



**Indiana**  
**Department**  
**of**  
**Health**

# Epidemiology of TB in Indiana- 2021

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3/30/22

OUR MISSION:

**To promote, protect, and improve  
the health and safety of all Hoosiers.**

OUR VISION:

**Every Hoosier reaches optimal health  
regardless of where they live, learn,  
work, or play.**



# Overview

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- I. World and national TB data
- II. Indiana TB epidemiology updates
- III. Genotyping
- IV. Tabby2 webtool

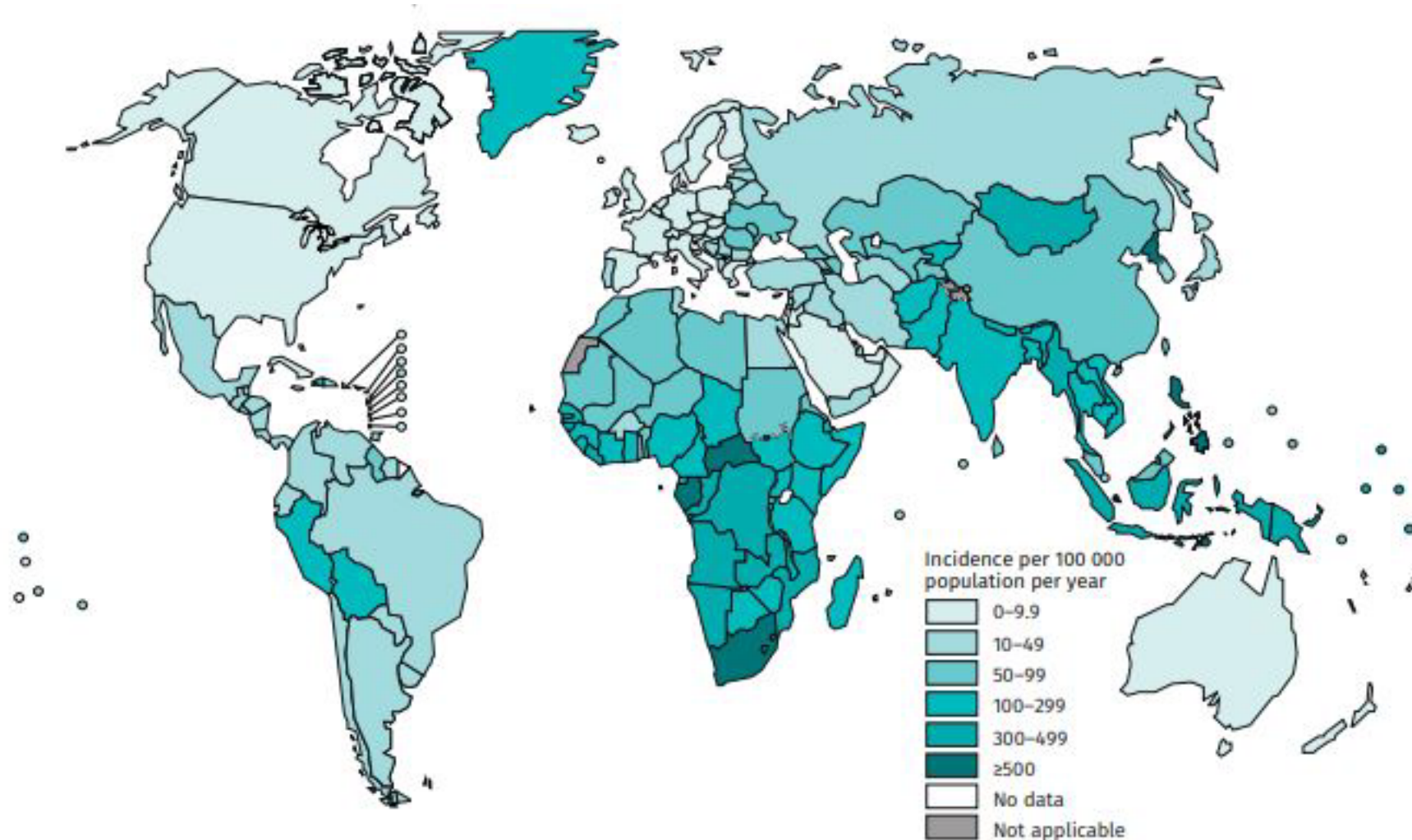


# World and national TB data

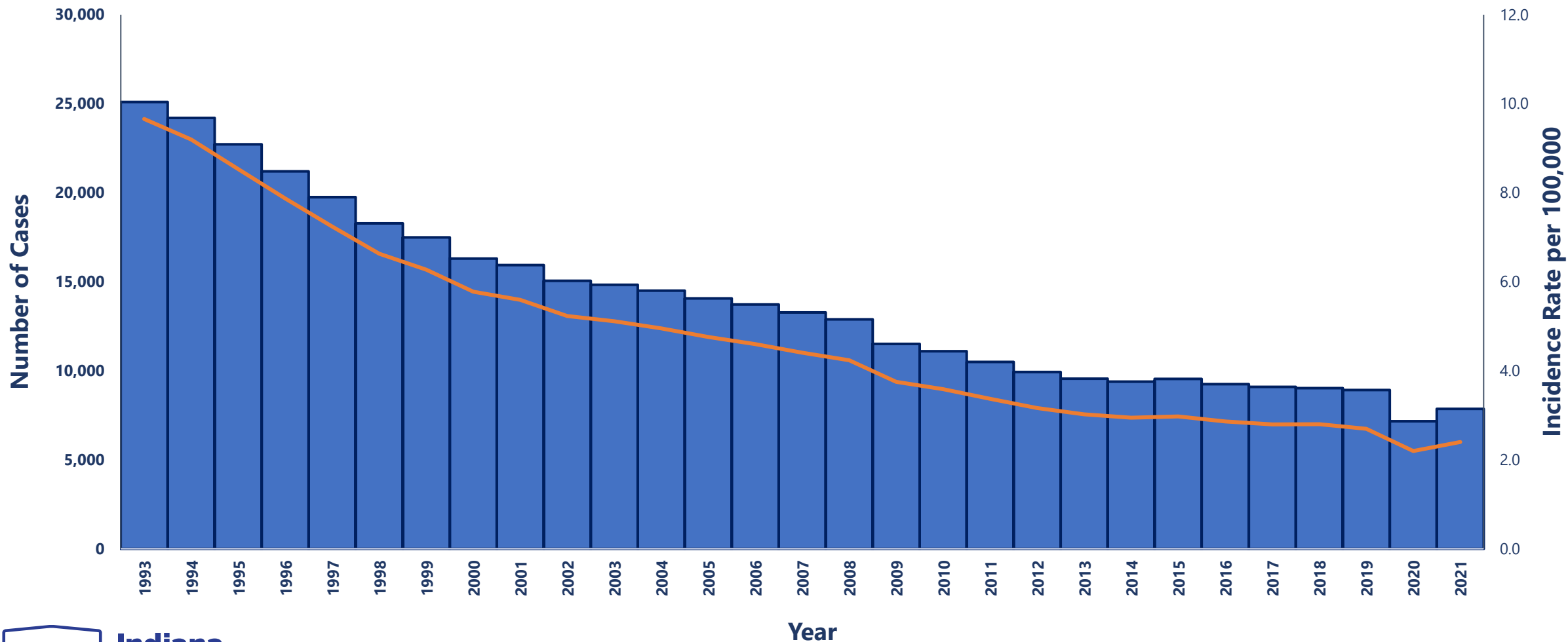


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# Annual tuberculosis incidence (per 100,000 population), worldwide, 2020



# Reported Tuberculosis (TB) Cases and Rates United States, 1993-2021



CDC Reported Tuberculosis in the United States, 2022

# Impact of COVID-19 on TB cases

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- National total TB case count decreased by 20 percent in 2020 compared to 2019
  - Largest decrease in 10-year period
  - TB cases in US had been steady from 2016 to 2019
- Possible explanation of sudden decrease:
  - Under-detection of actual TB cases
  - Limited access to healthcare during pandemic

# TB trends, United States, 2020

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Minority populations continue to be disproportionately affected by TB disease.

- Percent of total cases for race group:
  - Non-Hispanic Asian (35.8 percent) and Hispanics (29.7 percent)
  - Non-Hispanic African American (19.6 percent) and White (11.0 percent)
  - Downward trend for Native Hawaiian/other Pacific Islander and American Indian/Alaska Native

**22.5%** of cases reported having diabetes.

**71.5%** of cases occurred among non-U.S.-born people.



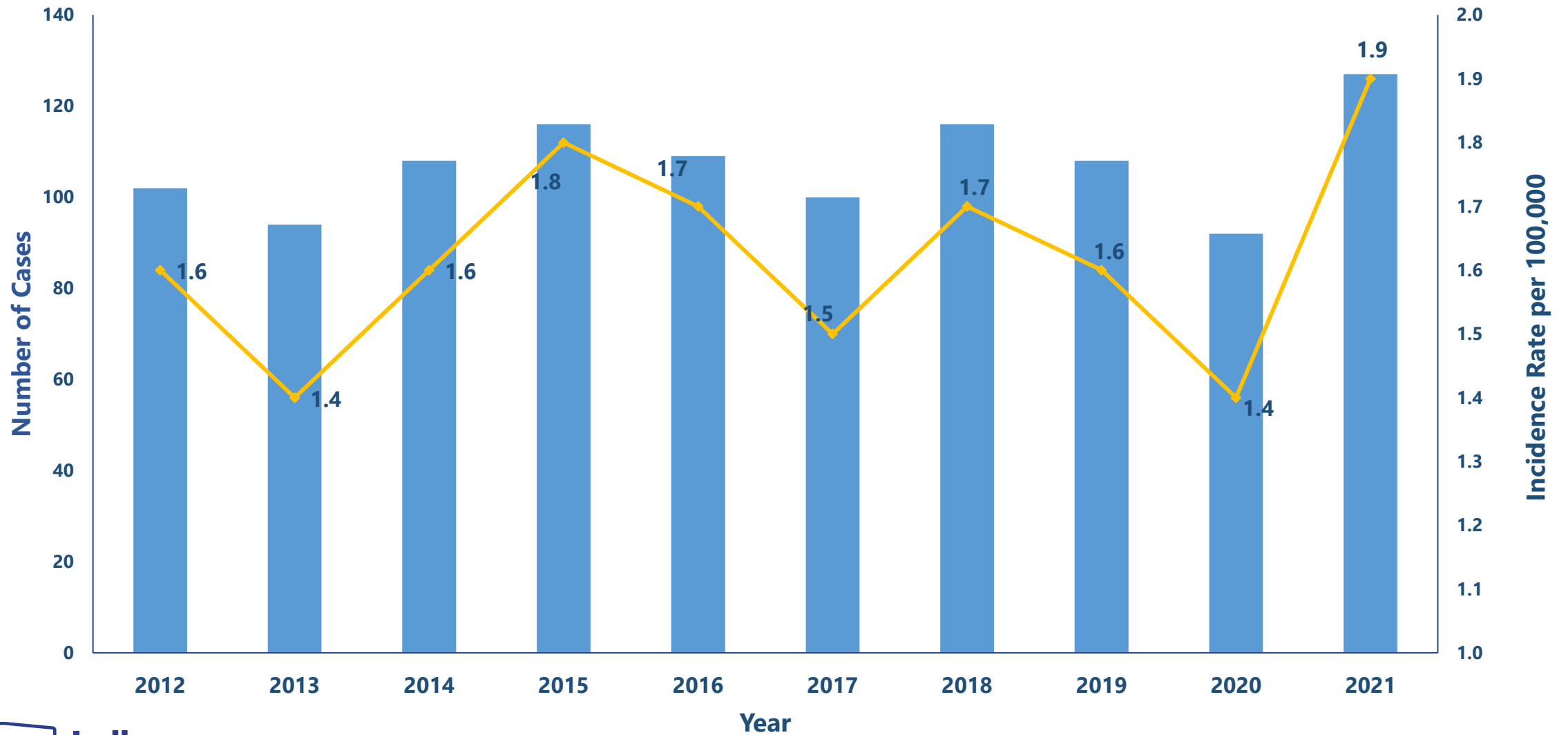
# Majority of TB cases occur in four states, United States, 2020



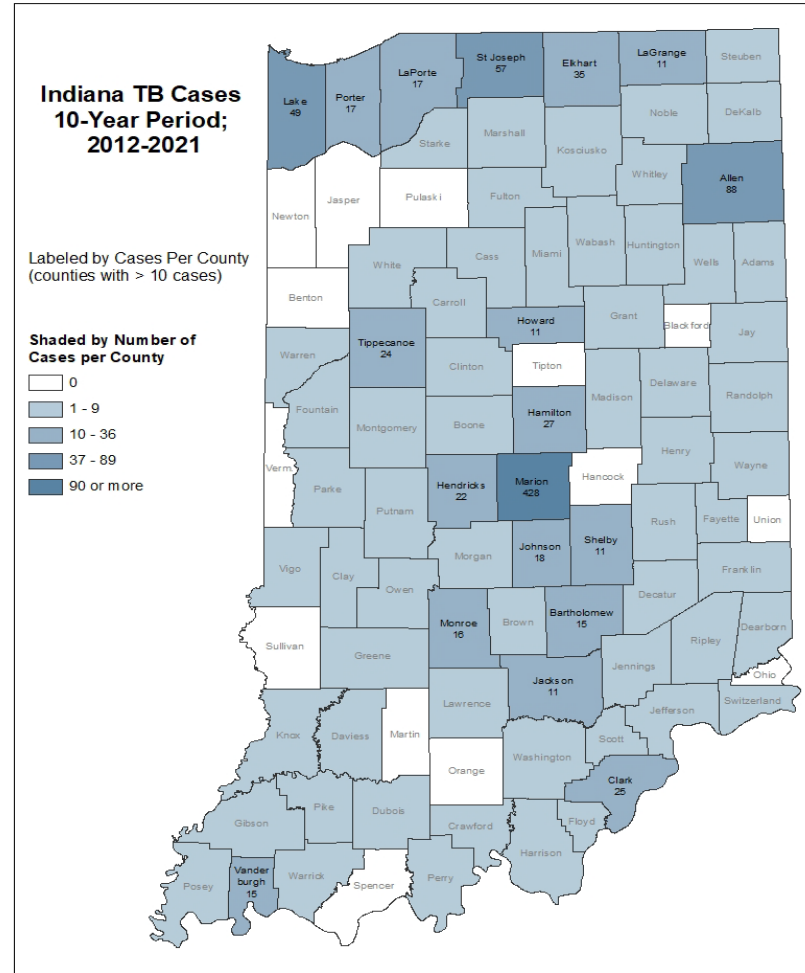
CDC Reported Tuberculosis in the United States, 2021



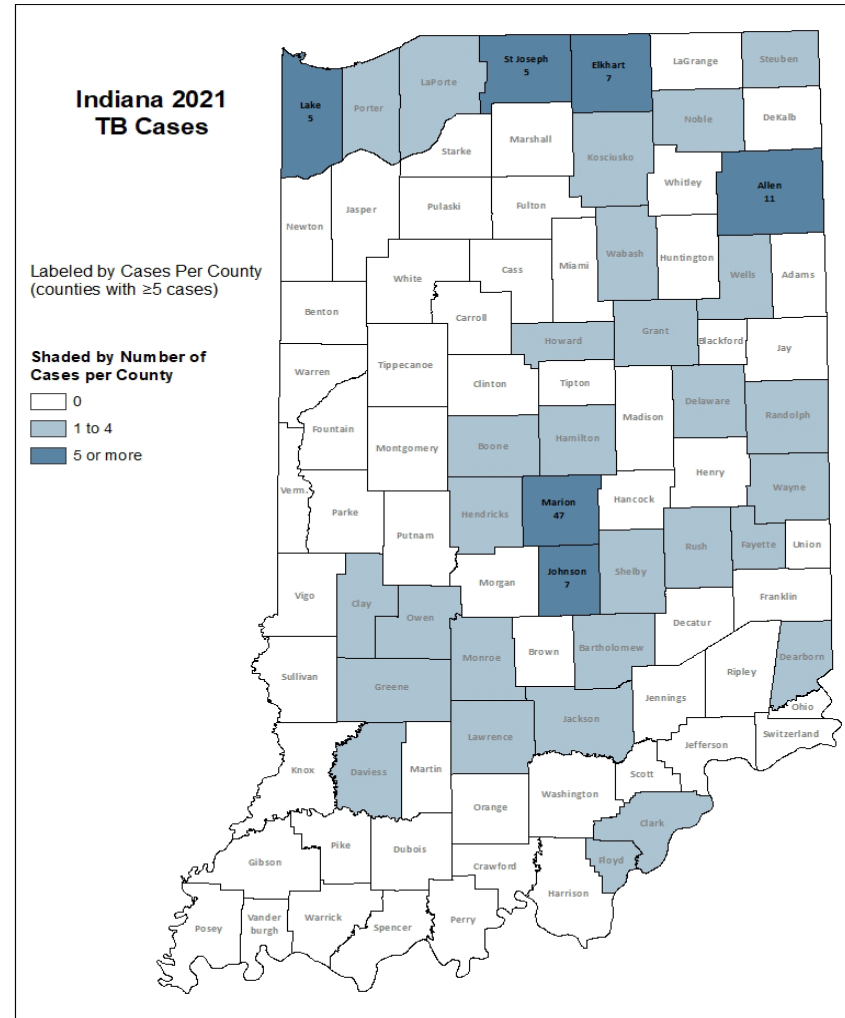
# Indiana TB 10-year trend, 2012-2021



# Indiana TB cases: 2012 to 2021



# Indiana 2021 TB cases



# Overview of TB in Indiana, 2021

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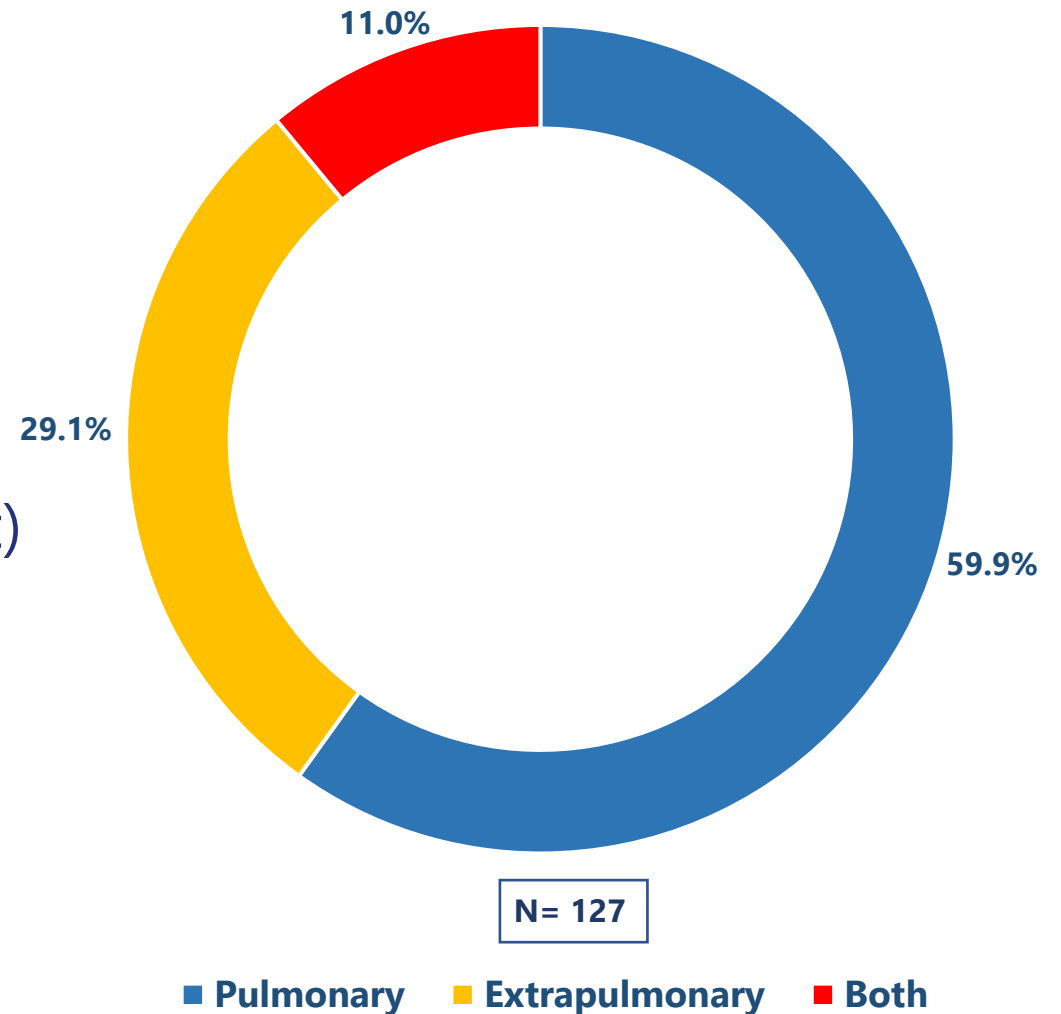
- Total TB cases: 127
  - Top jurisdictions:
    1. Marion (47)
    2. Allen (11)
    3. Elkhart and Johnson (7)
    4. Lake and St. Joseph (5)
  - Incidence rate: 1.9 cases of TB per 100,000 population
- Total reported LTBI cases: 1,159 (preliminary report)
  - Top jurisdictions:
    1. Marion (334)
    2. Tippecanoe (207)
    3. Hendricks (70)
    4. Hamilton (44)
    5. Elkhart (42)



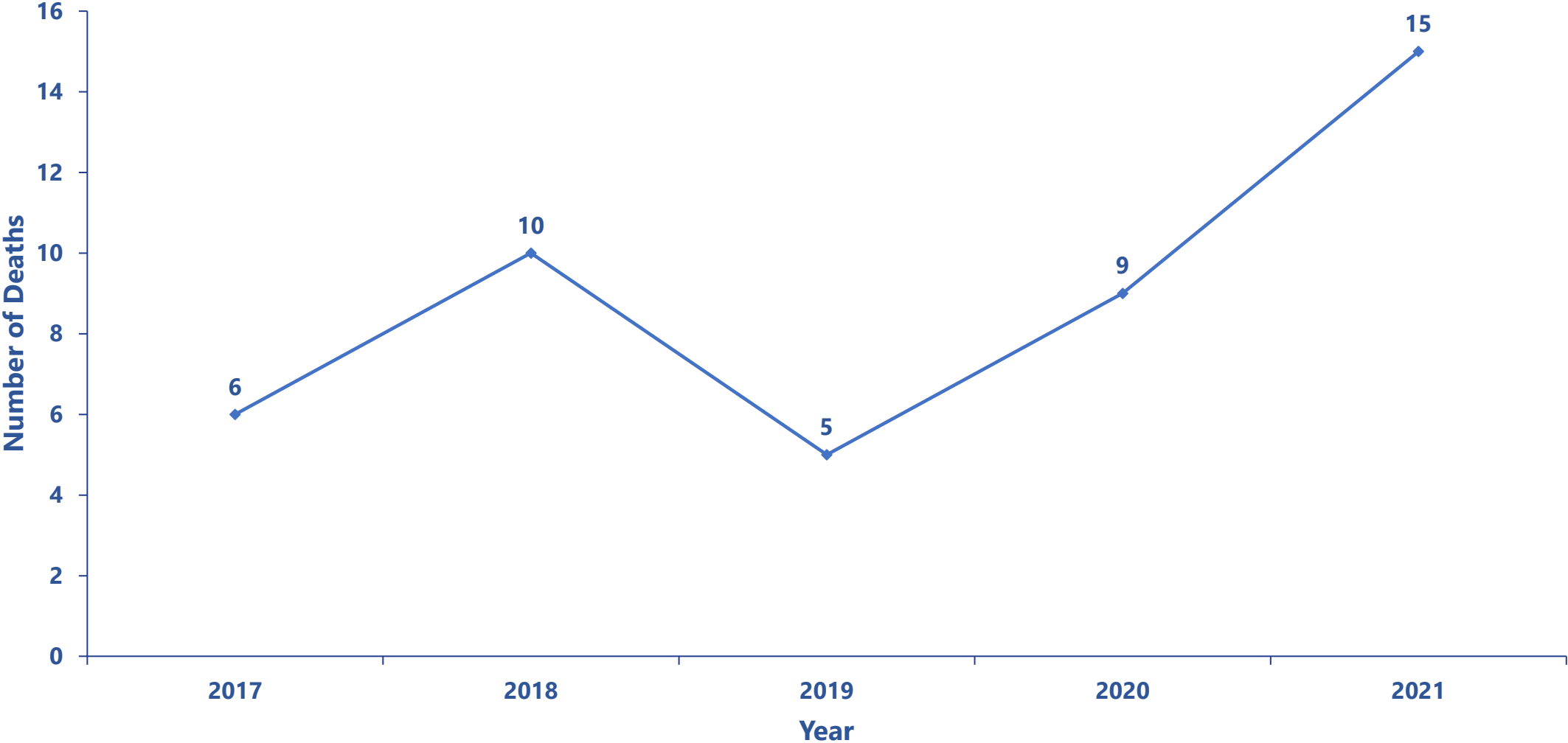
# TB cases by site of disease, Indiana, 2021

Extrapulmonary sites include:

- Bone and/or joint (57.1 percent)
- Lymphatic (8.9 percent)
- Pleural (8.9 percent)
- Peritoneal (7.1 percent)
- Eye and ear appendages (3.6 percent)
- Meningeal (3.6 percent)
- Liver (3.6 percent)

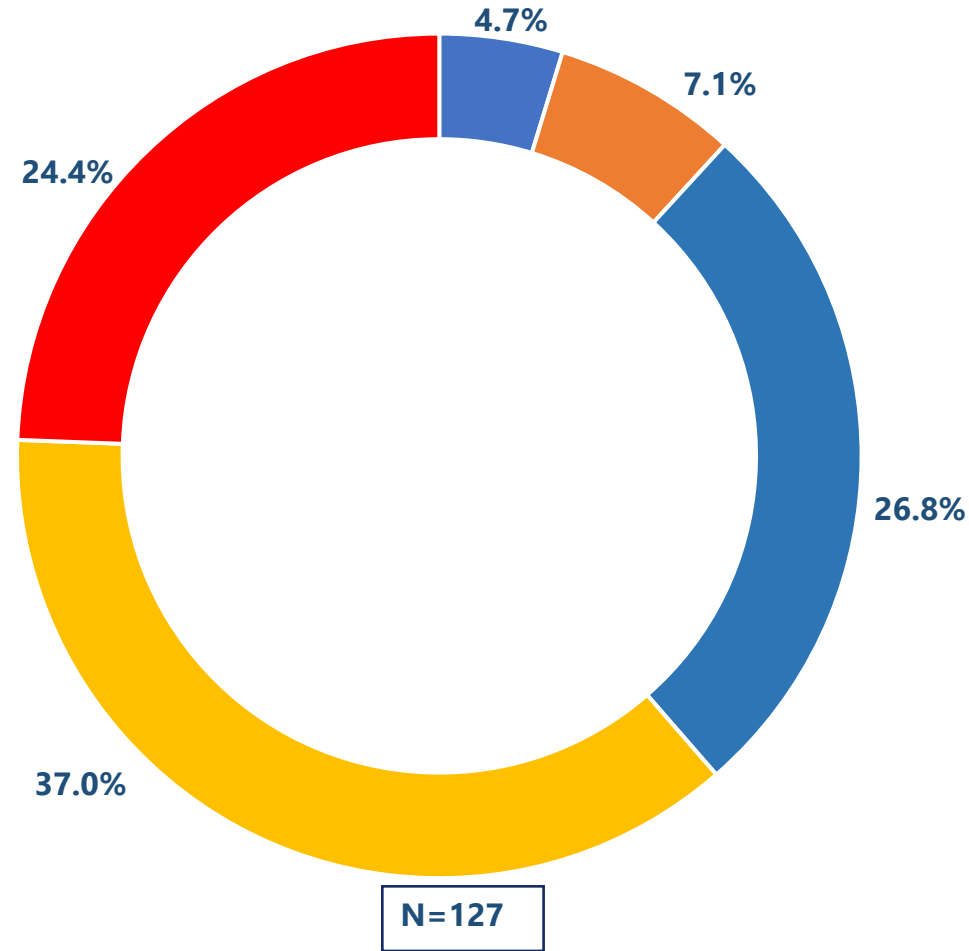


# Number of tuberculosis deaths, Indiana, 2017-2021

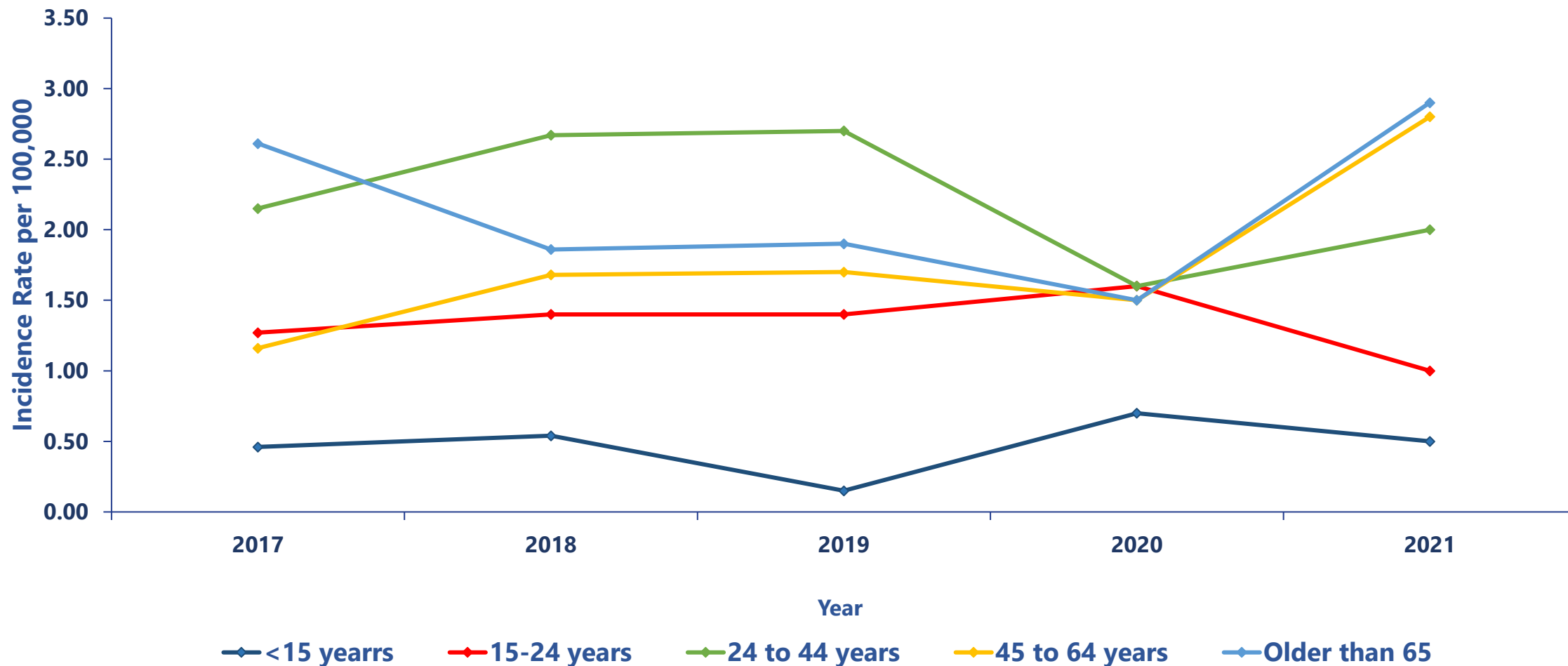




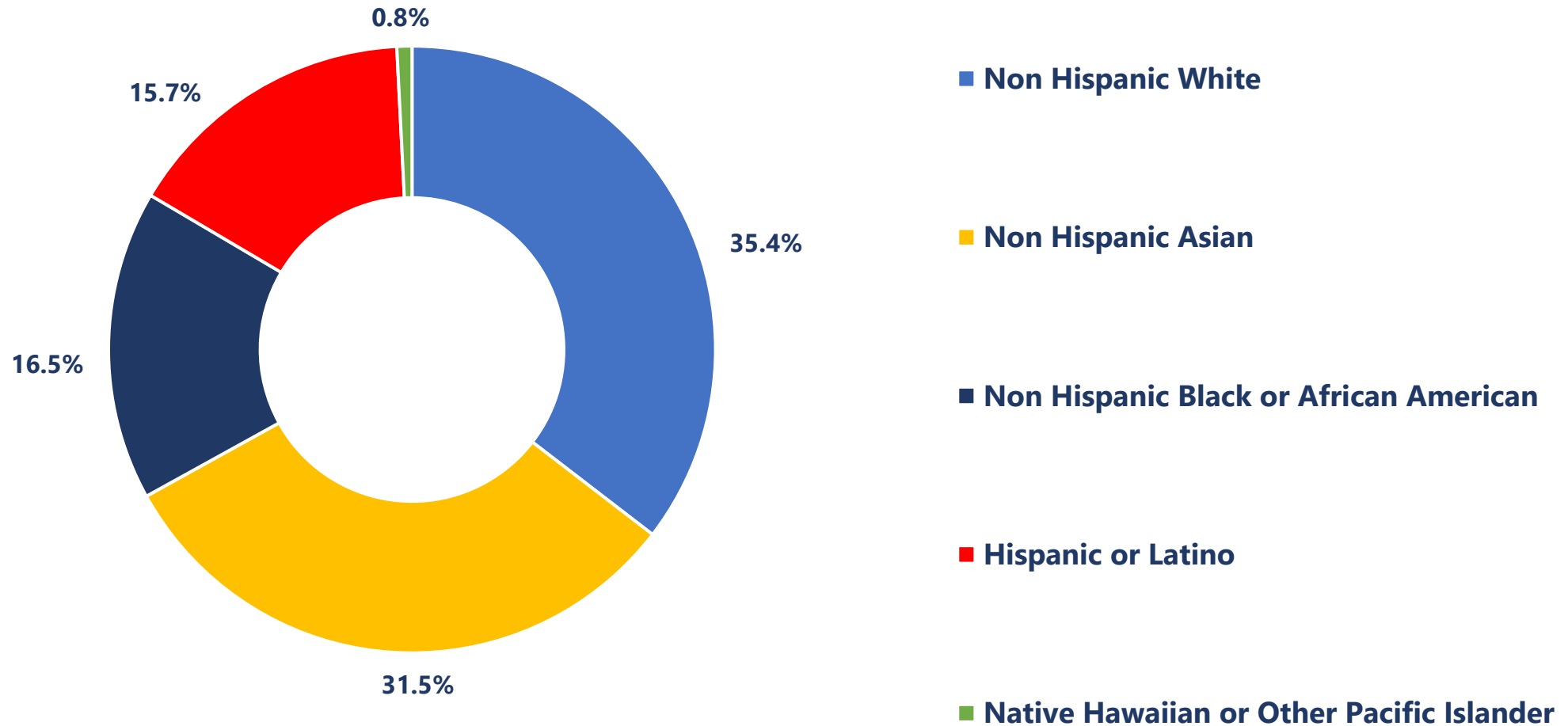
# TB cases by age group, Indiana, 2021



## TB incidence rate by age group, Indiana, 2017-2021

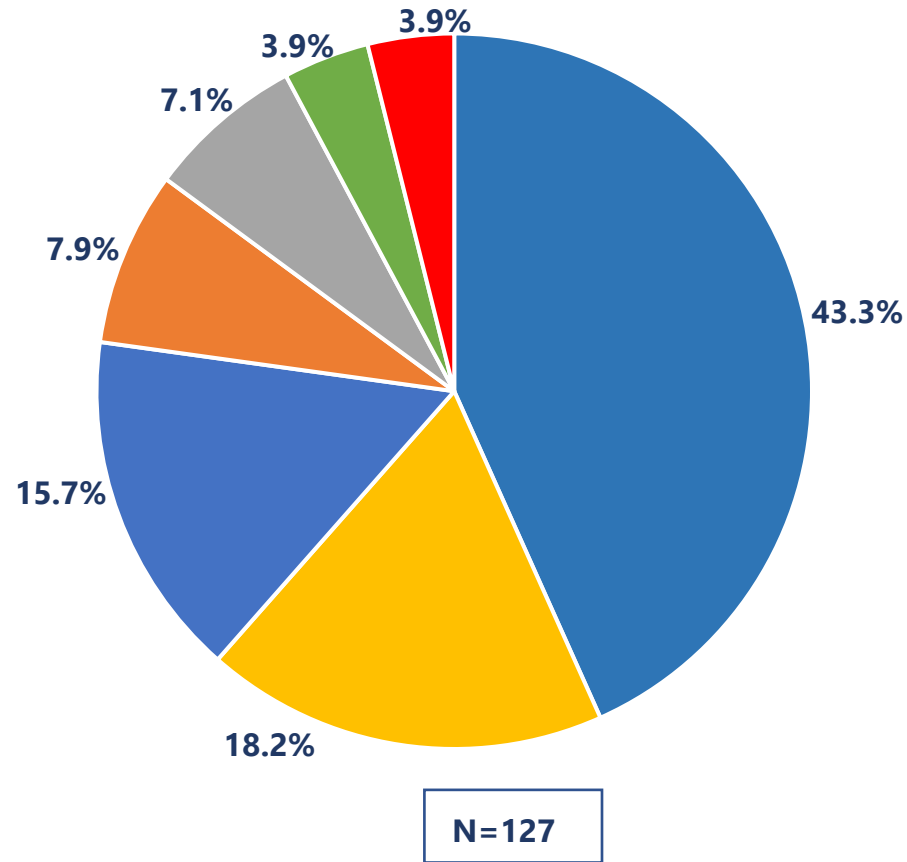


# TB cases by Hispanic ethnicity and non-Hispanic race, Indiana, 2021



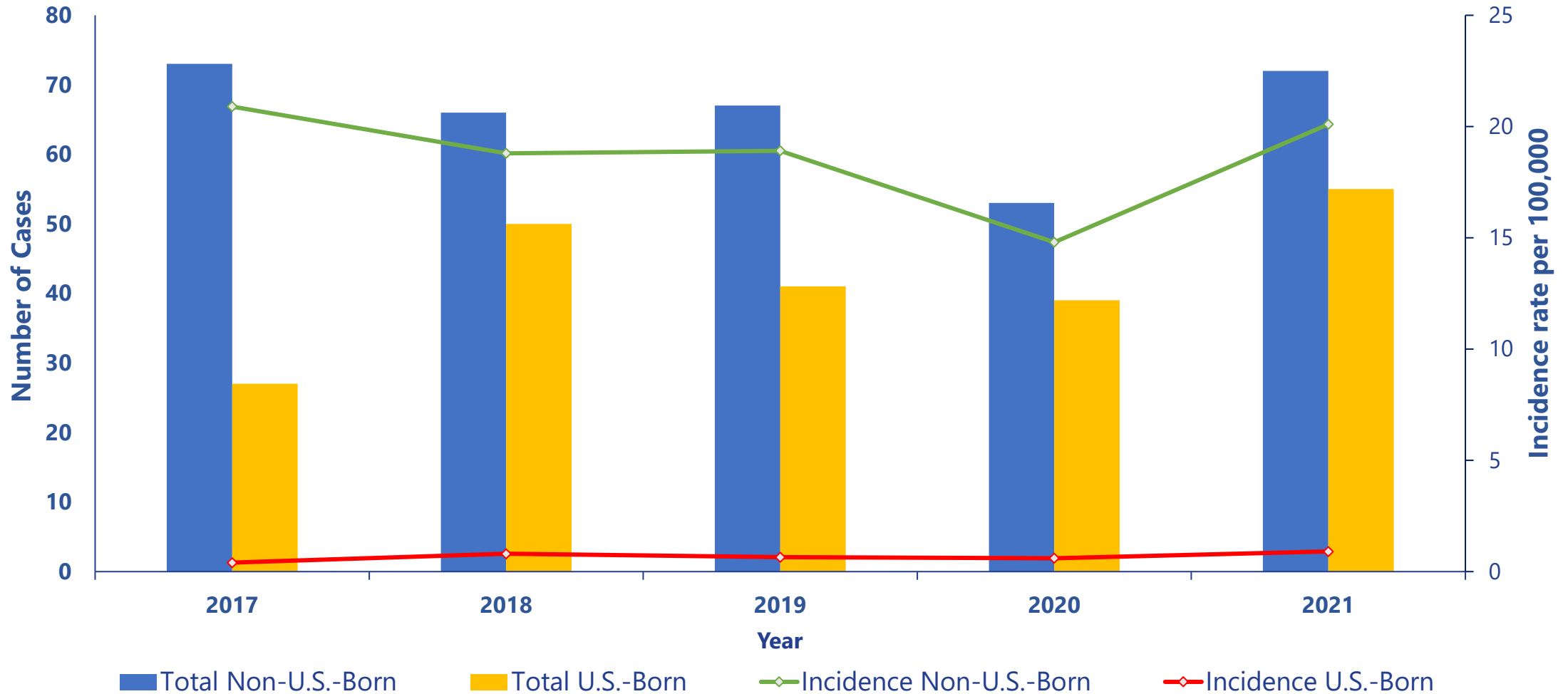
N= 127

# TB cases by country of birth, Indiana, 2021

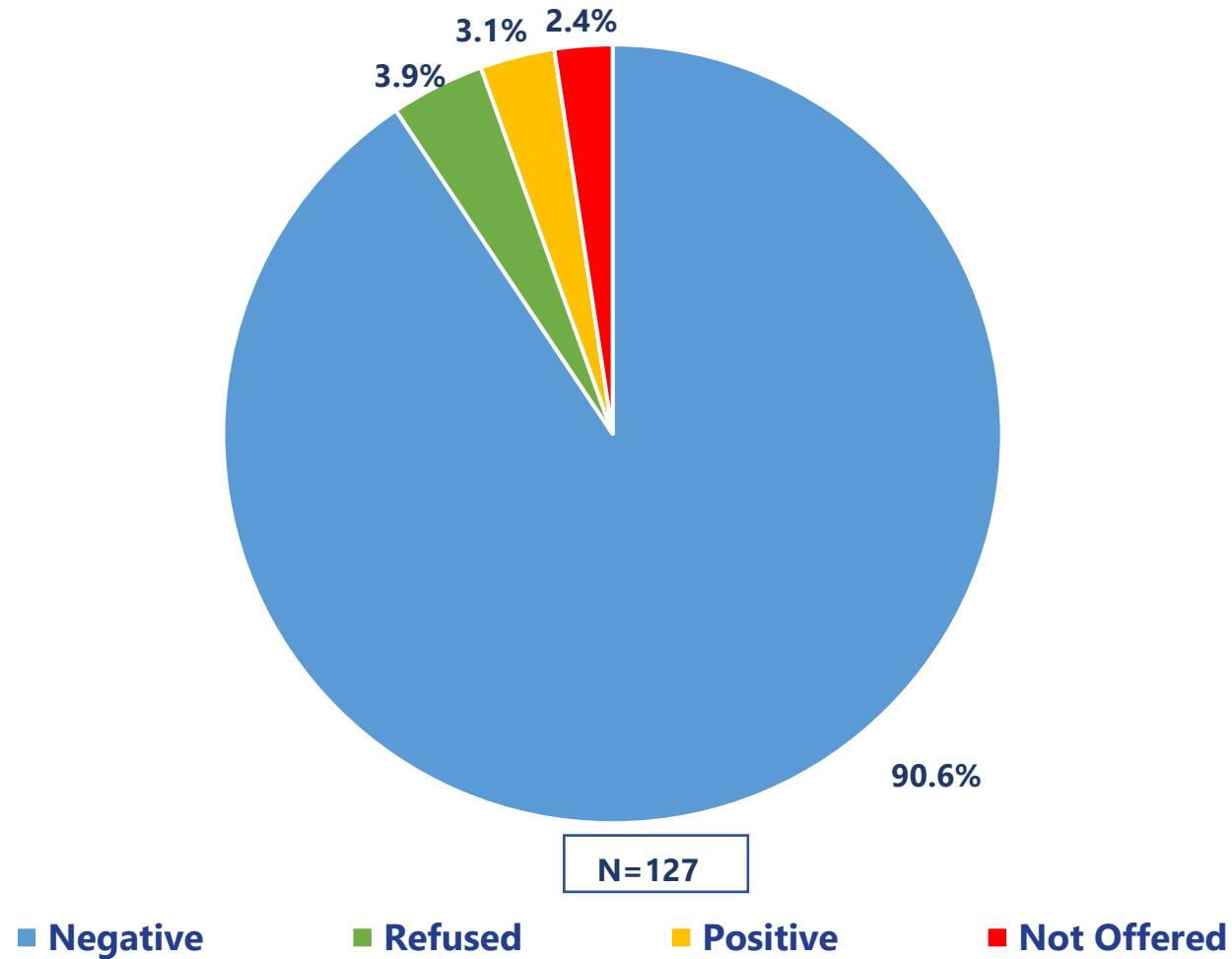


■ UNITED STATES   ■ Other   ■ BURMA/MYANMAR   ■ INDIA   ■ MEXICO   ■ PHILIPPINES   ■ AFGHANISTAN

# TB case counts and rates by country of birth, Indiana, 2017-2021



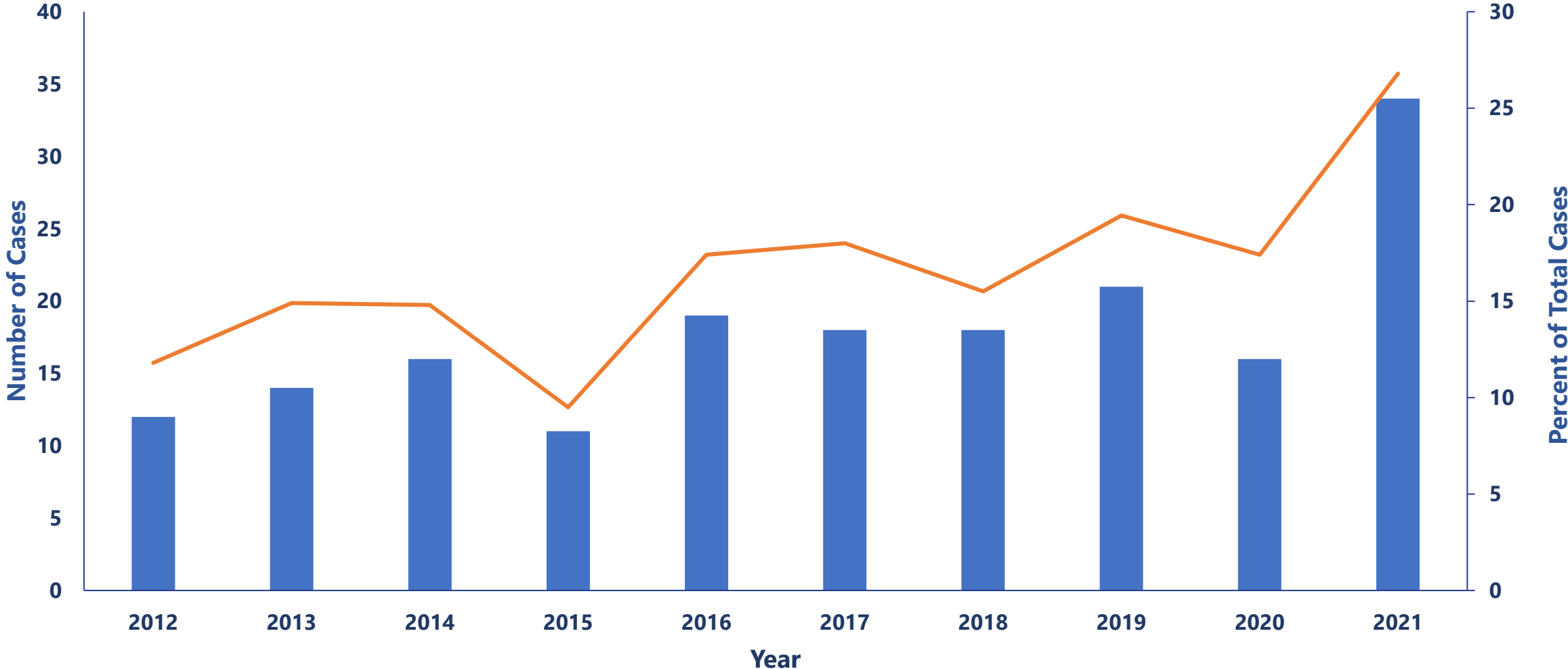
# Tuberculosis by HIV status, Indiana, 2021



# Most commonly-reported risk factors among TB Cases, Indiana, 2021

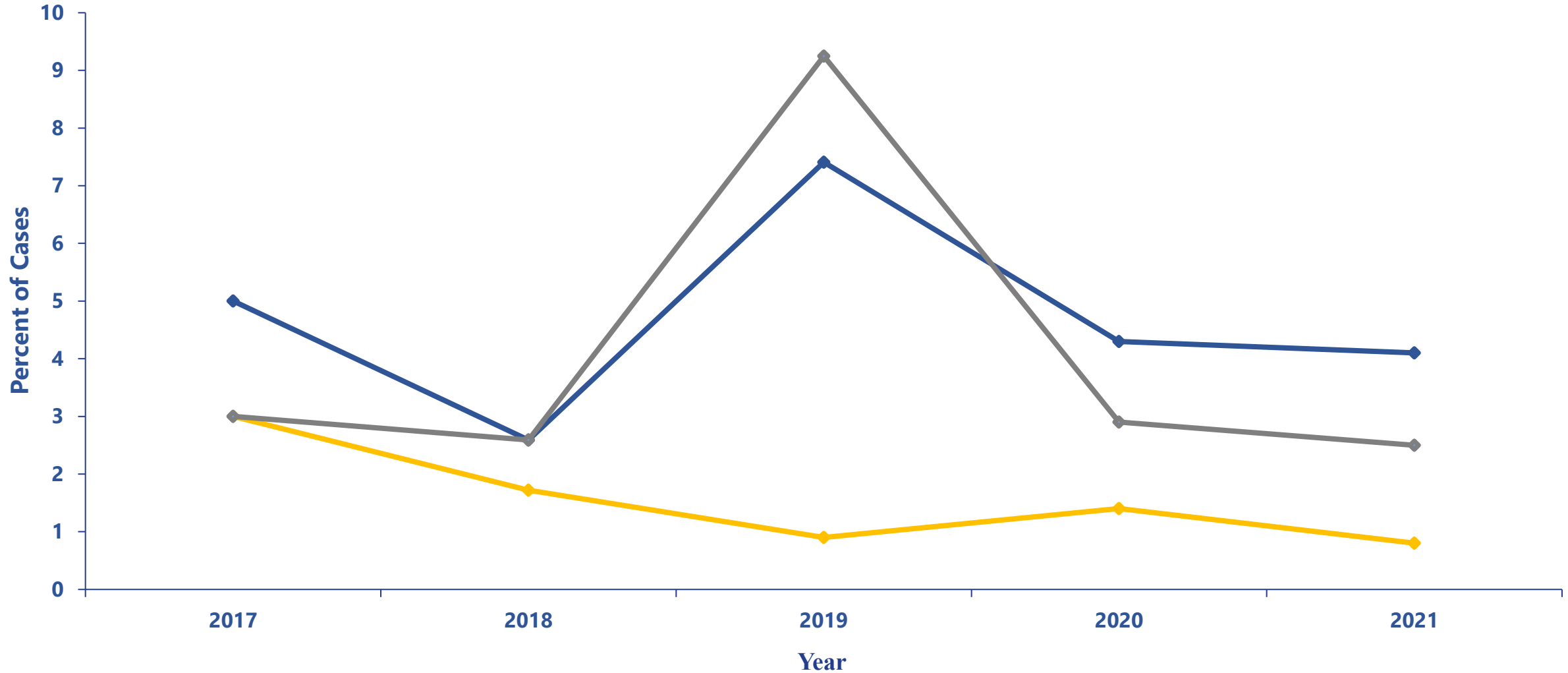
Risk Factor	Percent of Cases
Diabetes Mellitus	26.8%
Bone Graft	23.6%
Excess Alcohol Use (past year)	11.0%
Immunosuppression (not HIV/AIDS)	8.7%
Non-injection Drug Use (past year)	7.9%
Incomplete LTBI Therapy	7.9%
Contact of Infectious TB Patient	7.1%
History of Homelessness	3.1%
Correctional Facility	3.1%

# TB cases with diabetes, Indiana, 2012-2021





# Number of TB cases by drug resistance, Indiana, 2021



◆ INH Resistance    ◆ Multidrug Resistance    ◆ Other Drug Resistance



# TB treatment indicators, Indiana, 2020 to 2021

	Percent of Cases	National Average	Program Goal
Initiate RIPE (2021)	95.0%	91.2%	94.0%
Culture Conversion < 60 Days (2020)	64.4%	61.1%	73%
Completion of Therapy <1 Year (2020)	94.4%	77.7%	95.0%

# Contact investigation indicators, Indiana, 2020

	Percent of Cases	Program Goal
<b>Contacts Elicited</b>	<b>95.2%</b>	<b>95%</b>
<b>Contacts Evaluated</b>	<b>79.5%</b>	<b>75%</b>
<b>LTBI Treatment Initiated</b>	<b>85.4%</b>	<b>93%</b>
<b>LTBI Treatment Completed</b>	<b>91.4%</b>	<b>97%</b>



# Genotyping

# TB genotyping

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- Laboratory-based approach to analyze the genetic material (DNA) of *Mycobacterium Tuberculosis*
- Each culture confirmed case is genotyped
  - Help us determine transmission and similarity between strains
  - Assist us with identifying outbreak and contact investigation
  - Detect laboratory cross-contamination

# Genotyping, Indiana, 2021

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- Among 95 cases which were genotyped
- 56.8 percent of genotyped cases were identified as part of a cluster
  - 16 were part of bone graft cluster
  - 13 new genotype clusters were identified
  - No ongoing outbreaks
    - Recurring cases from previous outbreaks

# Clusters of Interest- IN\_0204 (MTBC016498)

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- 16 cases in Indiana (2021)
- Risk factor
  - Implanted affected bone graft in their body
    - 30 patients received MTB affected bone graft

# Cluster of interest- IN\_0162 (MTBC002466)

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- 12 cases in IN (2015-2021)
  - Two cases from 2021
- Risk factors:
  - Unknown connection ( four cases within 2020 and 2021)
  - Close contact with index case (seven cases)
- Index risk factor:
  - Came to U.S. from Congo (2012)





# Tabby2 webtool

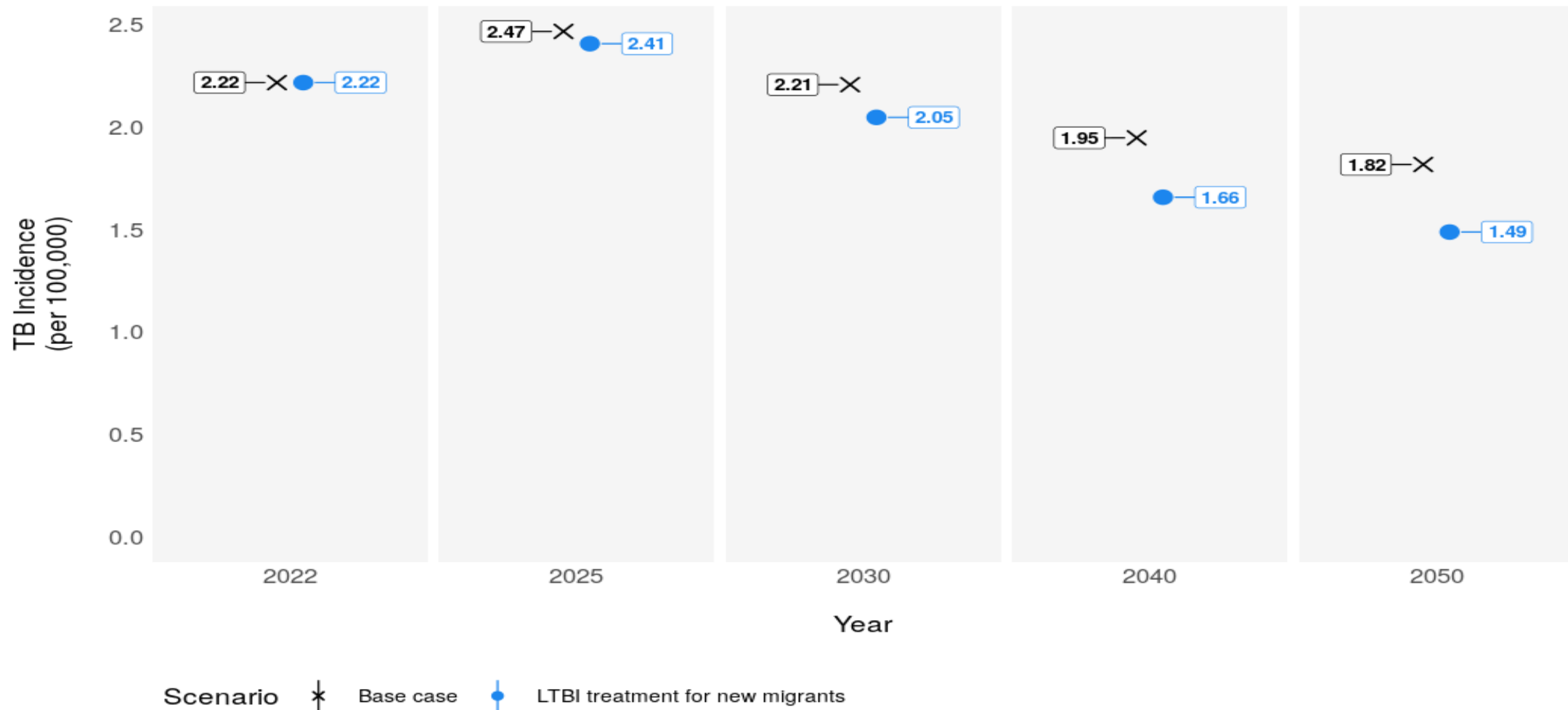
# Tabby2 webtool

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- It allows users to estimate future TB and LTBI cases in the US based on a published TB transmission model
  - Available at <https://ppmltools.org/tabby2/>
- This model is built to fit data from all US states and Washington, D.C.
  - Data current through 2019
- There are two type of scenarios:
  - Predefined scenarios and custom scenarios
- It also allows users to calculate costs for various LTBI and TB interventions

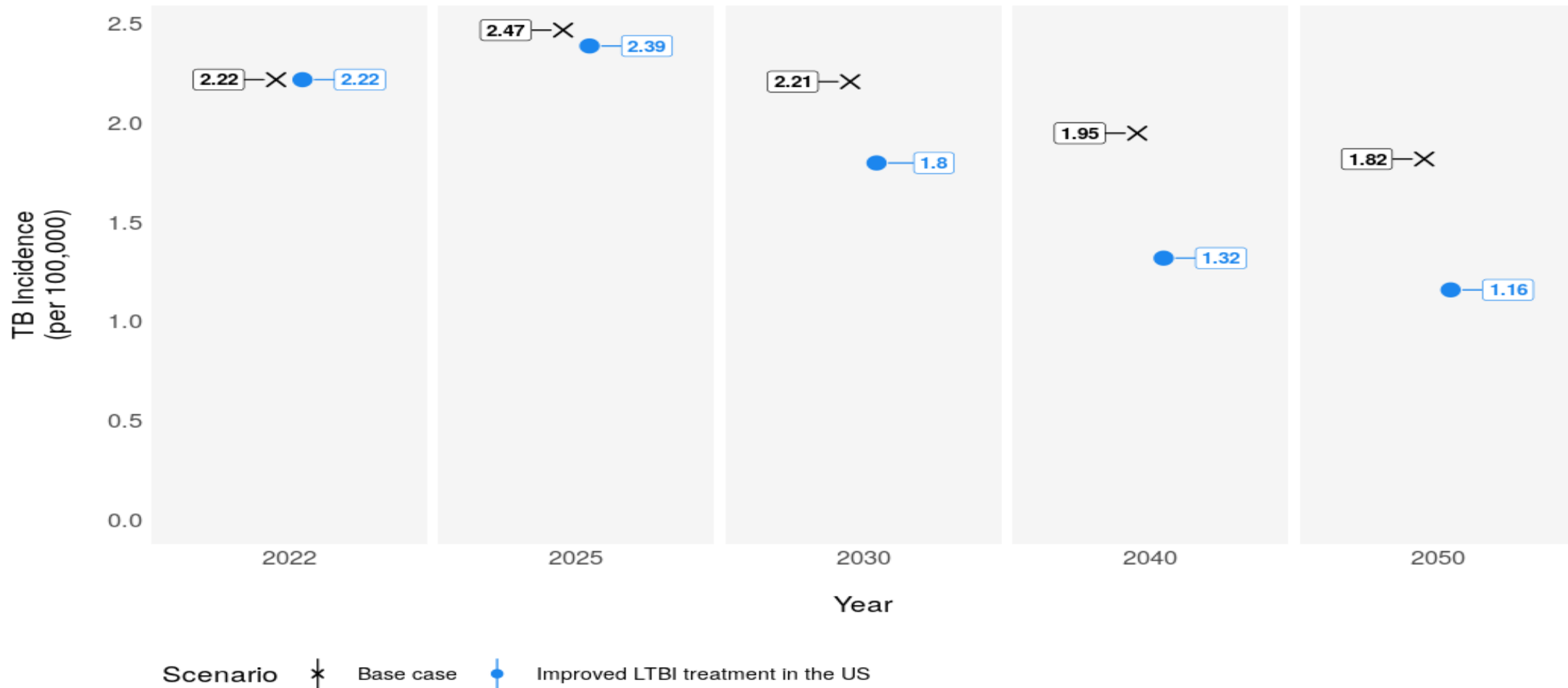
# 1. LTBI treatment for new migrants

Projected TB Incidence (per 100,000) in the total population, all age groups in Indiana



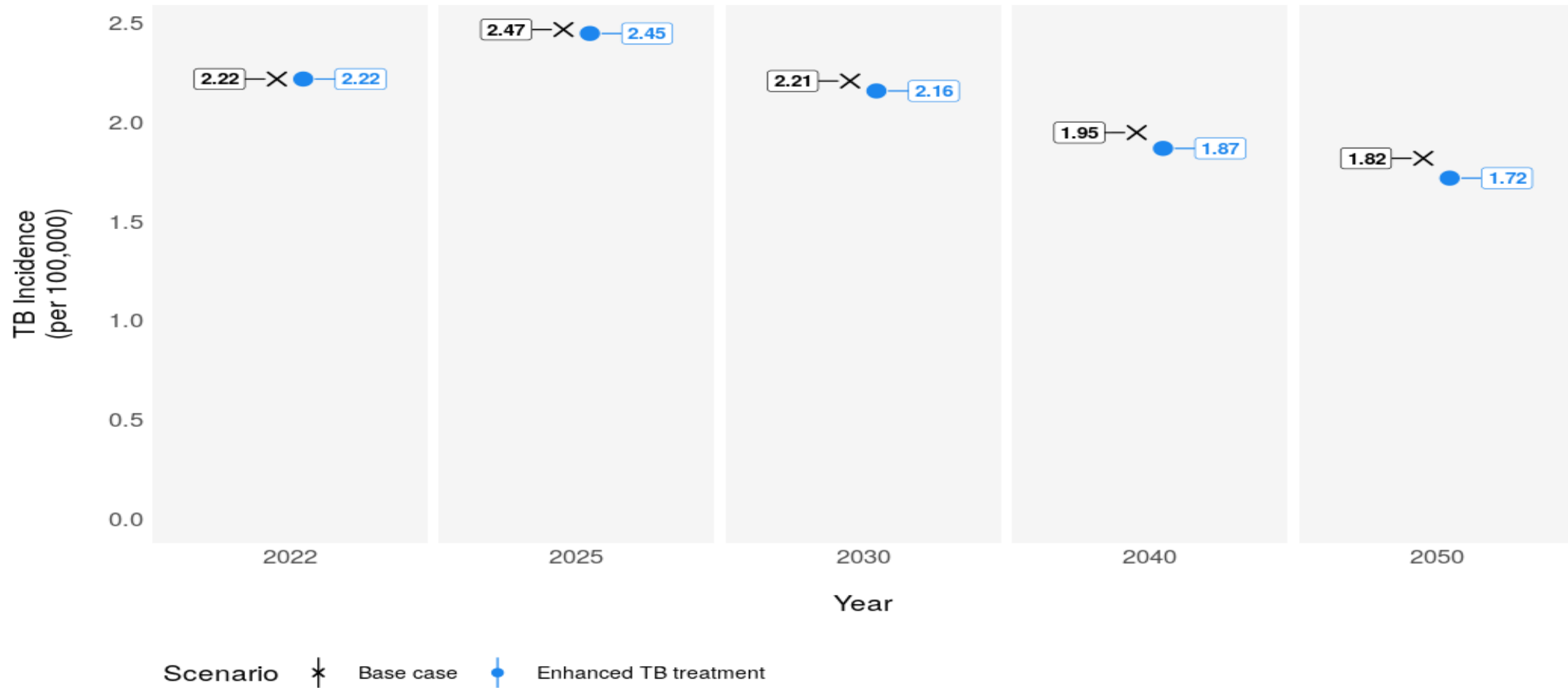
# 2. Improved LTBI treatment in the U.S.

Projected TB Incidence (per 100,000) in the total population, all age groups in Indiana



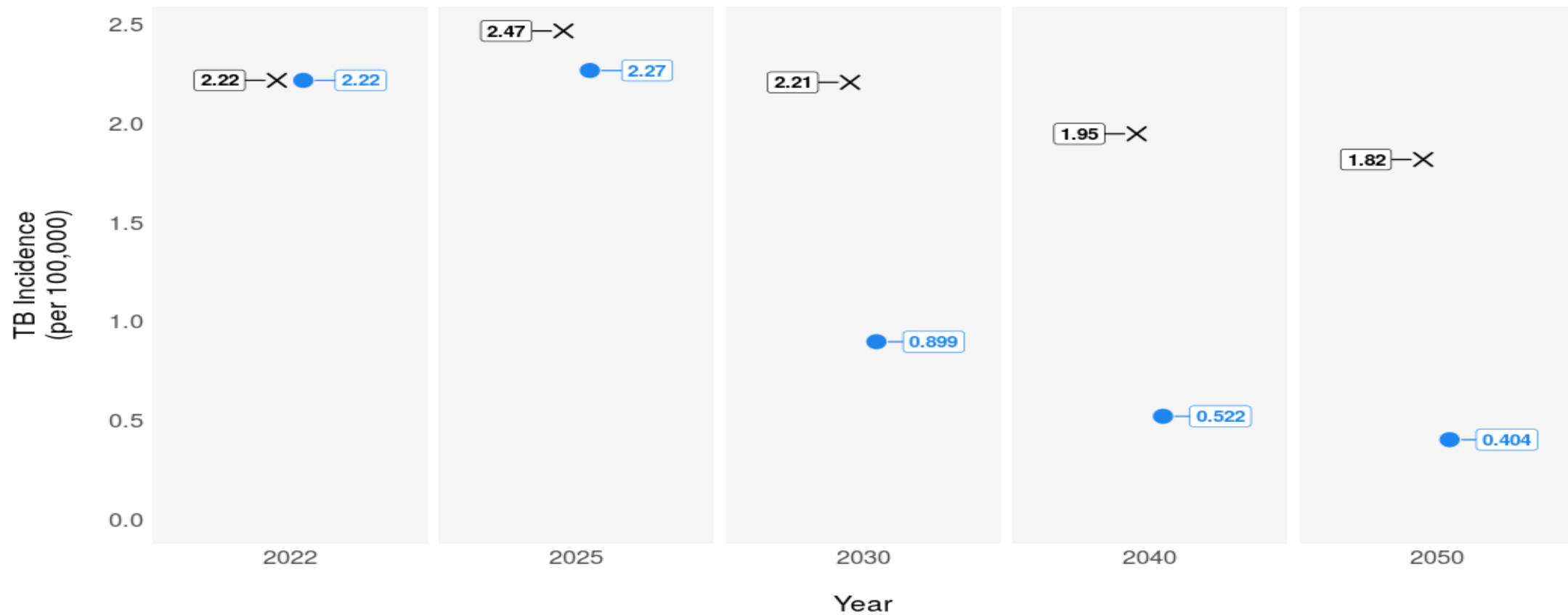
# 3. Enhanced TB treatment

Projected TB Incidence (per 100,000) in the total population, all age groups in Indiana



# 4. Enhanced case detection

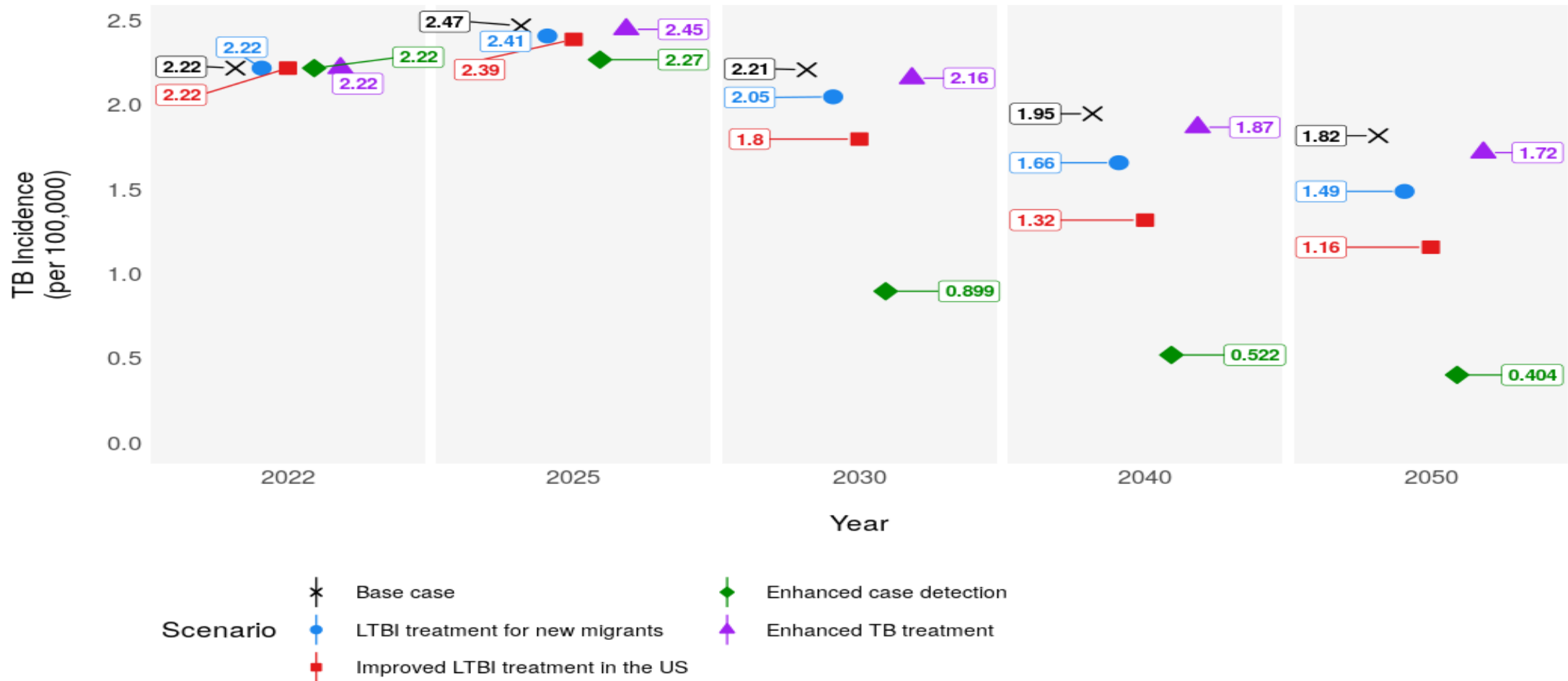
Projected TB Incidence (per 100,000) in the total population, all age groups in Indiana



Scenario \* Base case • Enhanced case detection

# The four modeled scenarios

Projected TB Incidence (per 100,000) in the total population, all age groups in Indiana



# Summary

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- The number of TB cases and deaths increased in 2021
  - Cases increase directly related to bone graft outbreak
- Proportion of U.S.-born cases increased
- Risk factors: diabetes and excess alcohol use are increasing
- Continued success in TB treatment and case management indicators:
  - HIV testing
  - Genotyping
  - Completion of treatment
  - Contact Investigation



# Questions?

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