

EPIDEMIOLOGY OF TUBERCULOSIS

GLOBAL, NATIONAL, AND LOCAL WITHIN INDIANA, MICHIGAN, AND OHIO

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DISCLOSURE

- I have no actual or potential conflicts of interest in relation to this presentation
- I have no financial relationships to disclose

LEARNING OBJECTIVES

- Describe the burden of active TB disease (TB) and Latent TB Infection (LTBI) in terms of susceptible groups
- Describe major factors that will affect future trends in TB

GLOBAL TB BURDEN

TB is one of the top 10 causes of death globally and the leading cause from a single infectious agent, ranking above HIV/AIDS

An estimated 10 million developed TB disease in 2017:

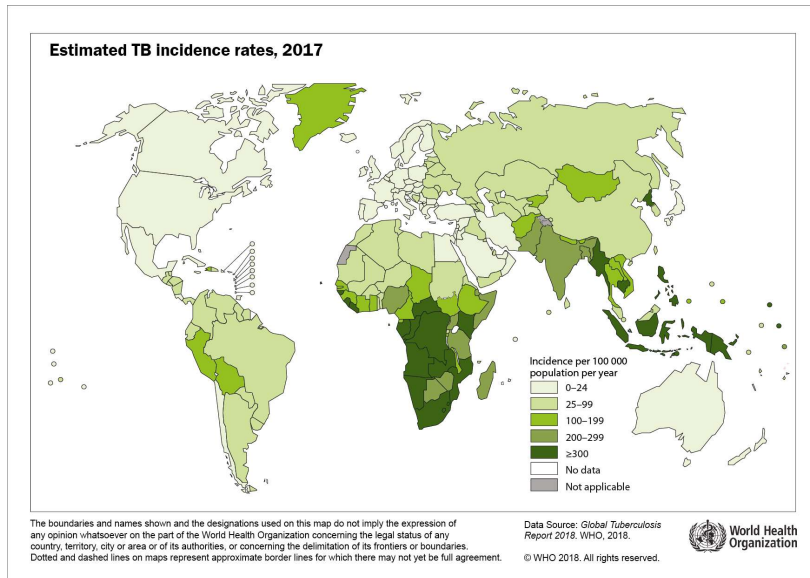
- 5.8 million men
- 3.2 million women
- 1.0 million children
- 9% people living with HIV
- Two-thirds in eight countries: India, China, Indonesia, the Philippines, Pakistan, Nigeria, Bangladesh, and South Africa

Almost 500,00 new MDR TB case were reported with 558,000 total cases resistant to at least rifampicin (RR-TB)

Almost half of new MDR/RR-TB cases reported from India, Philippines, and the Russian Federation

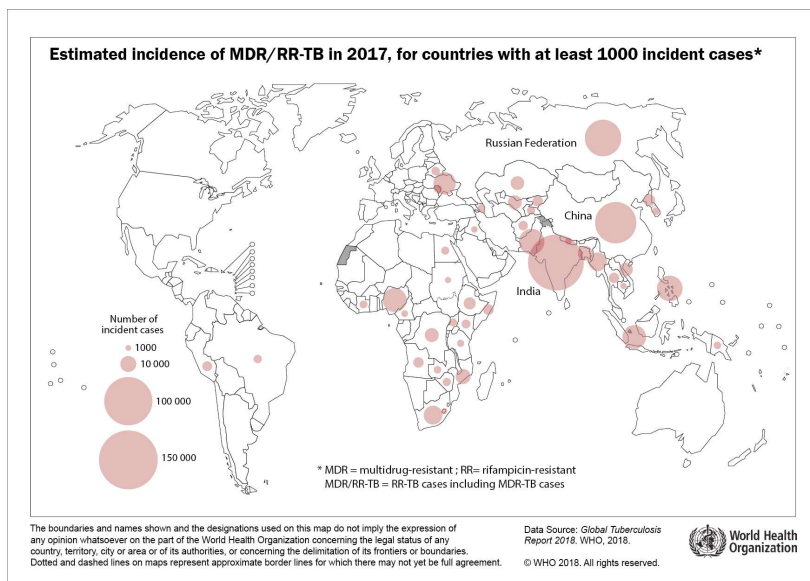
World Health Organization. Global tuberculosis report 2018. Geneva, Switzerland: World Health Organization; 2018. https://www.who.int/tb/publications/global_report/en/

GLOBAL TB BURDEN



http://gamapserver.who.int/mapLibrary/Files/Maps/Global_TB_incidence_2017.png

GLOBAL MDR TB BURDEN



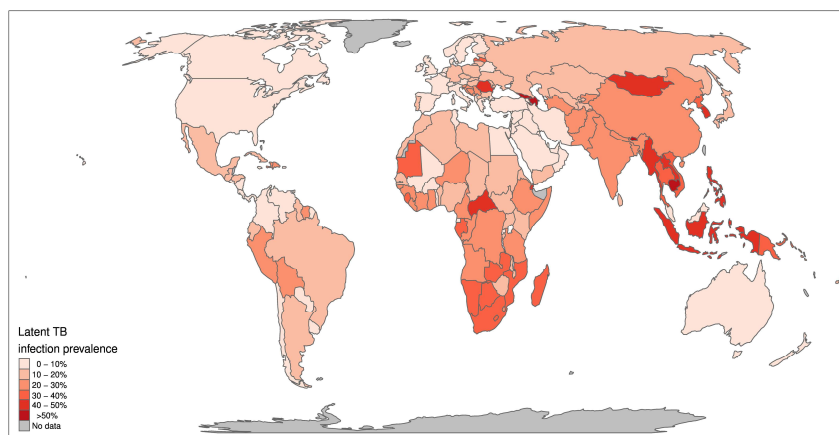
http://gamapserver.who.int/mapLibrary/Files/Maps/Global_TBincidence_mdr_rr_1000_2017.png

GLOBAL LTBI BURDEN

The 2014 estimate of LTBI burden was approximated at 1.7 billion people...just under a quarter of the population

Houben RM, Dodd PJ. The Global Burden of Latent Tuberculosis Infection: A Re-estimation Using Mathematical Modelling. [PLoS Med.](#) 2016 Oct 25;13(10):e1002152. doi: 10.1371/journal.pmed.1002152. eCollection 2016 Oct.

GLOBAL LTBI BURDEN



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NATIONAL TB BURDEN

9,029 TB cases reported in 2018 at a rate of 2.8 per 100,000

0.7% decrease in cases counted from 2017

Incidence rate decreased 1.3% from 2017

Lowest rate ever reported

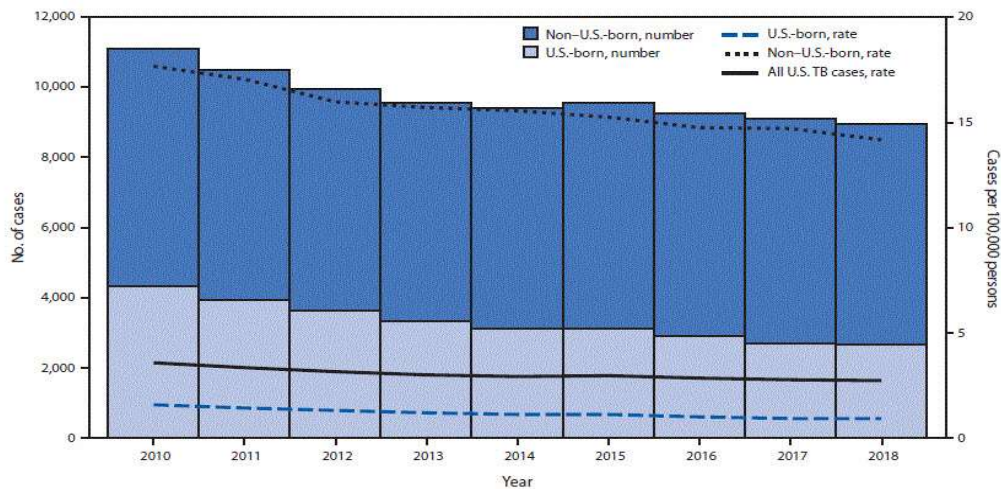
Persons born outside the U.S. accounted for approximately two thirds of cases with >14 times the rate among U.S.-born persons

Among persons born outside the U.S. incidence was highest among Asians

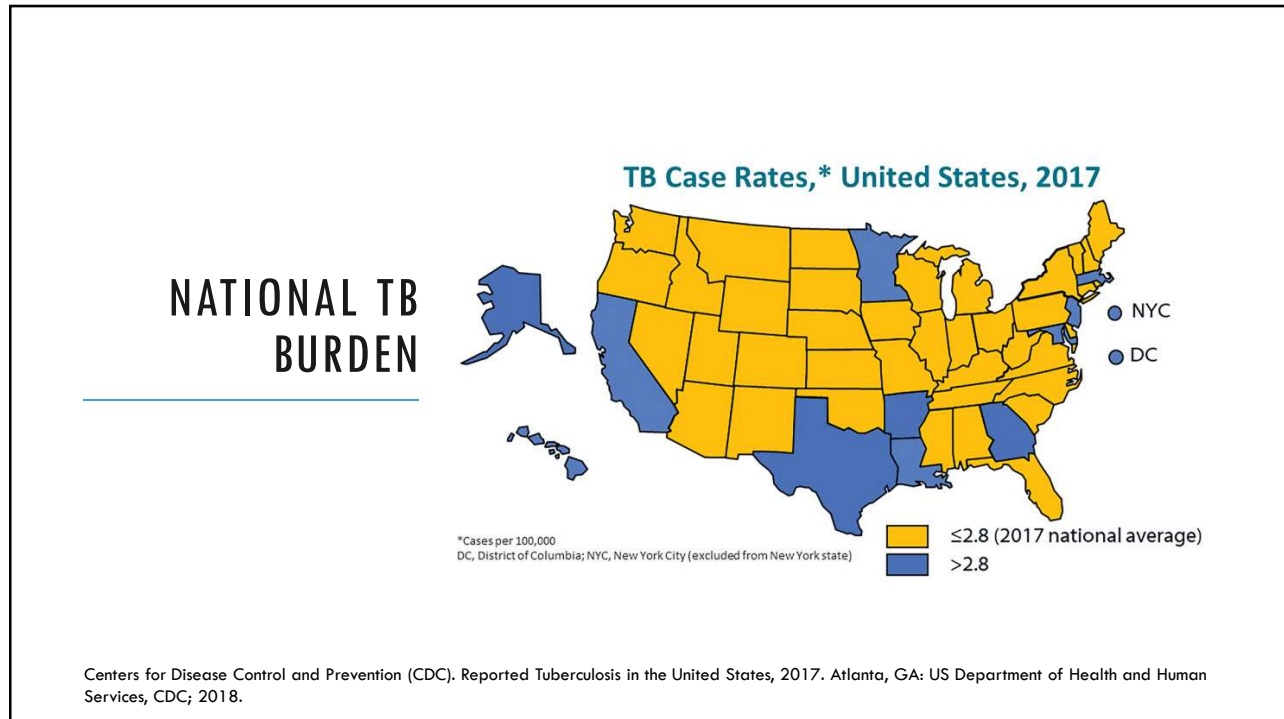
Among U.S. born persons incidence was highest among Native Hawaiians/Pacific Islanders

Talwar A, Tsang CA, Price SF, et al. Tuberculosis — United States, 2018. MMWR Morb Mortal Wkly Rep 2019;68:257–262.
DOI: <http://dx.doi.org/10.15585/mmwr.mm6811a2>.

TB BURDEN BY NATIONAL ORIGIN, 2010-2018



Talwar A, Tsang CA, Price SF, et al. Tuberculosis — United States, 2018. MMWR Morb Mortal Wkly Rep 2019;68:257–262.
DOI: <http://dx.doi.org/10.15585/mmwr.mm6811a2External>.



NATIONAL LTBI BURDEN

The 2011-2012 estimate of LTBI burden was approximated at 13 million people...just under five percent of the population

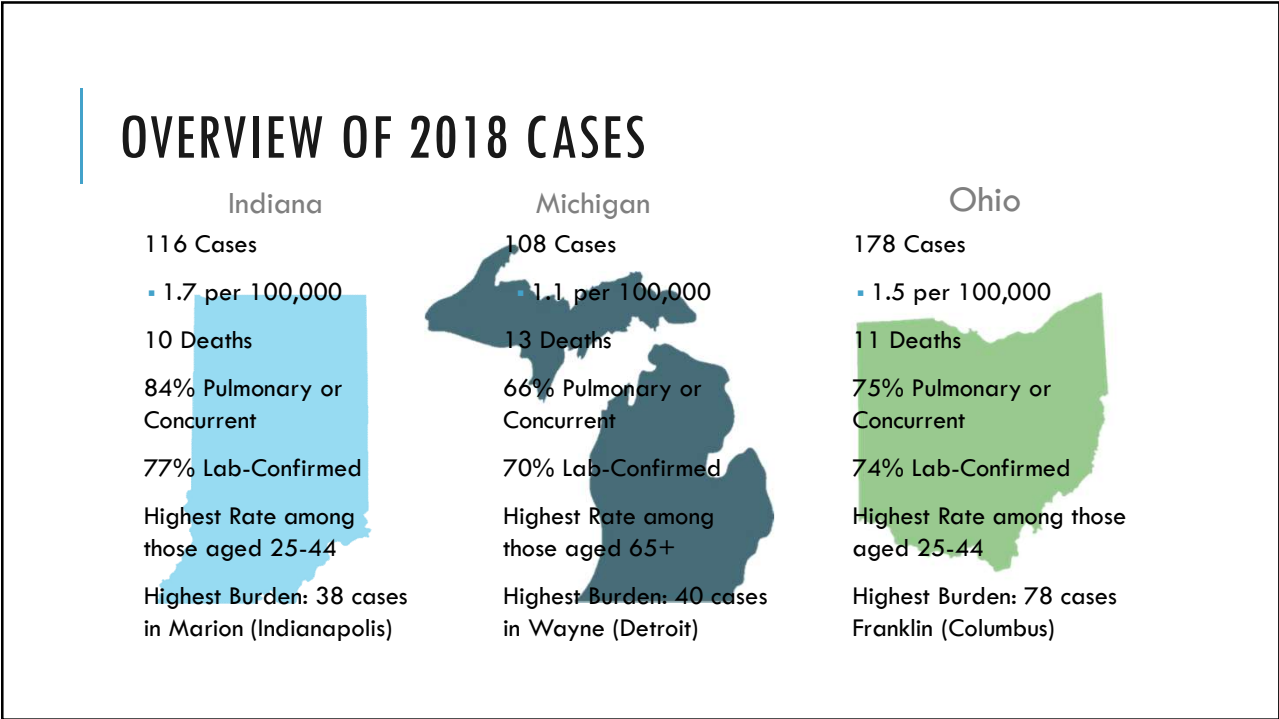
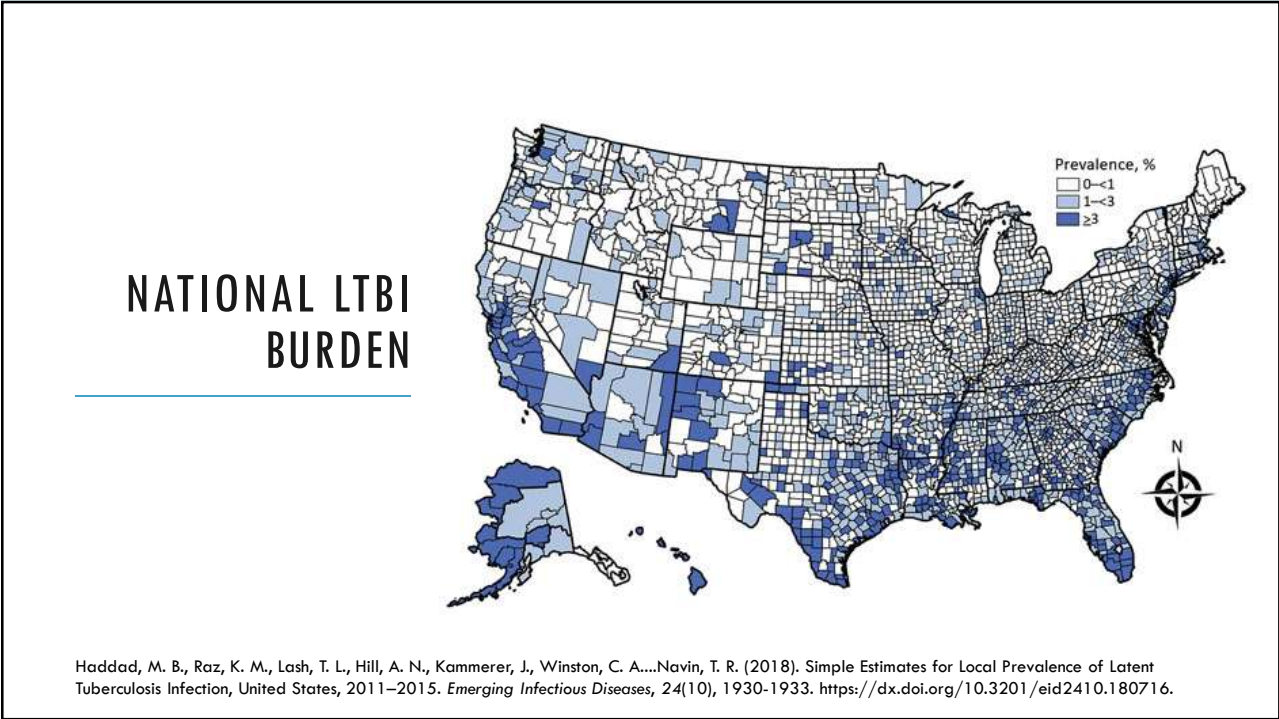
Highest prevalence groups are

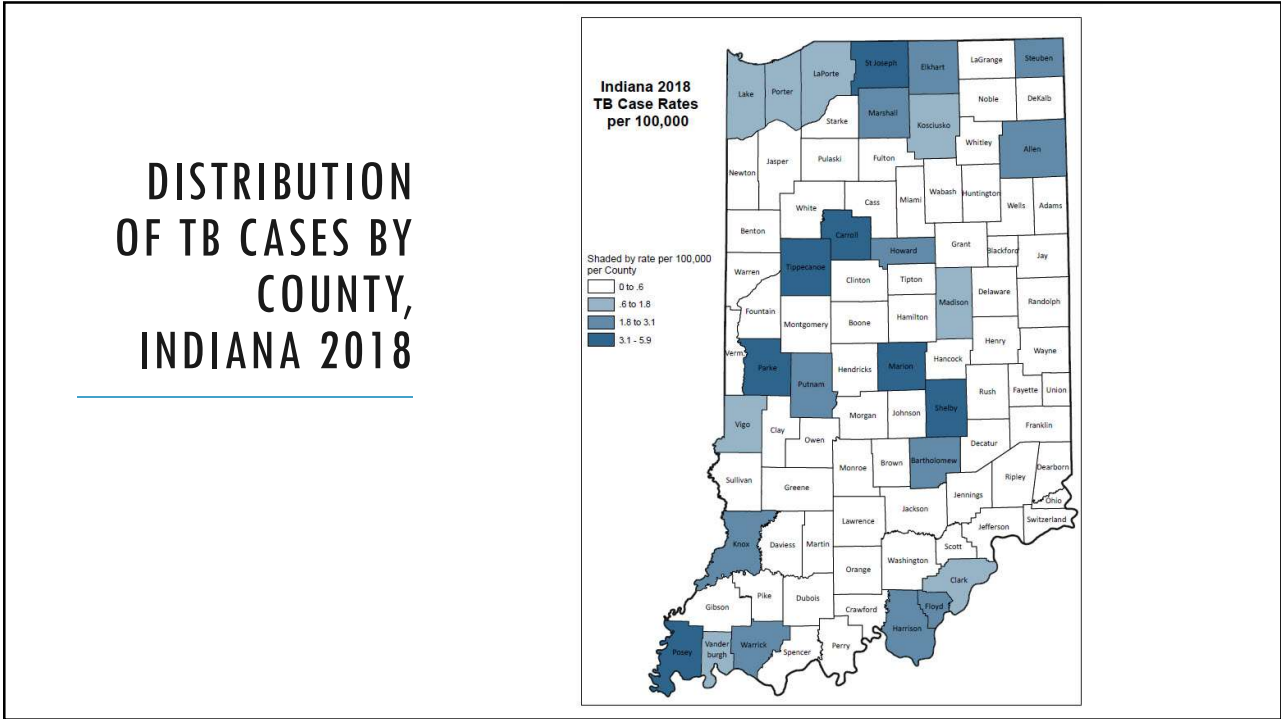
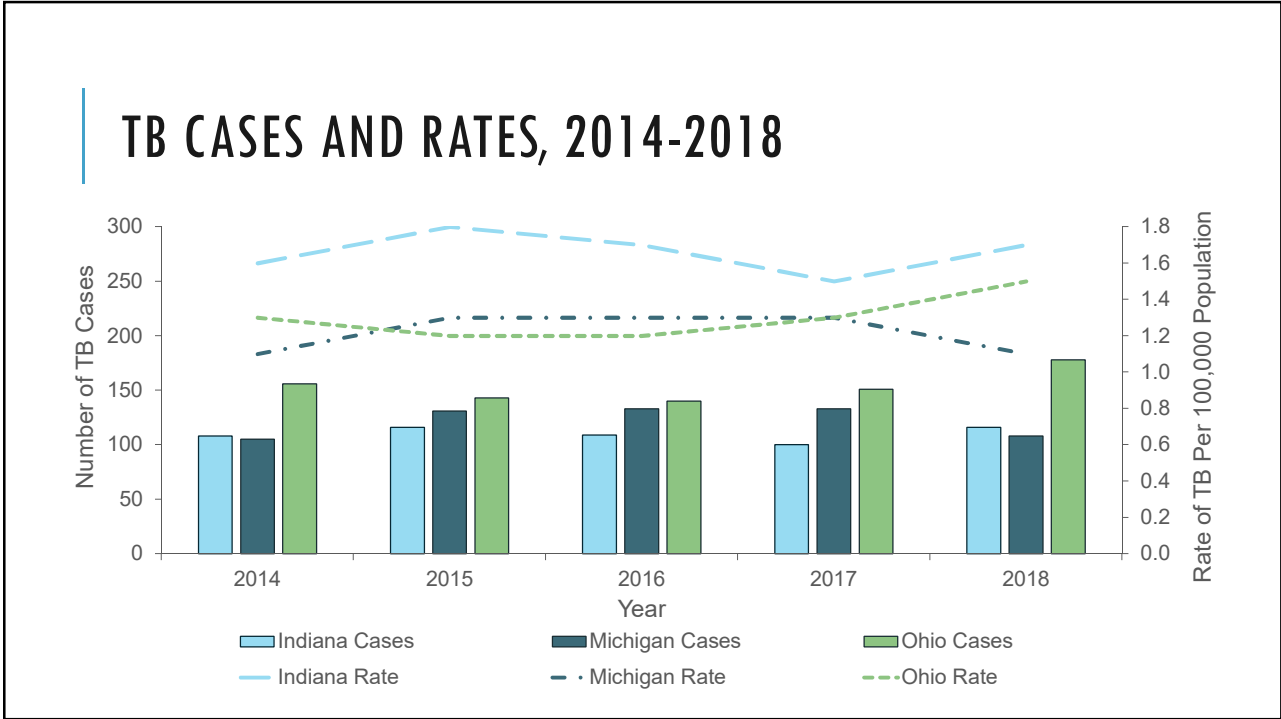
- Those aged 45-64 at 6%
- Non-Hispanic Asians at 22%
- Hispanics at 12%
- Persons Born Outside the U.S. at 21%

5% IGRA positivity among Civilian Noninstitutionalized U.S. population aged 6 years or older...over 14 million

- 2.8% among U.S.-born persons
- 15.9% among persons born outside the U.S

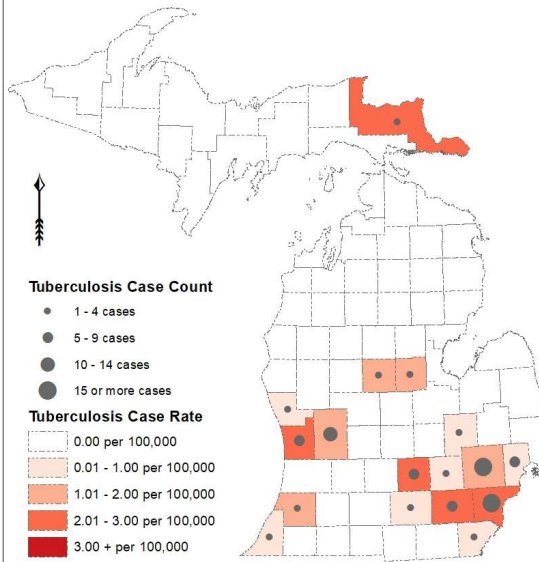
Miramontes R, Hill AN, Yelk Woodruff RS, Lambert LA, Navin TR, et al. (2015) Tuberculosis Infection in the United States: Prevalence Estimates from the National Health and Nutrition Examination Survey, 2011-2012. PLOS ONE 10(11): e0140881. <https://doi.org/10.1371/journal.pone.0140881>





DISTRIBUTION OF TB CASES BY COUNTY, MICHIGAN 2018

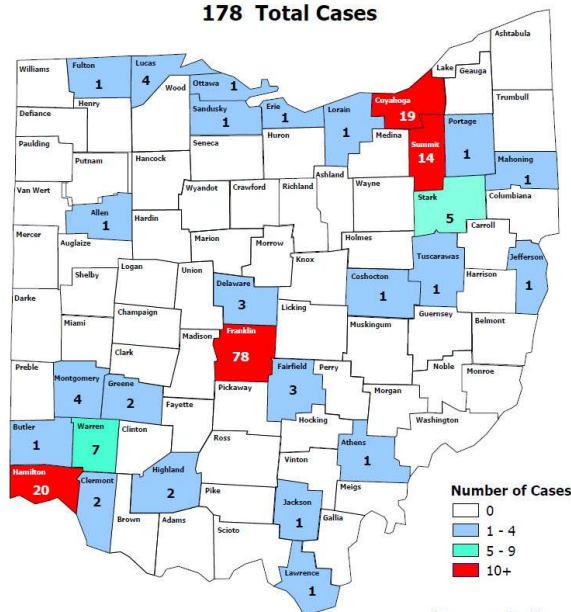
Tuberculosis Cases and Rates by County Michigan 2018



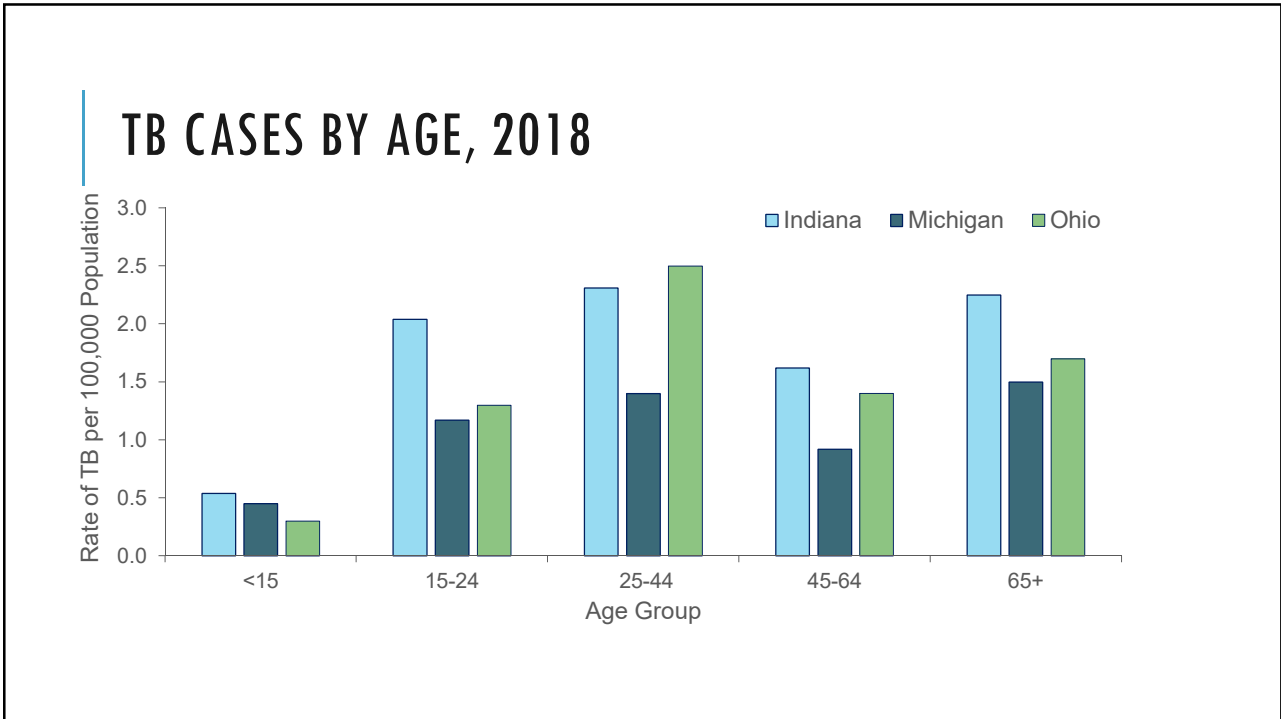
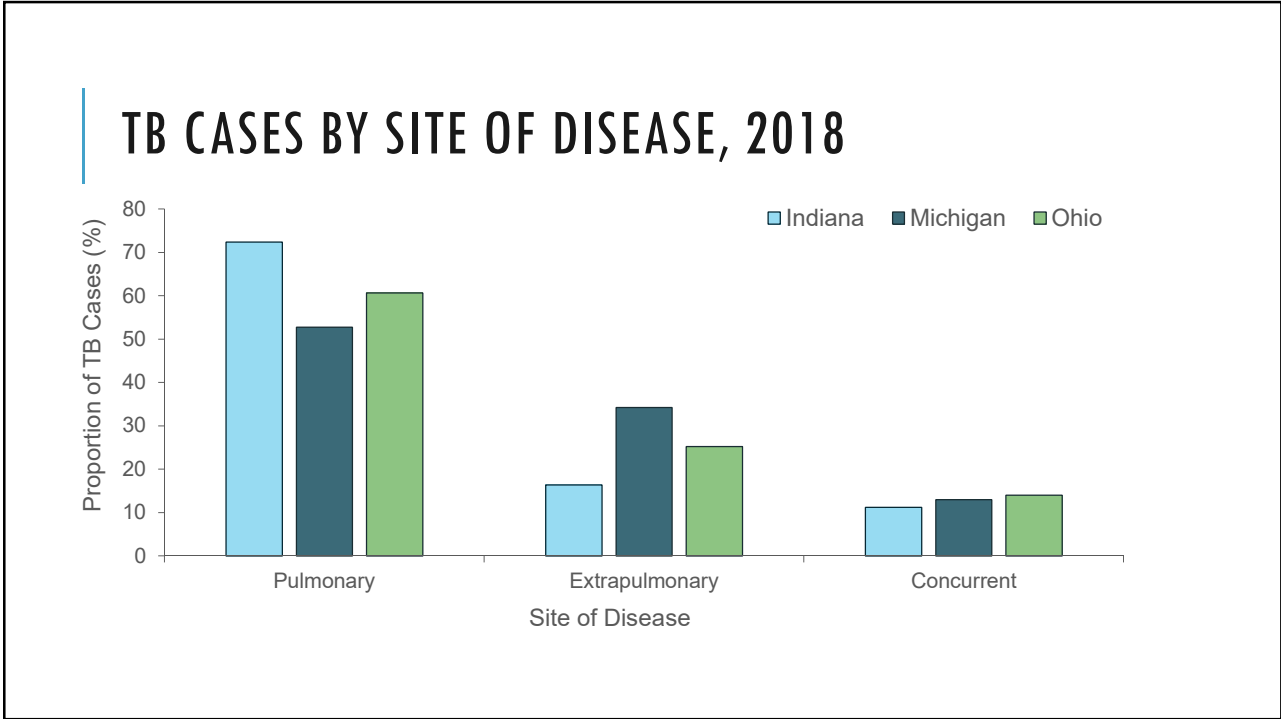
Author: MDHHS TB Unit Created: July 2019

DISTRIBUTION OF TB CASES BY COUNTY, OHIO 2018

Ohio by County for 2018
178 Total Cases



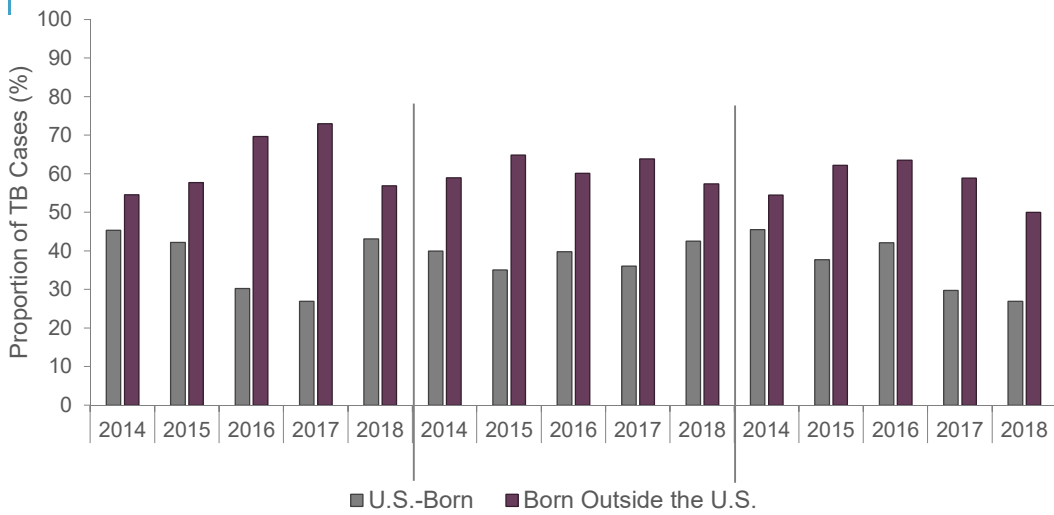
Ohio Department of Health
TB Registry, March 4, 2019



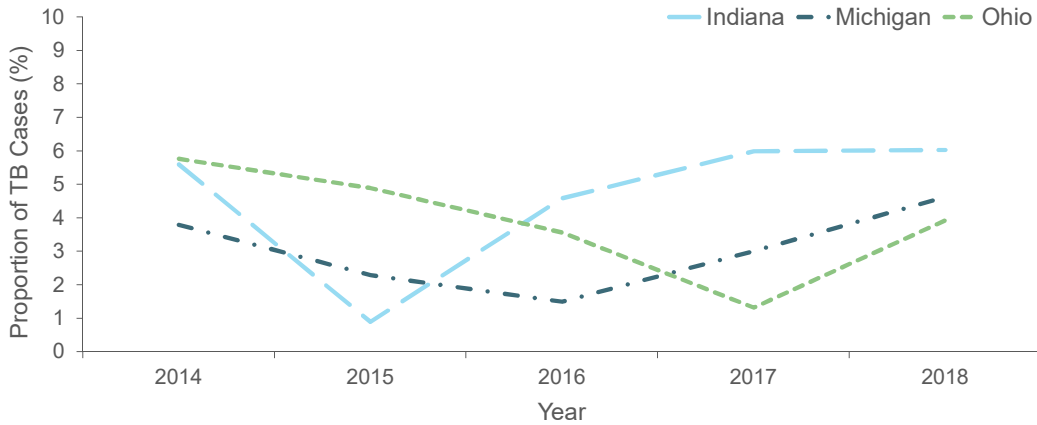
TB CASES BY RACE OR ETHNICITY, 2018



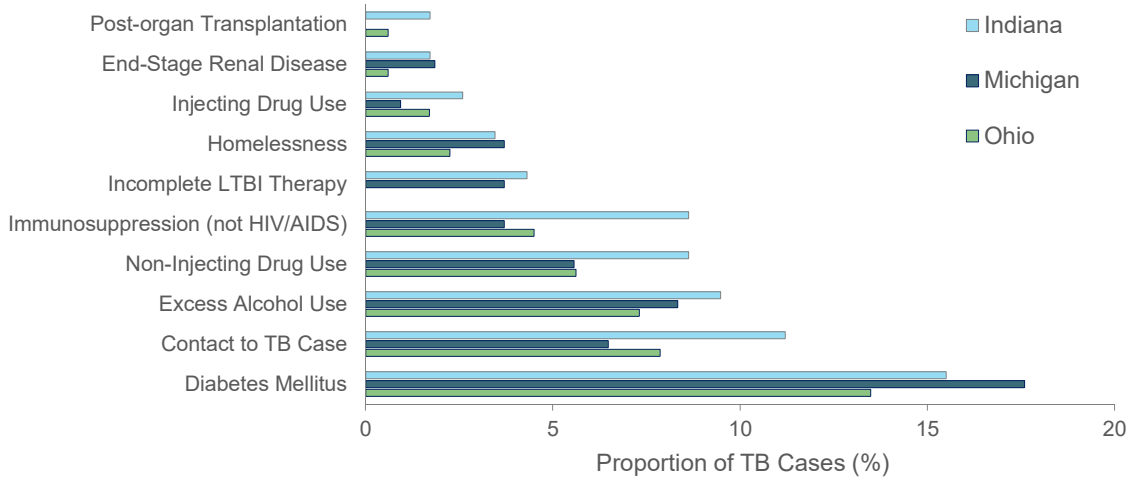
TB CASES BY NATIONAL ORIGIN, 2014-2018



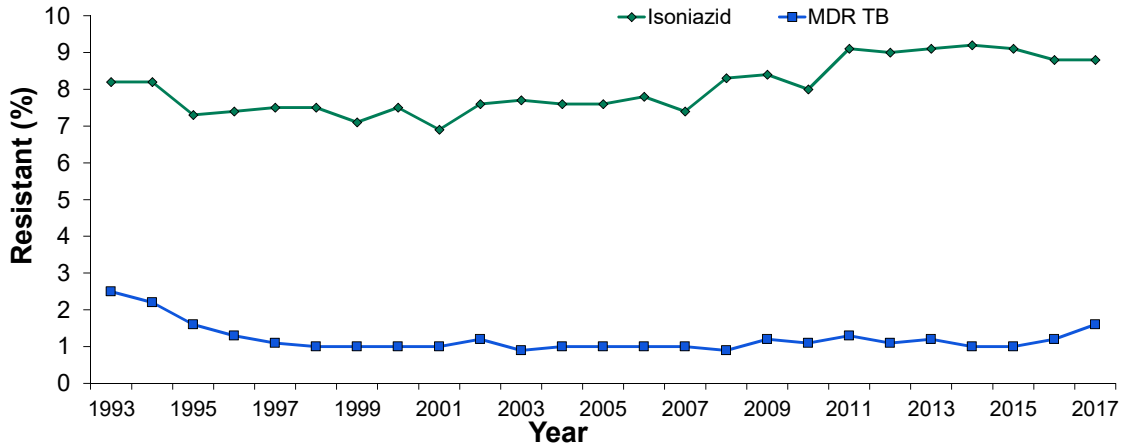
TB CASES WITH HIV CO-INFECTION, 2014-2018



ADDITIONAL RISK FACTORS AMONG TB CASES, 2018

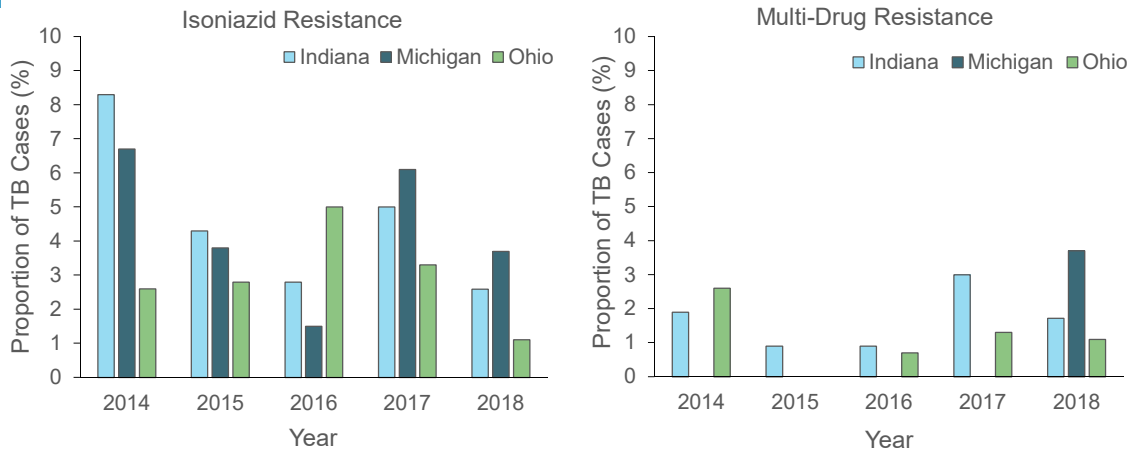


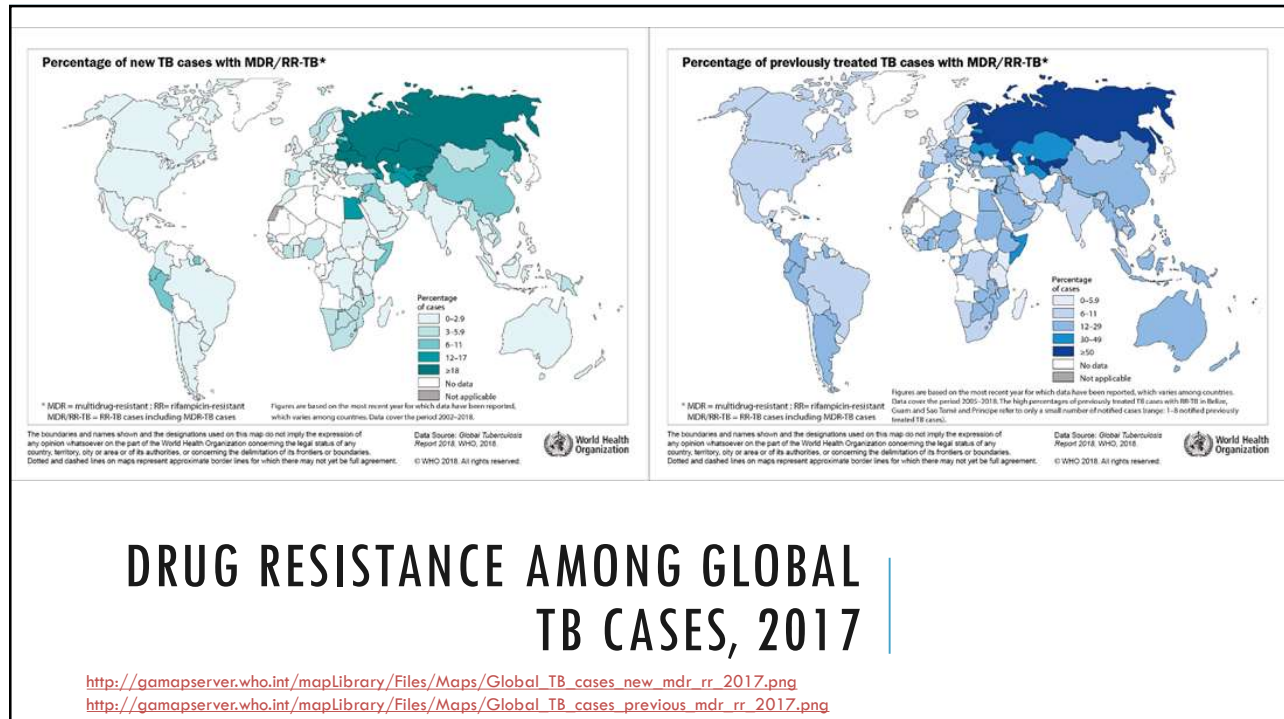
Primary Anti-TB Drug Resistance, United States, 1993–2017*



* Based on initial isolates from persons with no prior history of TB; multidrug-resistant TB (MDR TB) is defined as resistance to at least isoniazid and rifampin.

DRUG RESISTANCE AMONG TB CASES, 2014-2018





CONCLUSIONS

TB is still a leading cause of death globally

U.S. case counts and rates are declining slightly, but not enough to achieve elimination

Focus LTBI testing on those at increased risk for exposure and disease activation

Always consider population level and patient level risk factors

Highest TB burden Nationally and Locally

- 25-44 and 65+ age groups
- Persons born outside the U.S.
- U.S.-born Native Hawaiian/Pacific Islanders and American Indians/Alaska Natives
- Metropolitan Areas

CONCLUSIONS

Ohio has the largest number of cases, but Indiana has the highest rate

About 2/3 are pulmonary or pulmonary + at least one other body site

Majority are foreign-born; decrease last year; overall increase since 2010

HIV co-infection is an important risk factor; the prevalence of other risk factors is increasing

Though less than other states, drug-resistance is still a concern; especially an increase in MDR in all three states

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3. Talwar A, Tsang CA, Price SF, et al. Tuberculosis — United States, 2018. *MMWR Morb Mortal Wkly Rep* 2019;68:257–262. DOI: <http://dx.doi.org/10.15585/mmwr.mm6811a2>
4. CDC. Reported tuberculosis in the United States, 2017. Atlanta, GA: US Department of Health and Human Services, CDC; 2017. https://www.cdc.gov/tb/statistics/reports/2017/pdfs/2017_Surveillance_FullReport.pdf
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6. Haddad, M. B., Raz, K. M., Lash, T. L., Hill, A. N., Kammerer, J., Winston, C. A....Navin, T. R. (2018). Simple Estimates for Local Prevalence of Latent Tuberculosis Infection, United States, 2011–2015. *Emerging Infectious Diseases*, 24(10), 1930–1933. <https://dx.doi.org/10.3201/eid2410.180716>
7. US Census Bureau. Current estimates data. Washington, DC: US Census Bureau; 2017. <https://www2.census.gov/programs-surveys/popest/datasets/2010-2017/state/asrh/>

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