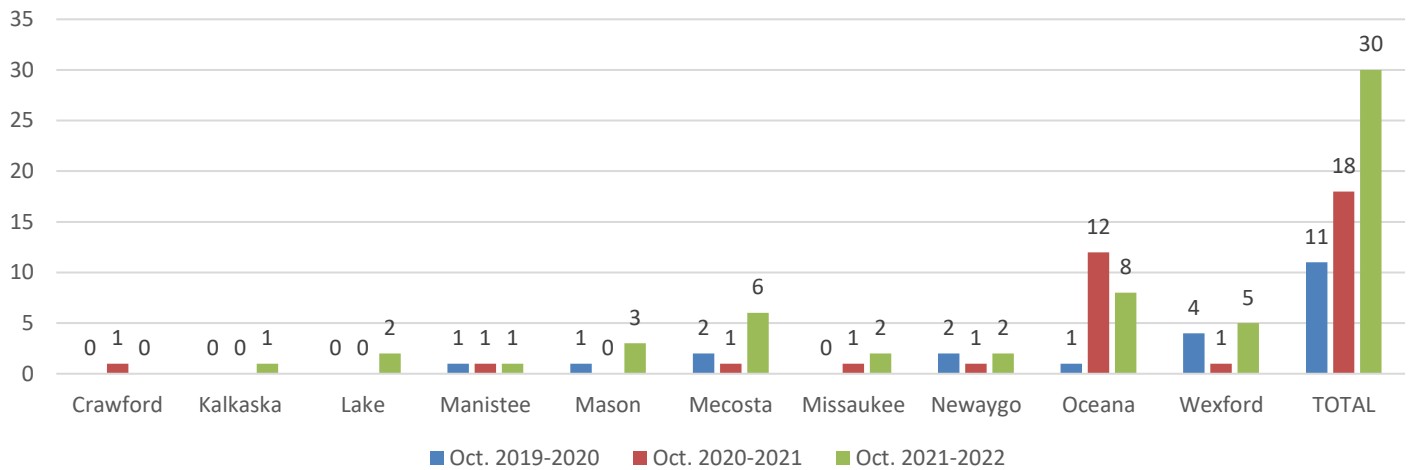
TB Case Rates, 2017-2021



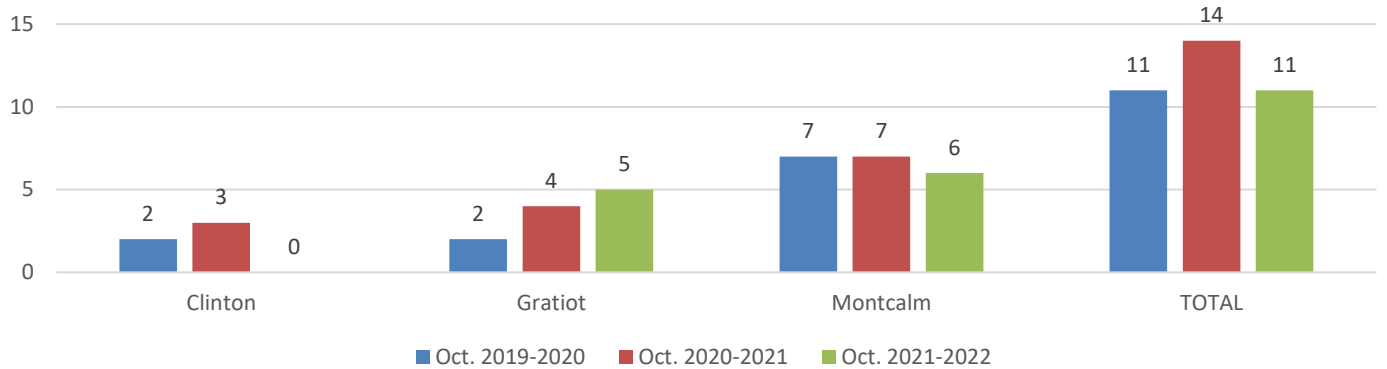
Number of LTBI Cases Reported to CMDHD



Number of LTBI Cases Reported to DHD10

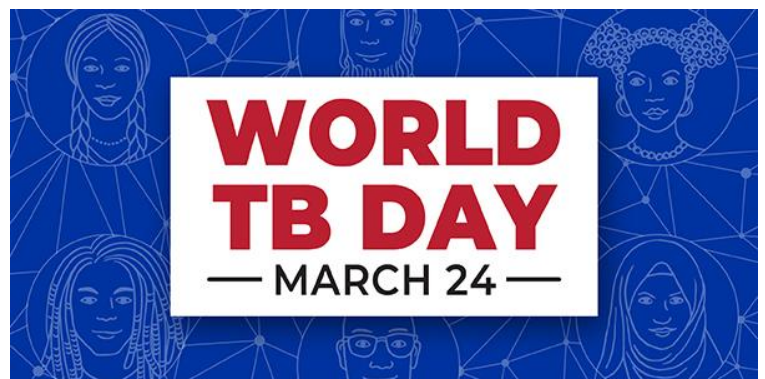


Number of LTBI Cases Reported to MMDHD



If you are interested in learning more about TB or being more involved in the elimination of TB:

- [‘No respecter of persons’ – Michigan’s fight against tuberculosis](#)
- The Forgotten Plague: TUBERCULOSIS IN AMERICA
<https://www.pbs.org/wgbh/americanexperience/films/plague/>
- <https://www.stoptb.org/>
- <https://www.stoptbusa.org/>
- <https://www.wearerb.com/>
- <https://tbeliminationalliance.org/>
- [American Lung Association](#)
- <https://www.louderthantb.org/coughitup>
- The [Collaboration for TB Vaccine Discovery \(CTVD\)](#)
- <https://www.usaid.gov/global-health/health-areas/tuberculosis>



Recommendations:

1. Get screened for TB infection if have a high-risk factor (listed above) and have not been screened in the past.
2. Support domestic and international efforts to eliminated tuberculosis.
3. Refer those with concerns or questions about tuberculosis to their local health department.

Sources

- Up To Date
- CDC. Tuberculosis History.
[https://www.cdc.gov/tb/worldtbdays/history.htm#:~:text=TB%20in%20humans%20can%20be,China%20\(2%2C300%20years%20ago\).](https://www.cdc.gov/tb/worldtbdays/history.htm#:~:text=TB%20in%20humans%20can%20be,China%20(2%2C300%20years%20ago).)
- CDC. Latent TB Infection in the United States – Published Estimates.
<https://www.cdc.gov/tb/statistics/ltbi.htm#:~:text=Based%20on%20NHANES%20data%2C%20CDC,States%20have%20latent%20TB%20infection.>
- Marks, Suzanne M., et al. "Estimates of testing for latent tuberculosis infection and cost, United States, 2013." Public Health Reports 134.5 (2019): 522-527.
- Centers for Disease Control and Prevention. Progressing toward tuberculosis elimination in low-incidence areas of the United States: recommendations of the Advisory Council for the Elimination of Tuberculosis. MMWR 2002;51(No. RR-5)
- MDCH. 2009. Michigan Tuberculosis Program Manual.
- Centers for Disease Control and Prevention. "Tuberculosis control laws and policies: A handbook for public health and legal practitioners." (2009).
<https://www.cdc.gov/tb/programs/tblawpolicyhandbook.pdf>
- Mirzazadeh A, Kahn JG, Haddad MB, Hill AN, Marks SM, Readhead A, Barry PM, Flood J, Mermin JH, Shete PB. State-level prevalence estimates of latent tuberculosis infection in the United States by medical risk factors, demographic characteristics and nativity. PLoS One. 2021 Apr 1;16(4):e0249012. doi: 10.1371/journal.pone.0249012. PMID: 33793612; PMCID: PMC8016318.
- <https://www.who.int/teams/global-tuberculosis-programme/tb-reports>
- <https://www.michigan.gov/mdhhs/keep-mi-healthy/communicablediseases/diseasesandimmunization/tb/statistics/michigan-tb-epidemiology>
- [NCHHSTP AtlasPlus](#). Accessed on 10/11/2022