Epidemiology of TB in the RMI and USAPI

The Road to Elimination-A situational update (2024)

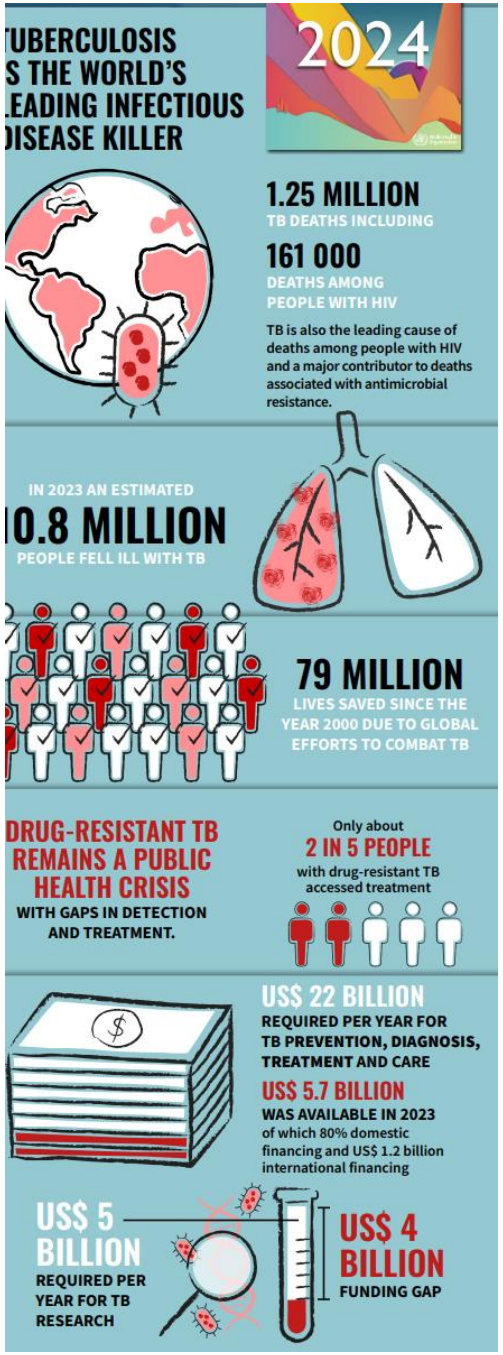
Regional TB Training, Majuro, RMI

December 10th, 2024.

Outline & Brief

- ❑Global TB burden
- ❑Regional Burden
- ❑TB in the RMI- Descriptive epidemiology.
- ❑Drivers of TB in the RMI and region

- ***TB remains a key public health concern. TB control in the region will require a scaled up and sustained response over successive years to ensure a meaningful decline in incidence. Reaching hard to reach population and promoting universal health coverage (UHC) is key to leaving no one behind”***



Tuberculosis-Global Burden of Disease

In 2023, 10.8M people fell ill with TB (95%CI 10.1M-11.7M)

12% cases occurred in children

PLHIV accounted for 6.1%

2020-2022: 4.6% increase in TB incidence. Reversing a 2% decrease per year seen over the preceding 20 years.

1.25M deaths

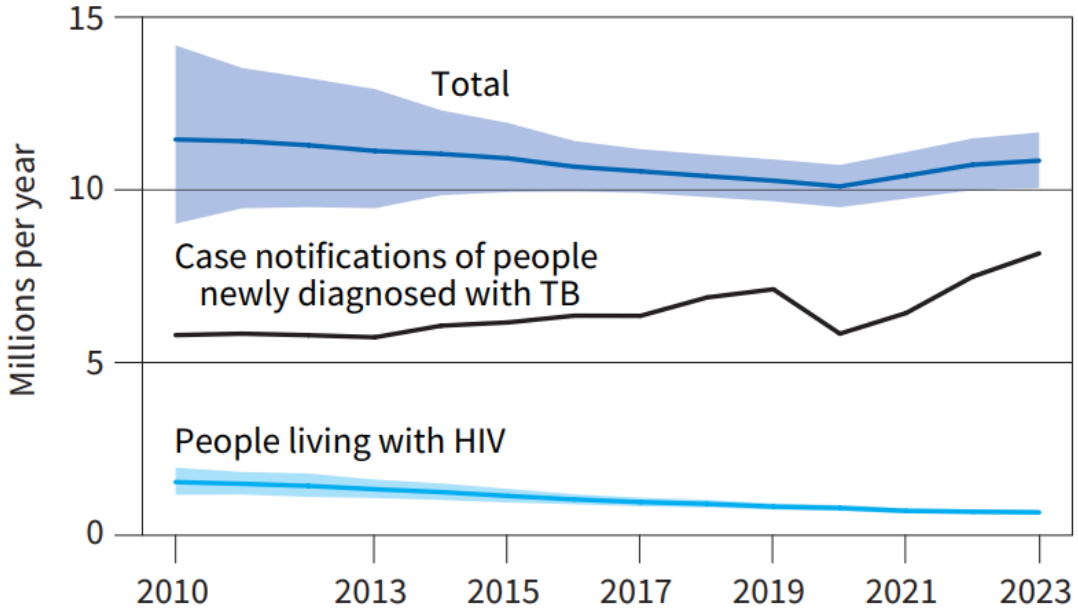
161000 among PLHIV

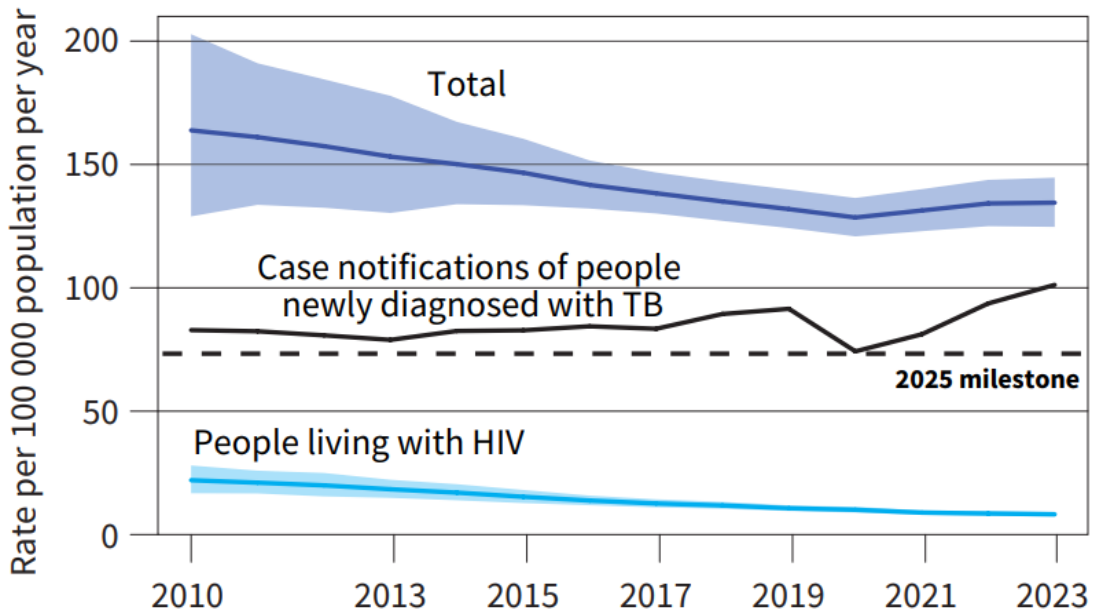
Tuberculosis is the top infectious killers globally.

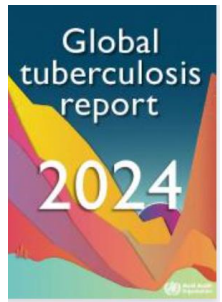
World Health Organization

Global trends in the estimated number of incident TB cases (left) and the incidence rate (right), 2010–2023

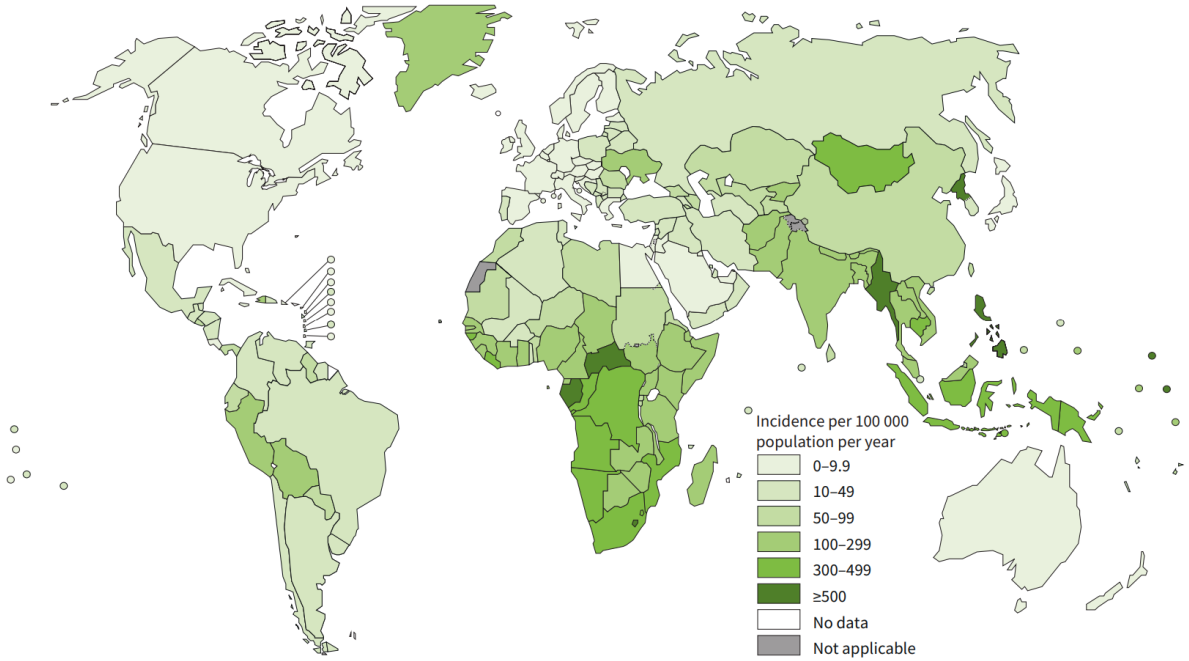
The horizontal dashed line shows the 2025 milestone of the End TB strategy, which is a 50% reduction in the TB incidence rate between 2015 and 2025. Shaded areas represent 95% uncertainty intervals.



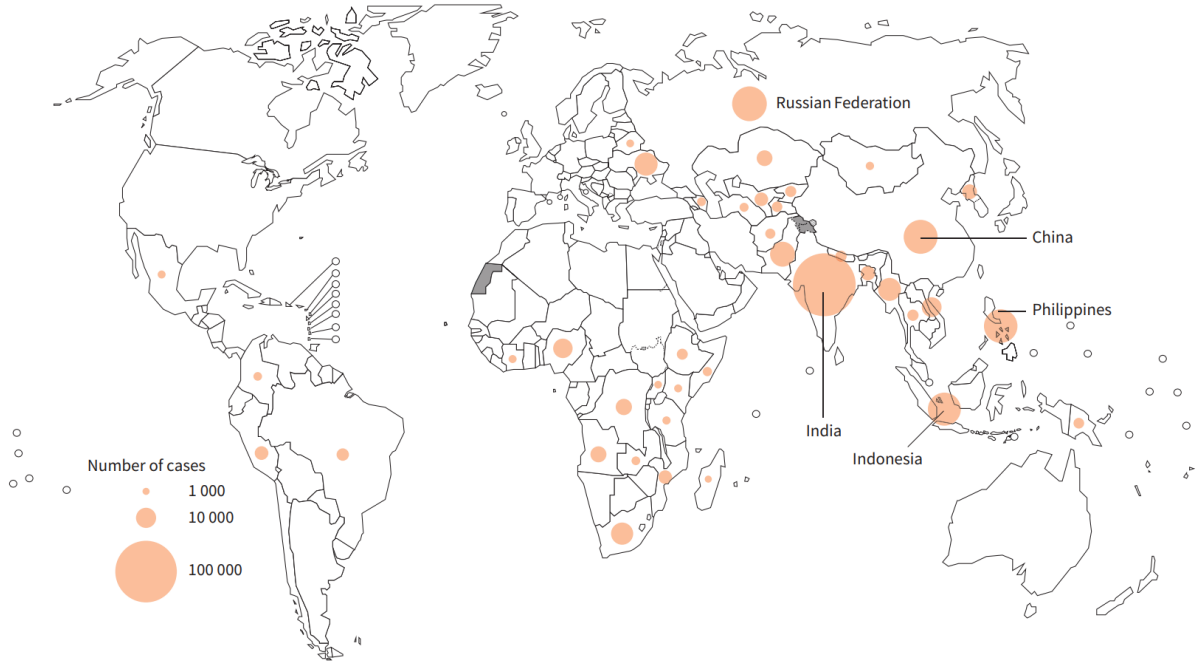




Estimated TB incidence rates, 2023



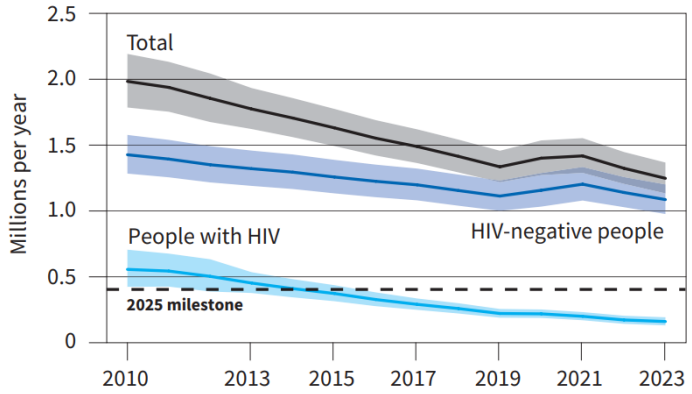
Estimated number of people who developed MDR/RR-TB (incident cases) in 2023, for countries with at least 1000 incident cases[a]

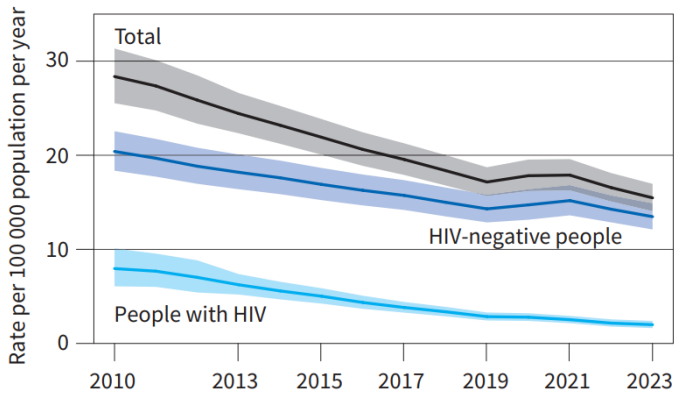


[a] The labels show the five countries that accounted for more than half of the global number of people estimated to have developed MDR/RR-TB in 2023.

Global trends in the estimated number of deaths caused by TB (left) and the TB mortality rate (right),[a] 2010–2023

The horizontal dashed line shows the 2025 milestone of the End TB strategy, which is a 75% reduction in the total number of TB deaths between 2015 and 2025. Shaded areas represent 95% uncertainty intervals.



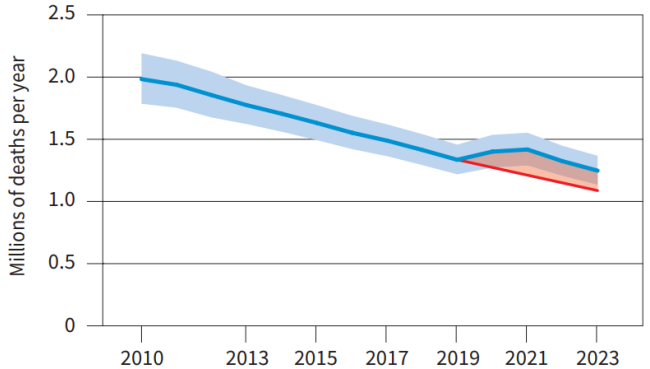


Global TB Mortality trends.

[a] Deaths from TB among people with HIV are officially classified as deaths caused by HIV/AIDS, with TB as a contributory cause.

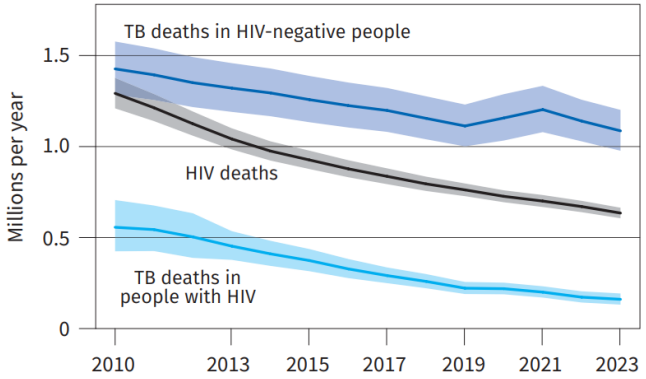
Estimated number of excess TB deaths during the COVID-19 pandemic and its aftermath, 2020–2023

The **blue** shaded area represents the 95% uncertainty interval of the actual number of deaths estimated to have been caused by TB; the **red** line shows the estimated number of deaths that would have been caused by TB in the absence of the COVID-19 pandemic; the **red** shaded area shows the excess number of deaths caused by TB due to disruptions associated with the COVID-19 pandemic.



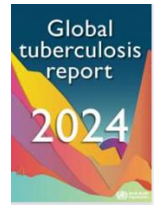
Global trends in the estimated number of deaths caused by TB and HIV (in millions), 2010–2023[a,b]

Shaded areas represent 95% uncertainty intervals.



[a] For HIV/AIDS, the latest estimates of the number of deaths in 2023 that have been published by UNAIDS are available at http://www.aids.org/en/ (accessed 12 July 2024). For TB, the estimates for 2023 are those published in this report.

[b] Deaths from TB among people with HIV are officially classified as deaths caused by HIV/AIDS in the International Classification of Diseases.



TAKE ON TB

Too many people still suffer from tuberculosis (TB).

TB IN THE U.S.

Up to **13 million** people could have latent TB infection

9,633 people were diagnosed with TB disease in 2023, a 15.6% increase compared with 2022

565 people died of TB-related causes in 2022

The increase in TB disease highlights the need to regain momentum toward the United States' goal of eliminating TB.

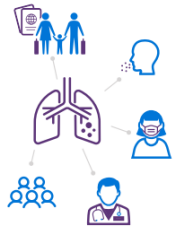
CDC

www.cdc.gov/tb

NOVEMBER 2024

HEALTH CARE PROVIDERS CAN TAKE ACTION TO END TB

1 Think TB

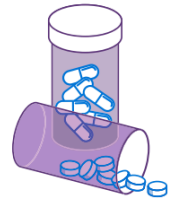


Recognize risk factors and symptoms of TB.

2 Test for TB

Use the TB blood test for people at increased risk of TB infection.

3 Treat TB



Prescribe shorter regimens to help patients finish treatment.

TB CAN HAPPEN ANYWHERE & TO ANYONE

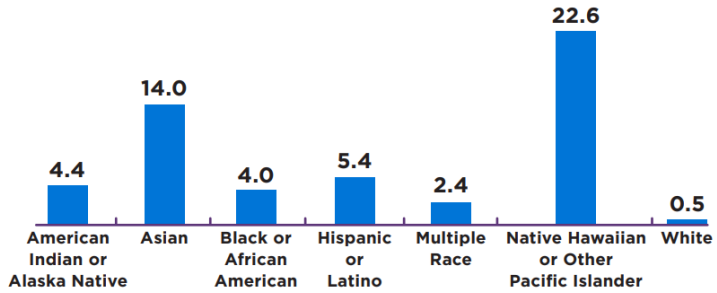
But some groups are at greater risk of TB than others. To eliminate TB, we must prioritize groups at increased risk of TB.

7 out of 10

TB cases occurred among non-U.S.-born persons

Racial and ethnic disparities in TB diagnoses continue to exist.

TB Incidence Rates per 100,000 Population*



*All persons are non-Hispanic except for those who identified as Hispanic or Latino.

CDC IS COMMITTED TO ENDING TB IN THE UNITED STATES

CDC supports finding and treating TB disease and expanding testing and treatment for latent TB infection through:

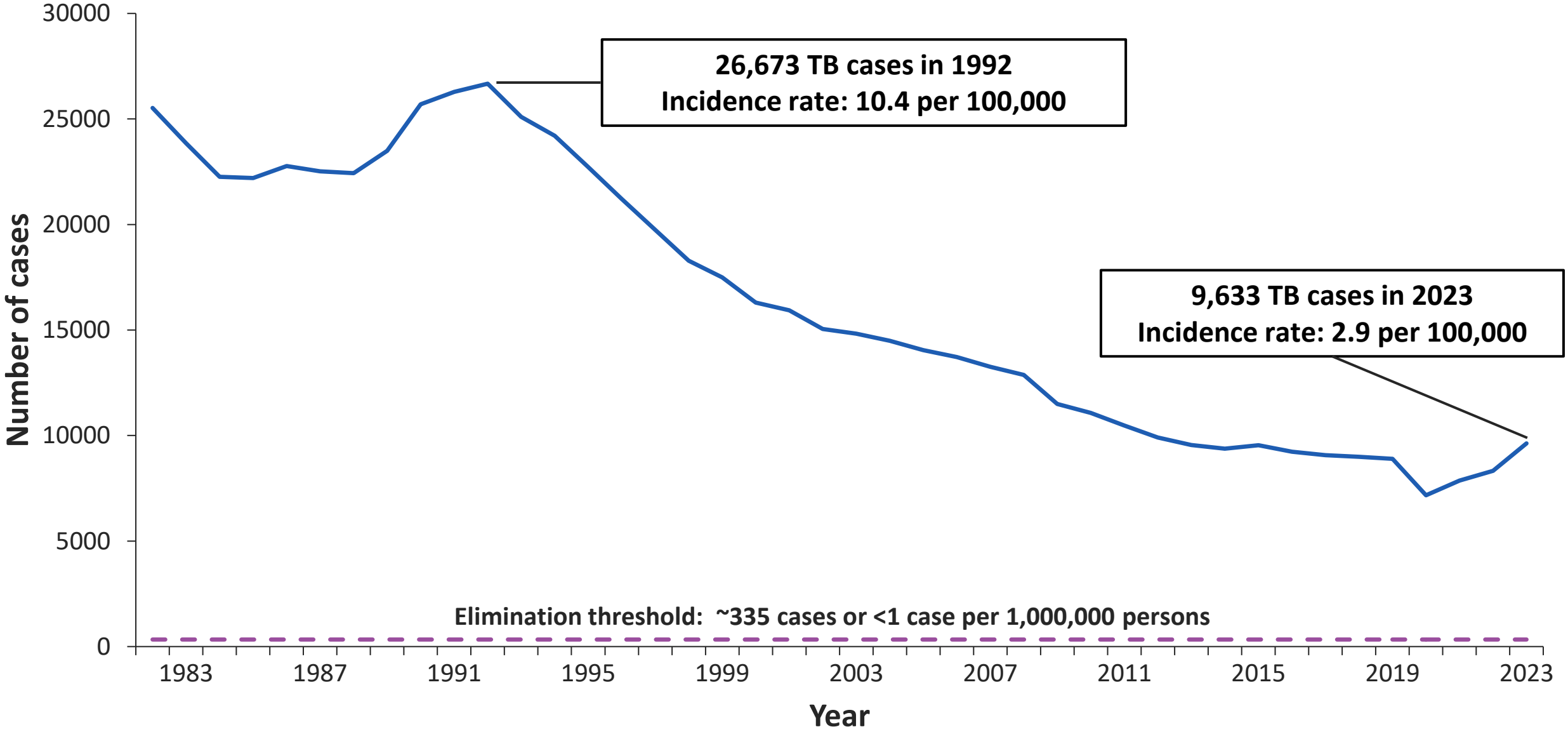
Conducting vigilant surveillance

Researching better diagnostics & treatment options

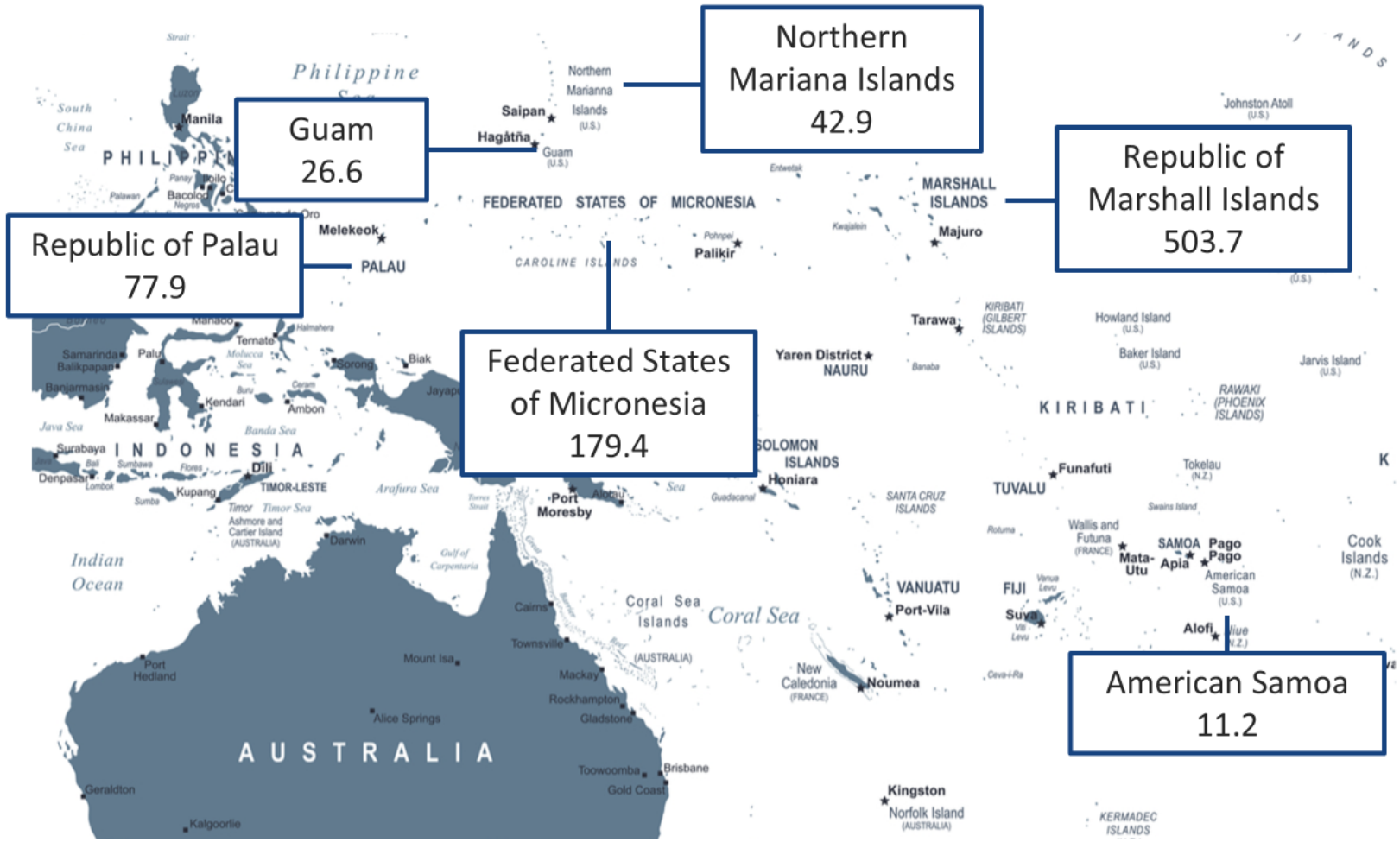
Engaging affected communities & medical providers

Supporting local & state health departments

Progress Towards TB Elimination, United States, 1982–2023

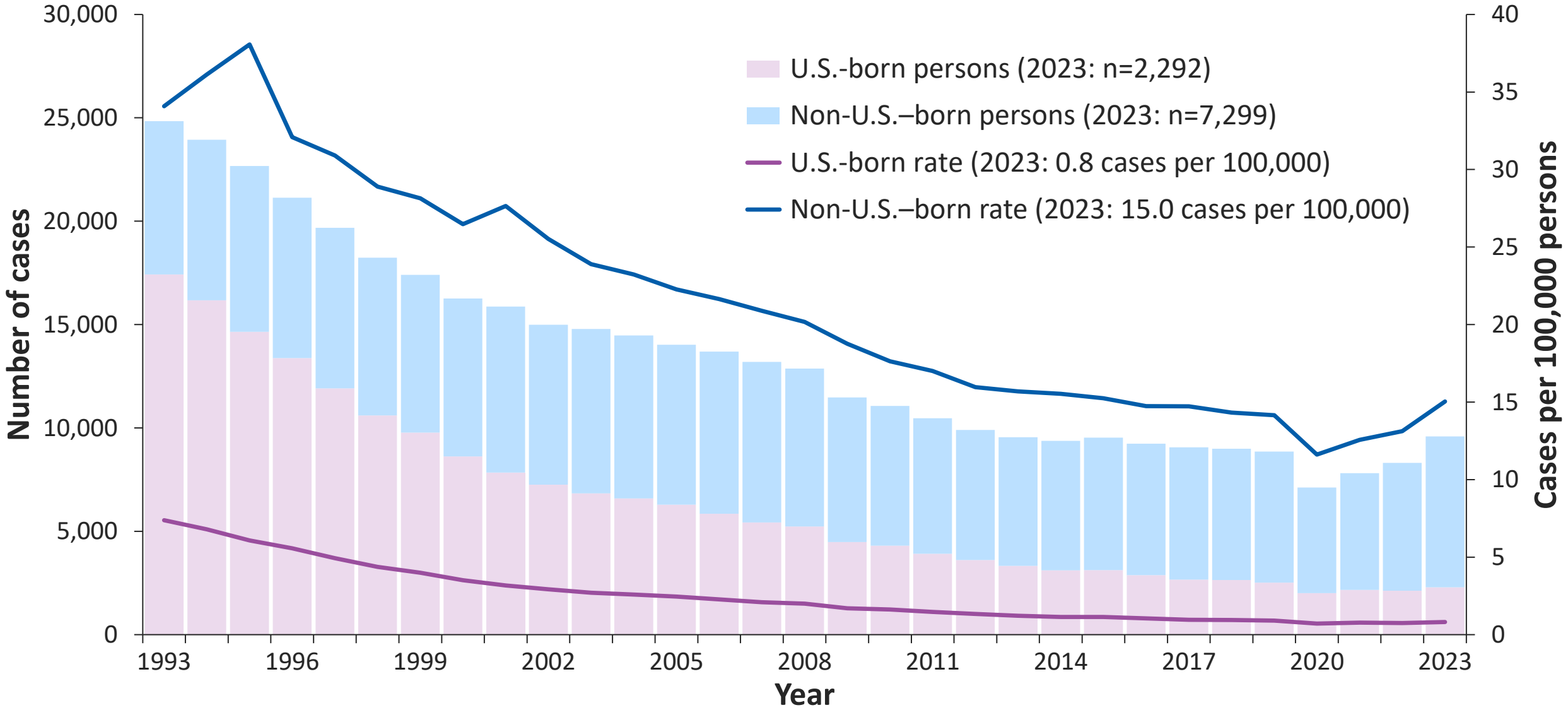


TB Incidence Rates* by U.S.-Affiliated Pacific Islands, 2023



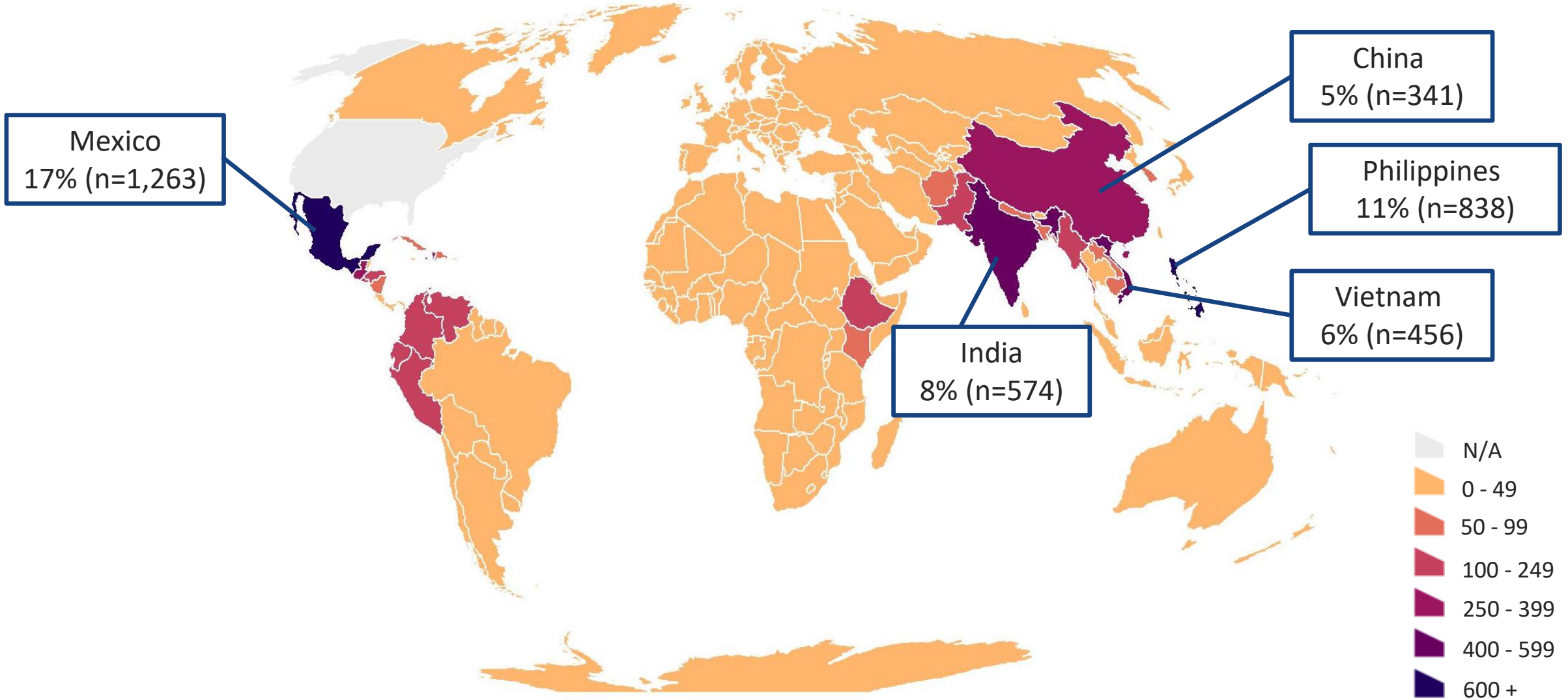
*Cases per 100,000 persons

TB Cases and Incidence Rates by Origin of Birth,* United States, 1993–2023



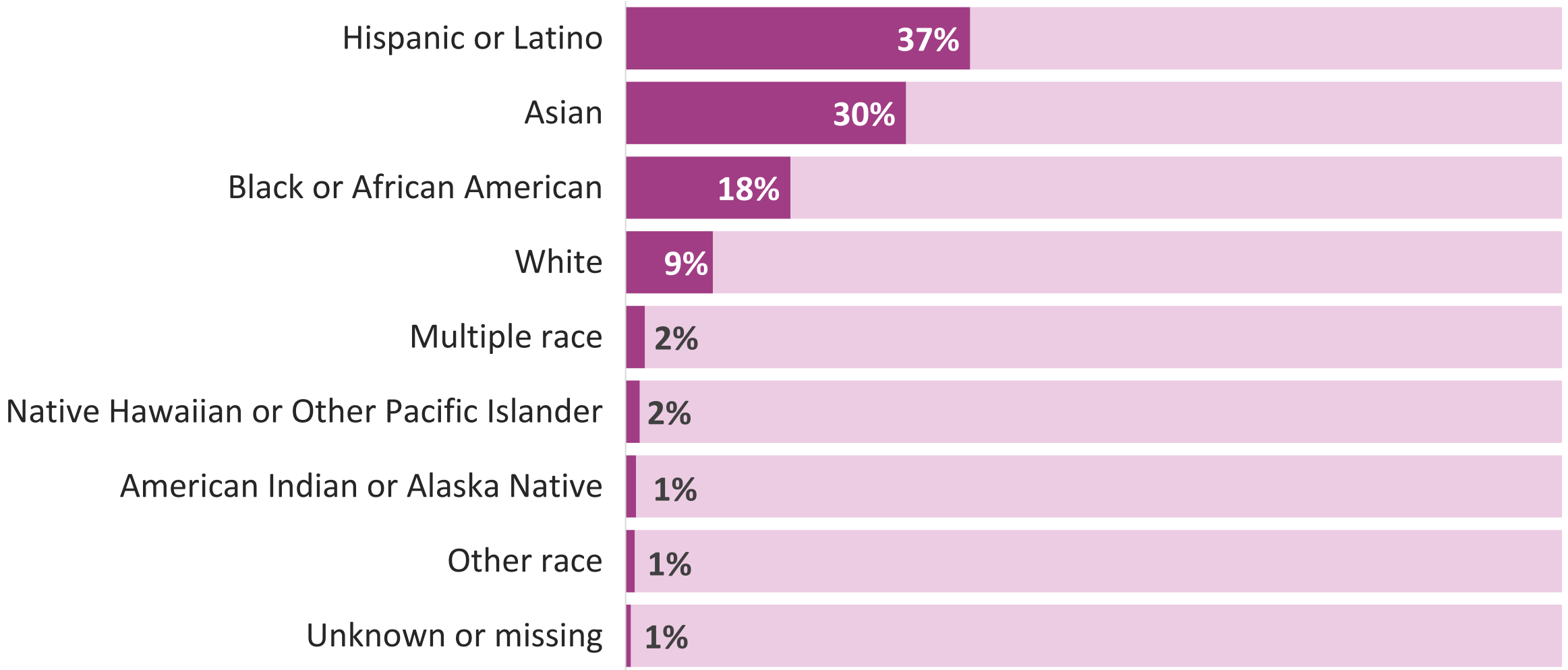
*Persons born in the United States, certain U.S. territories, or elsewhere to at least one U.S. citizen parent are categorized as U.S.-born. All other persons are categorized as non-U.S.–born.

TB Cases by Countries of Birth Among Non-U.S.–Born* Persons, United States, 2023 (N=7,299)



*Persons born in the United States, certain U.S. territories, or elsewhere to at least one U.S. citizen parent are categorized as U.S.-born. All other persons are categorized as non-U.S.–born.

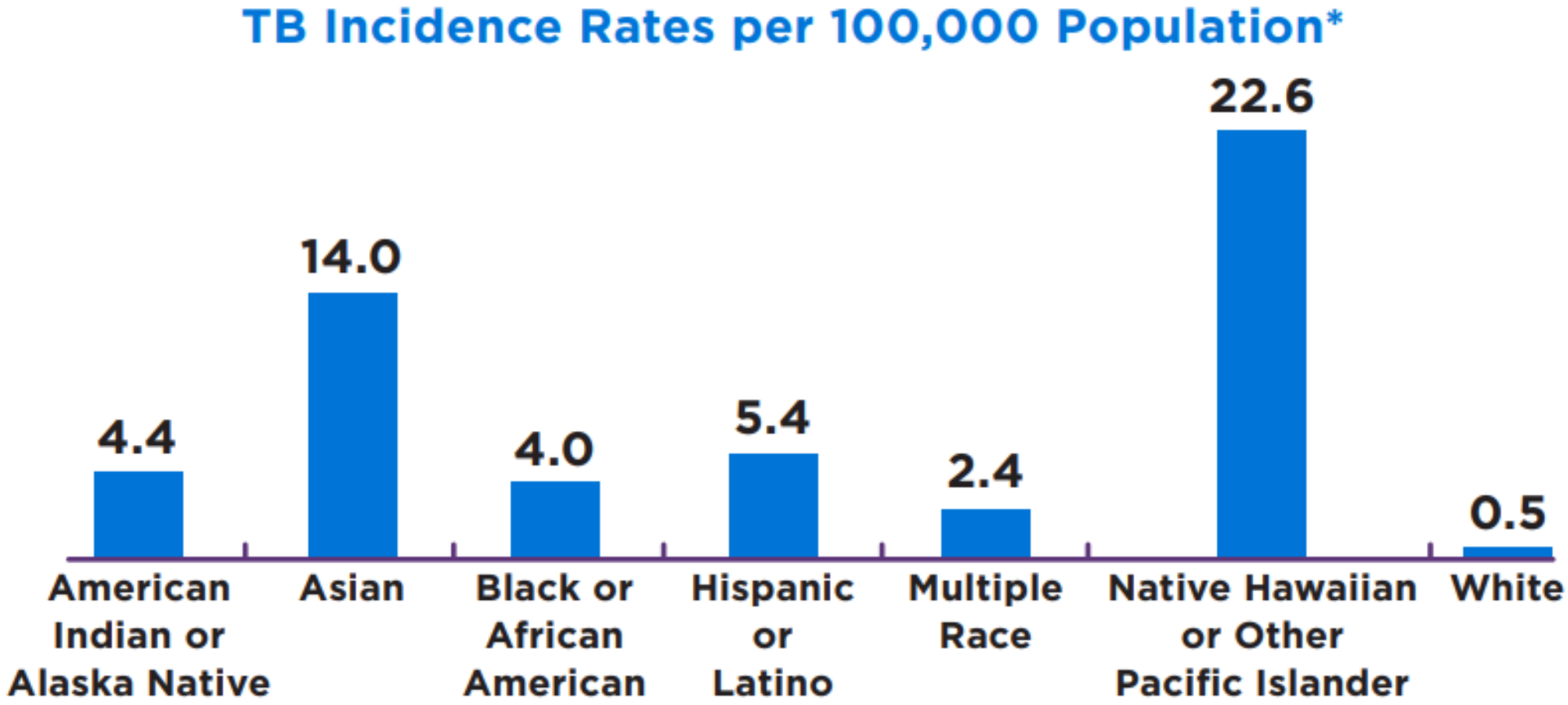
Percentage of TB Cases by Race/Ethnicity,* United States, 2023 (N=9,633)



*Persons who identified as Hispanic or Latino were categorized as "Hispanic," regardless of self-reported race. Persons who did not identify as Hispanic or Latino were categorized by self-reported race; if more than one race was reported, the person was categorized as "Multiple race."

Note: The increase in numbers and percentages of persons identified as "Multiple race" might be related to changes in processing and transmission of race data for 2023 cases as compared to previous years.

Racial and ethnic disparities in TB diagnoses continue to exist.



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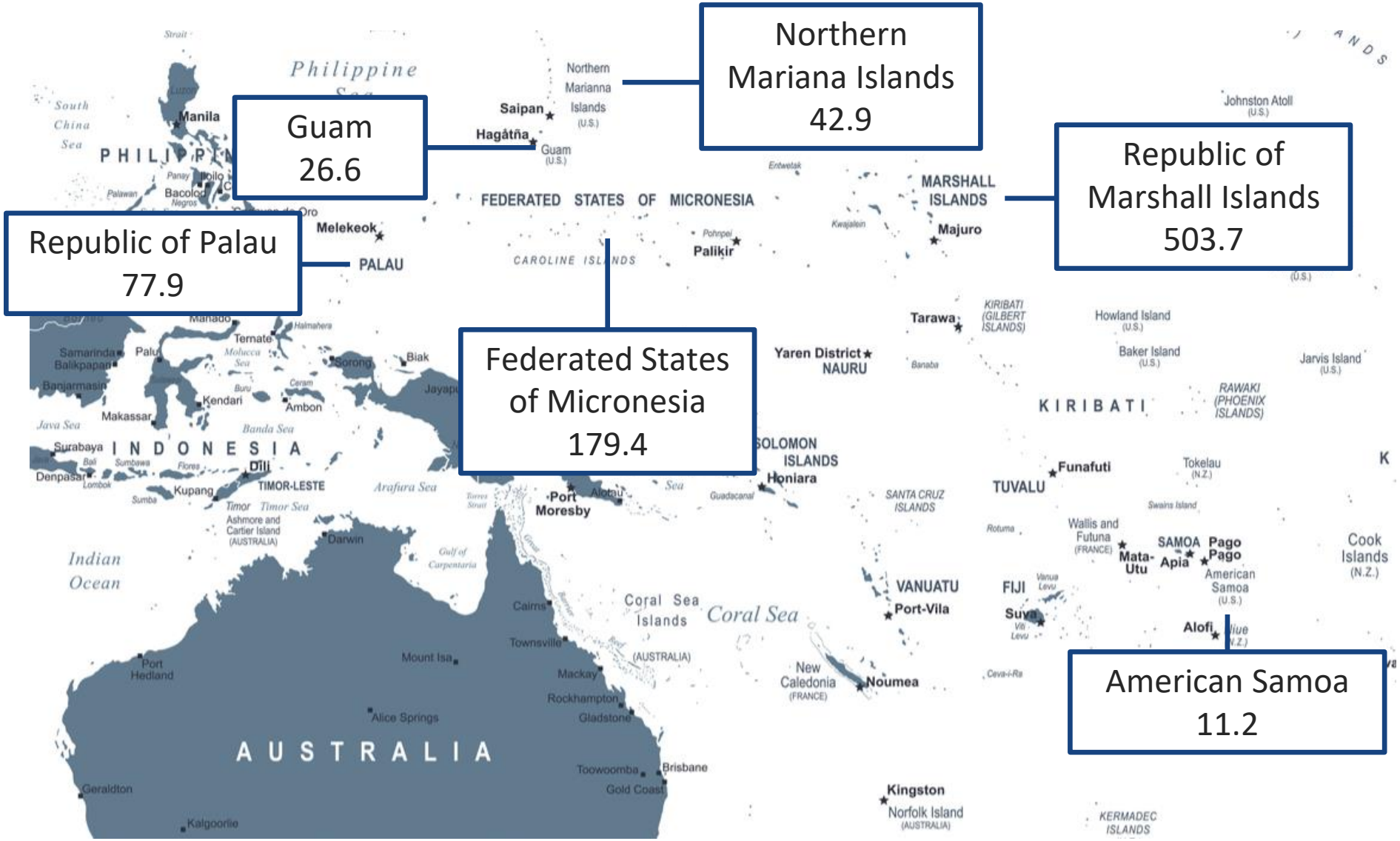
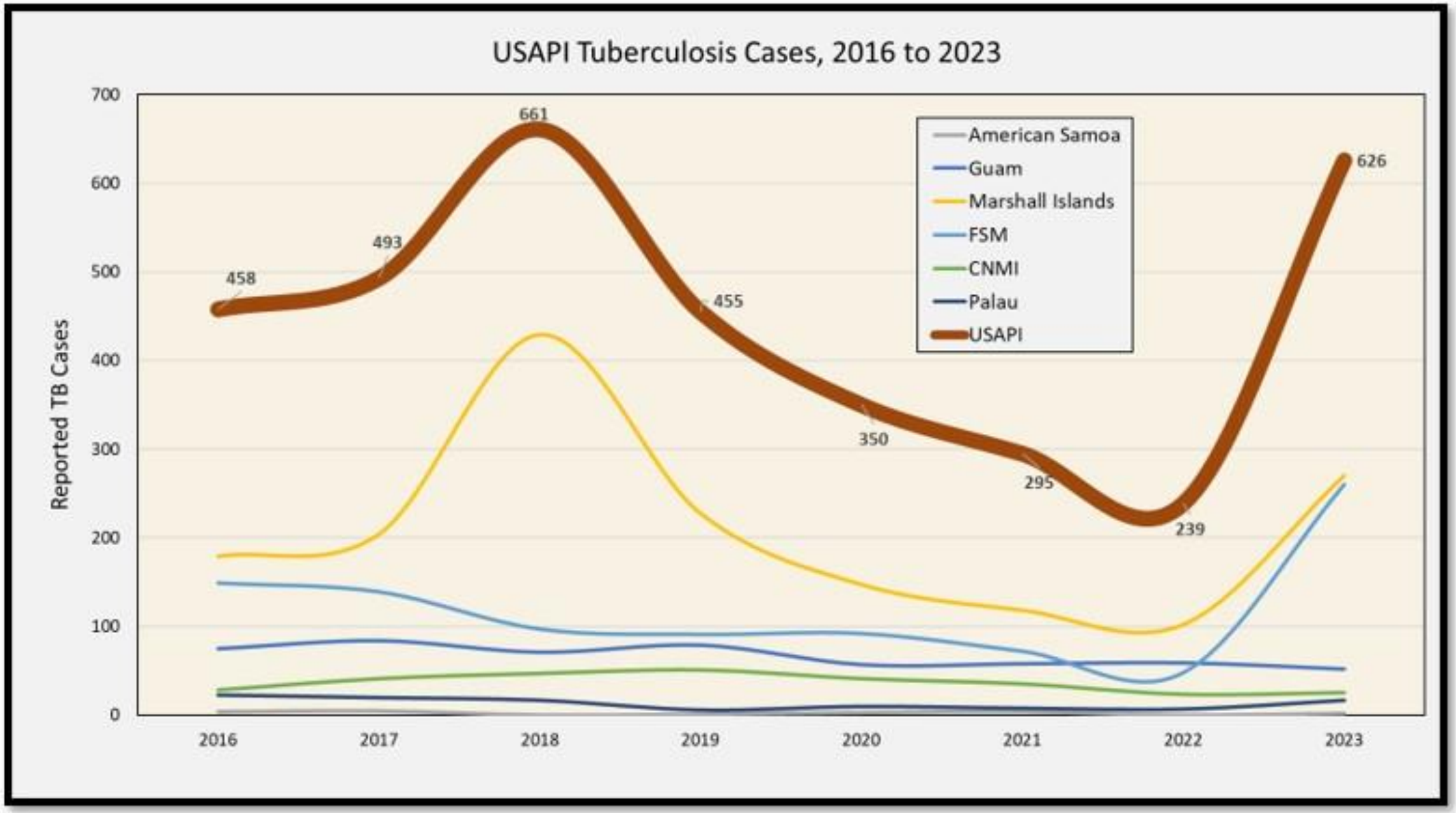
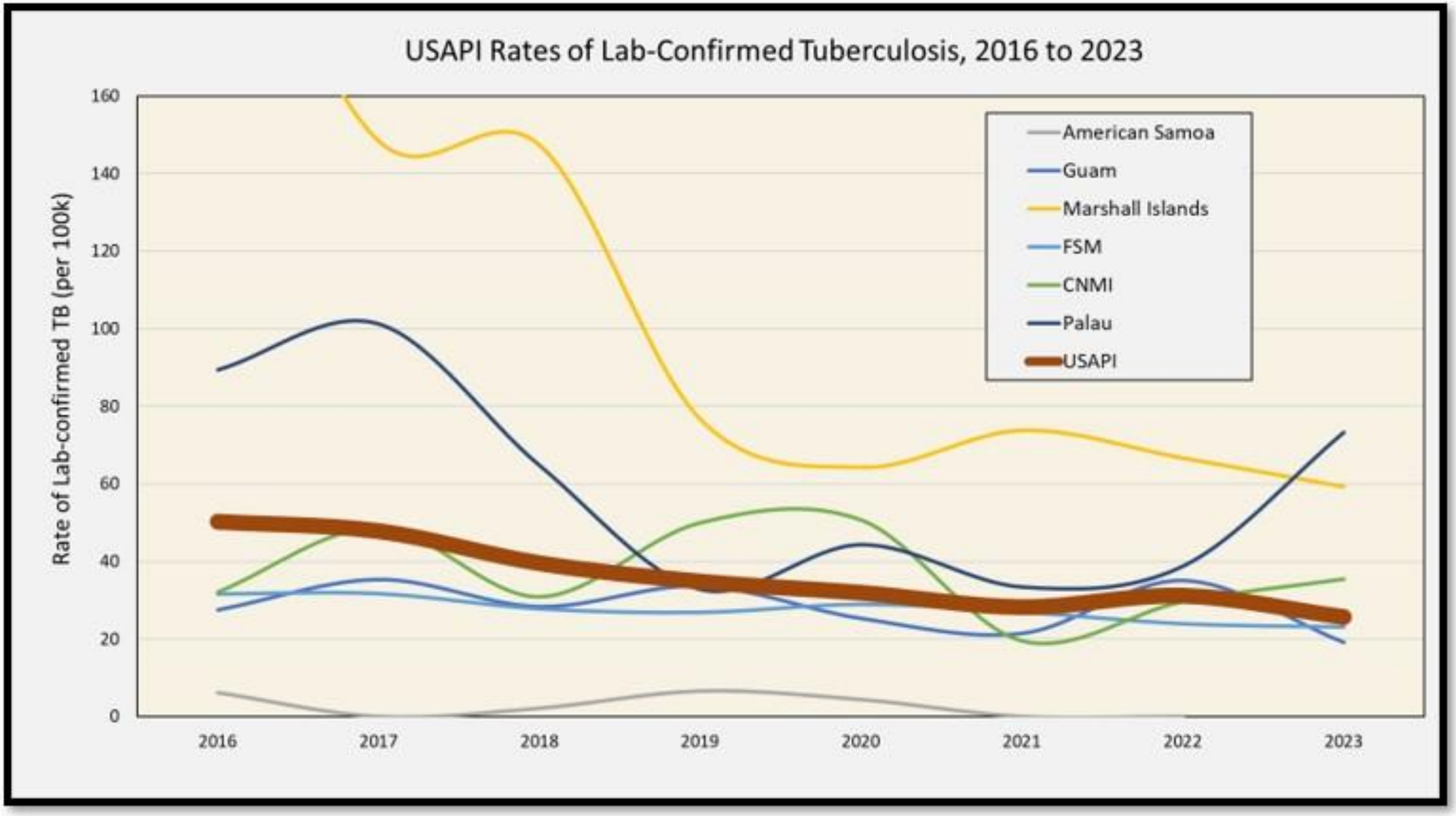
TB Incidence Rates* by U.S.-Affiliated Pacific Islands, 2023



*Cases per 100,000 persons


USAPI Tuberculosis Cases, 2016 to 2023
Reported TB Cases
700
600
500
400
300
200
100
0
2016
2017
2018
2019
2020
2021
2022
2023
458
493
661
455
350
295
239
626
American Samoa
Guam
Marshall Islands
FSM
CNMI
Palau
USAPI

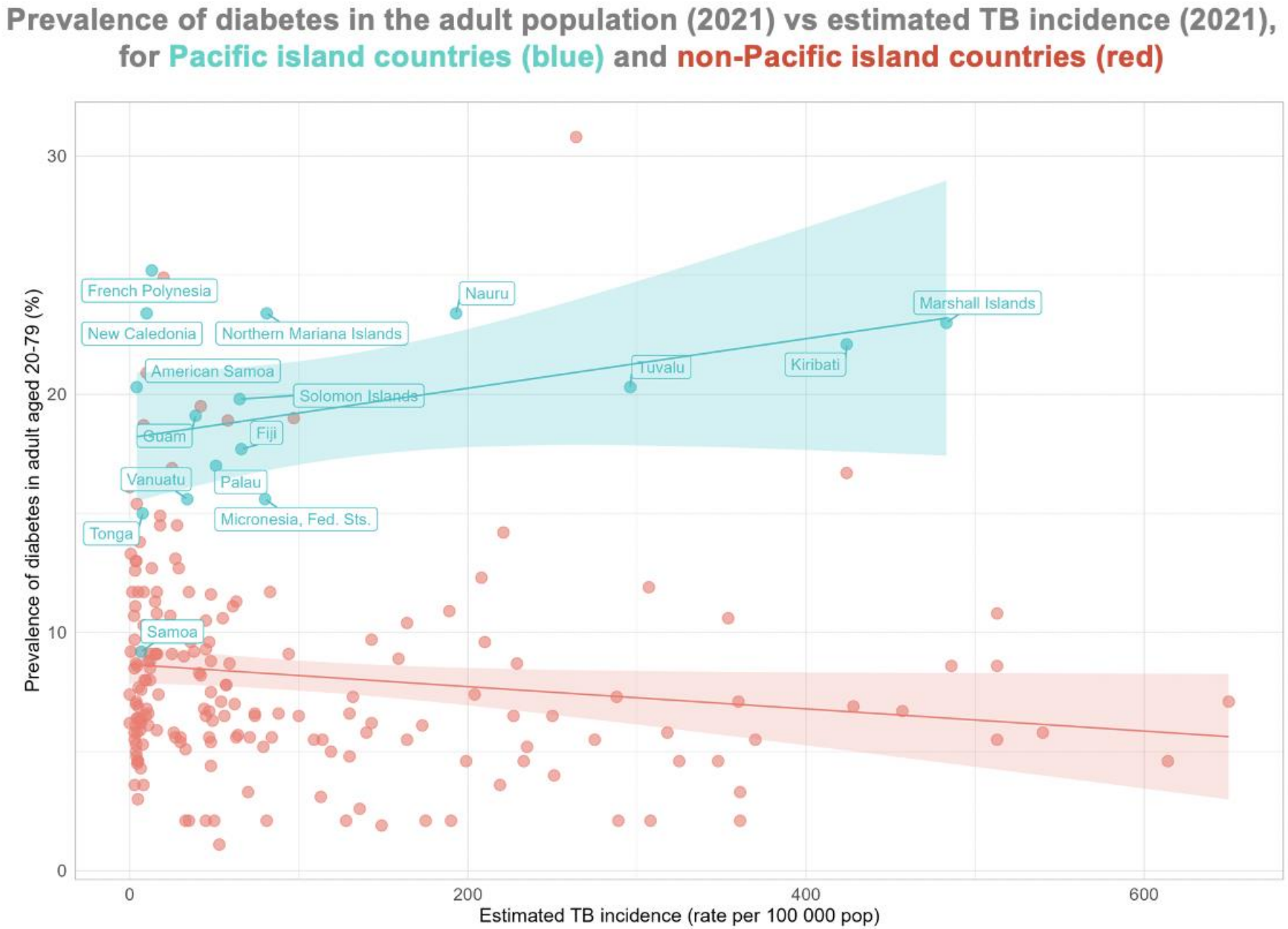

USAPI Rates of Lab-Confirmed Tuberculosis, 2016 to 2023
Rate of Lab-confirmed TB (per 100k)
160
140
120
100
80
60
40
20
0
2016
2017
2018
2019
2020
2021
2022
2023
American Samoa
Guam
Marshall Islands
FSM
CNMI
Palau
USAPI

Groups of countries and areas based on estimated rate of TB incidence in 2021

World Health Organization
Western Pacific Region

Estimated TB incidence (per 100k)	>500	300-499	100-299	50-99	10-49	<10
Grouping	Severely endemic	Highly endemic	Endemic	Upper moderate	Lower moderate	Low incidence
Countries and territories	N/A Marshall Isl	Marshall Islands Kiribati	Tuvalu Nauru FSM	Tokelau Northern Mariana Islands Micronesia (Federated States of) Fiji Solomon Islands Palau	Niue Guam Vanuatu French Polynesia Cook Islands New Caledonia Tonga CNNMI Am Samoa	Samoa American Samoa Wallis and Futuna

2023 incidence



Data source of DM prevalence: International Diabetes Federation

In the RMI (and in PIC's)-TB and Diabetes represent a dual pandemic.

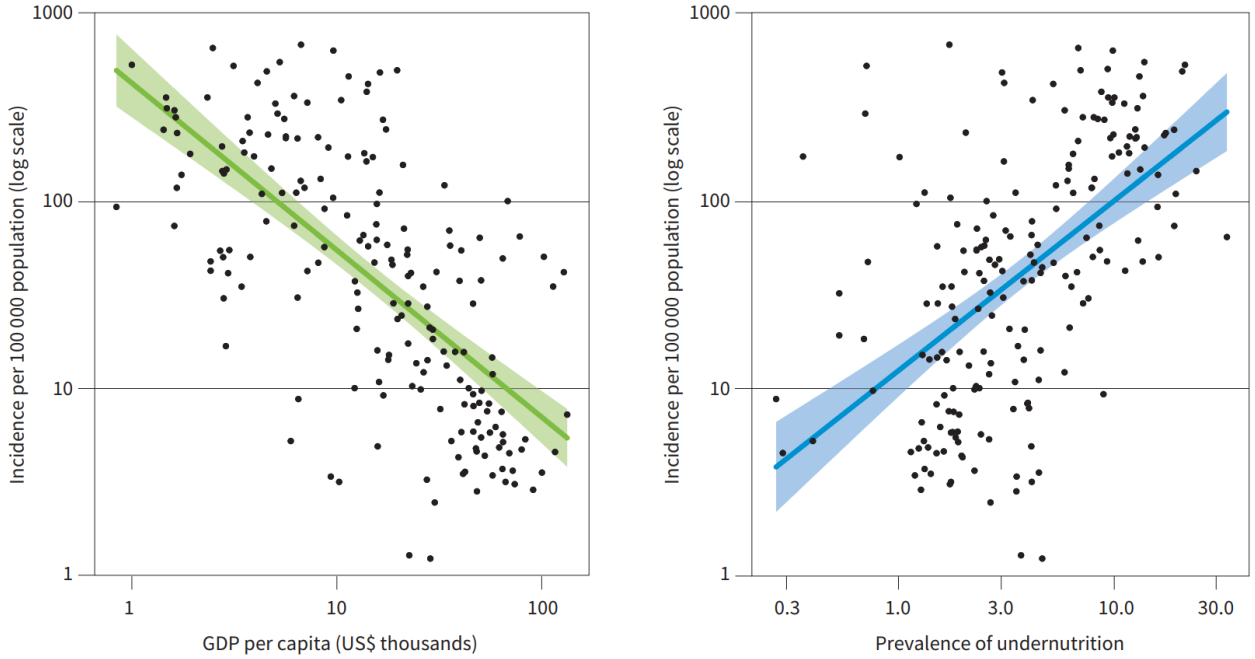
A person with TB infection and diabetes is 2-3 times more likely to develop Tuberculosis –disease.

Diabetes is a driver of TB, especially in the middle aged and elderly population.

TB as a social disease

The relationship between two SDG-related indicators and TB incidence per 100 000 population,[a,b] 2023

Each dot represents a country or area.



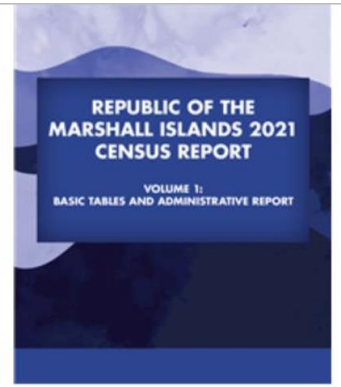
[a] The year of data used for GDP per capita and the population prevalence of undernutrition is the latest year for which data are available from the World Bank (https://data.worldbank.org/) and the WHO Global Health Observatory (https://www.who.int/data/gho), respectively.

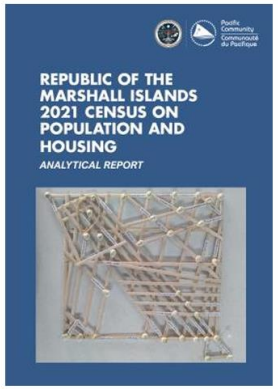
[b] Undernutrition is defined as a low body mass index for people aged ≥5 years. The prevalence of undernutrition in the figure is the percentage of people aged ≥18 years with a body mass index <18.5.

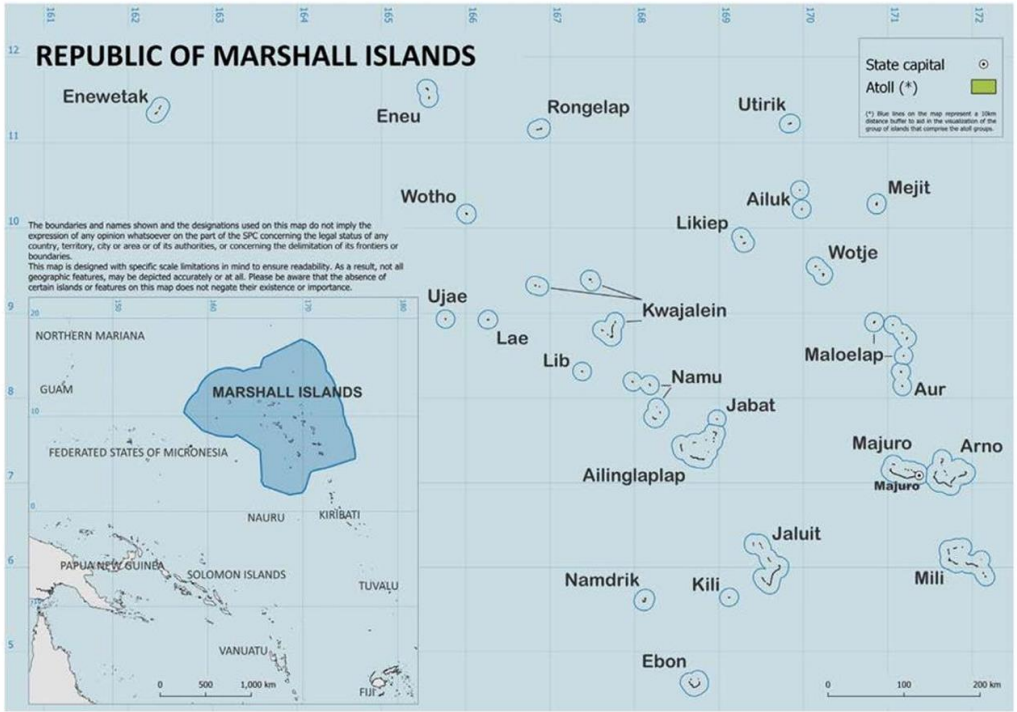
Drivers of TB in the RMI

Drivers of TB Infection	Drivers of TB Disease
Infectious cases in the community (not on treatment)	Diabetes
Housing: overcrowding (high population density)	Poor nutrition/ malnutrition
Smoking	Smoking
Diagnostic delay	Stress
Cough etiquette	Cancer / immunosuppression

Marshall Islands-Demographics







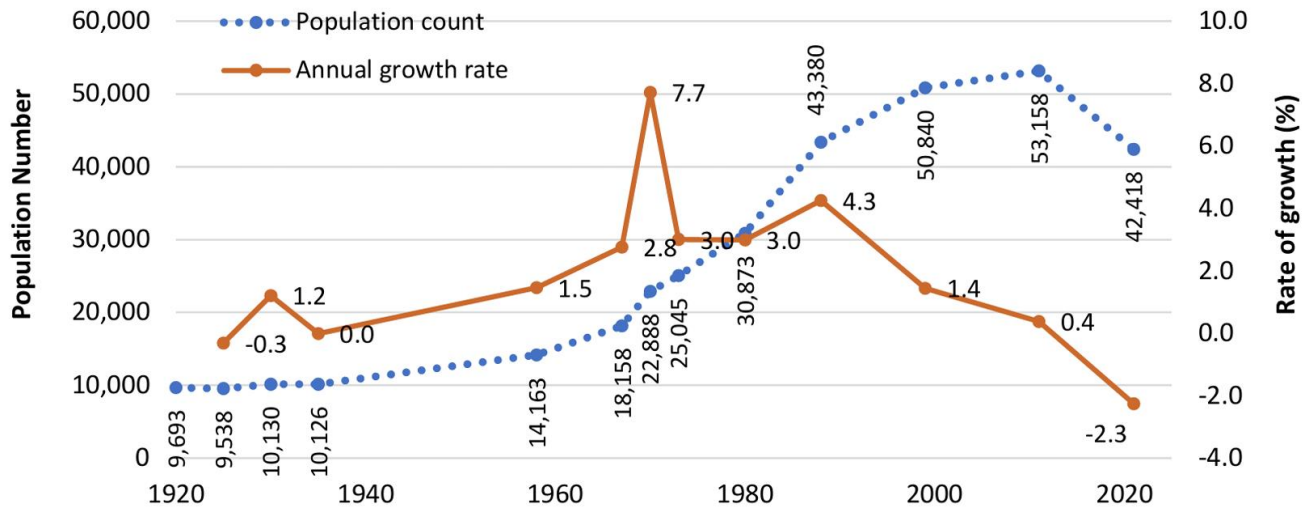
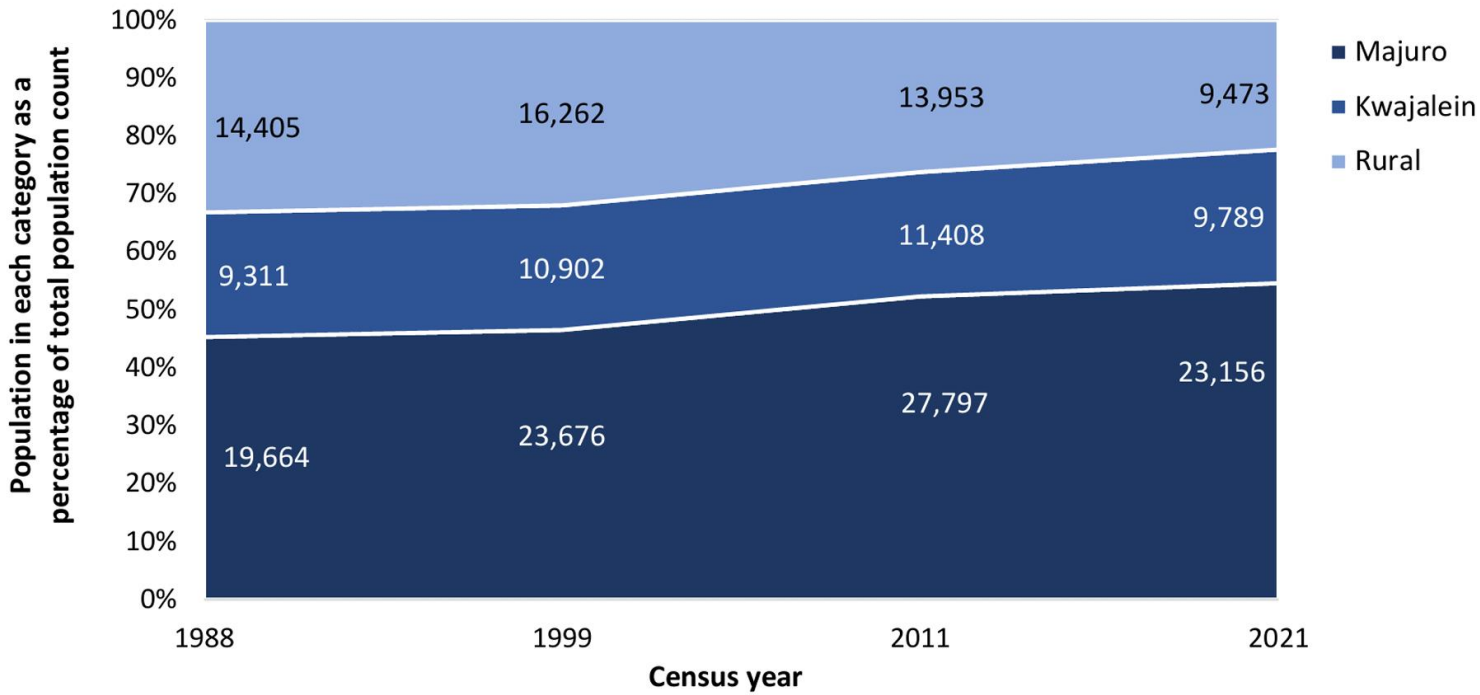


Figure 2.1. *Population of RMI, 1920–2021*



RMI 2021 Census Analytical Report

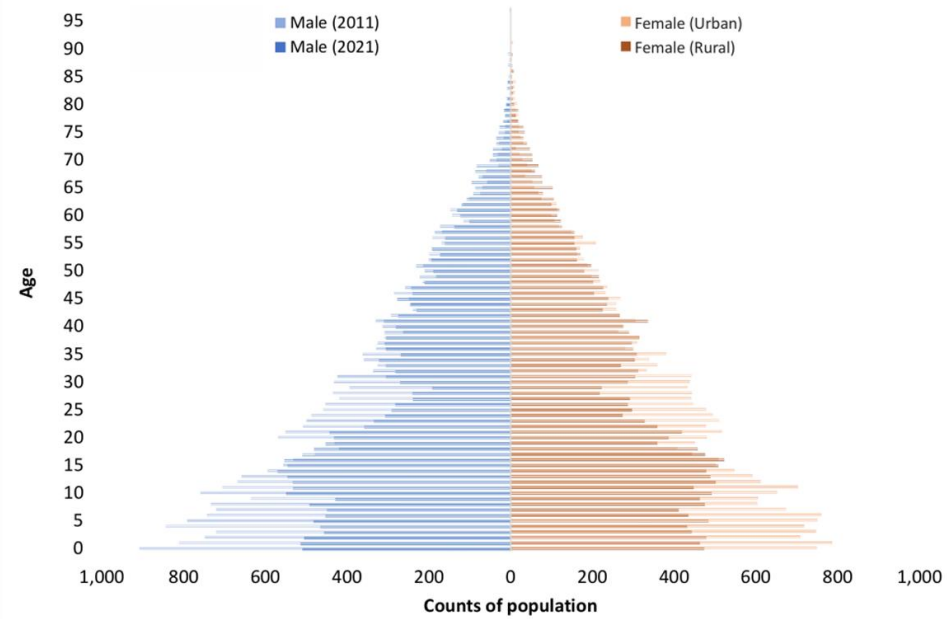
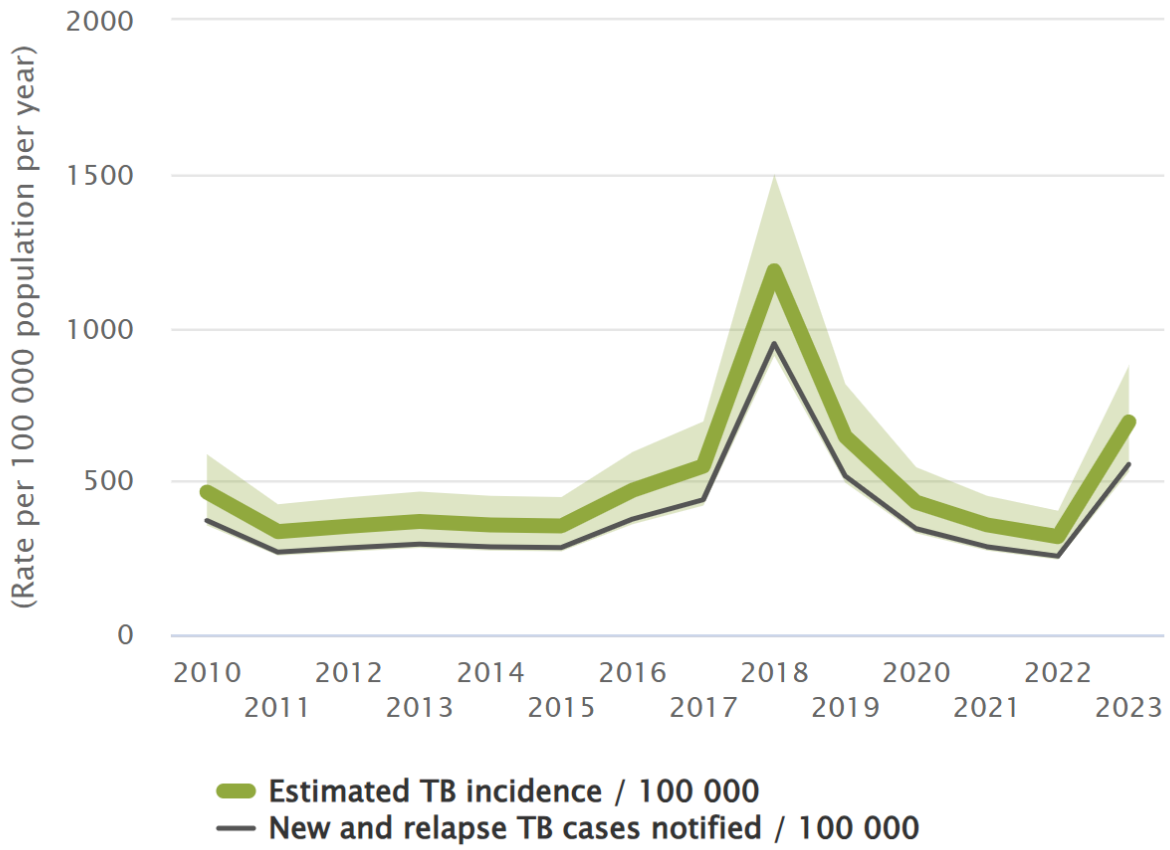


Figure 2.3. *Population by age and sex, RMI, 2011 and 2021*

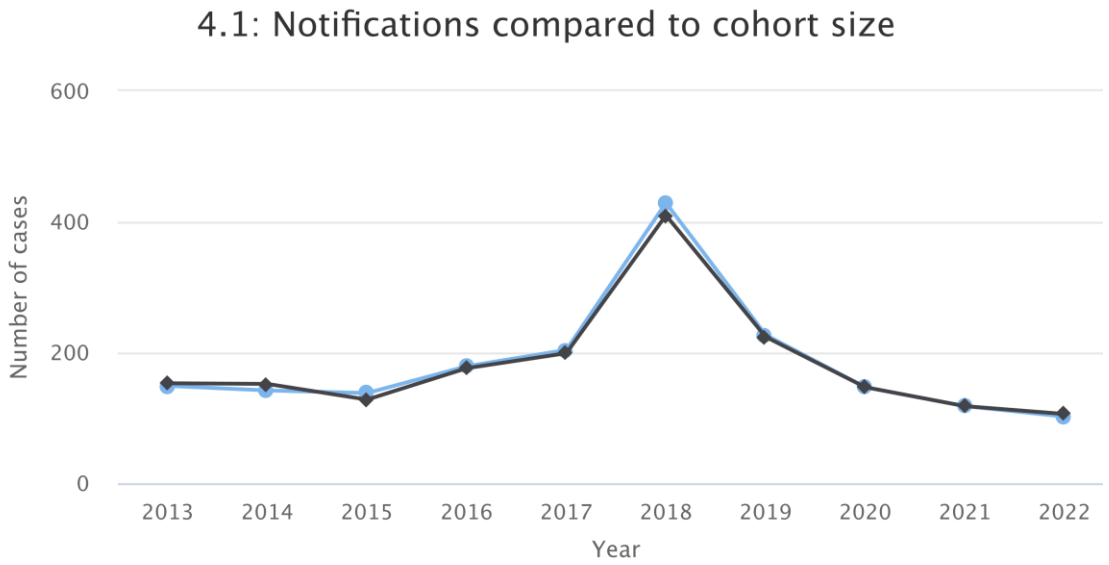
Epidemiology of TB in the RMI

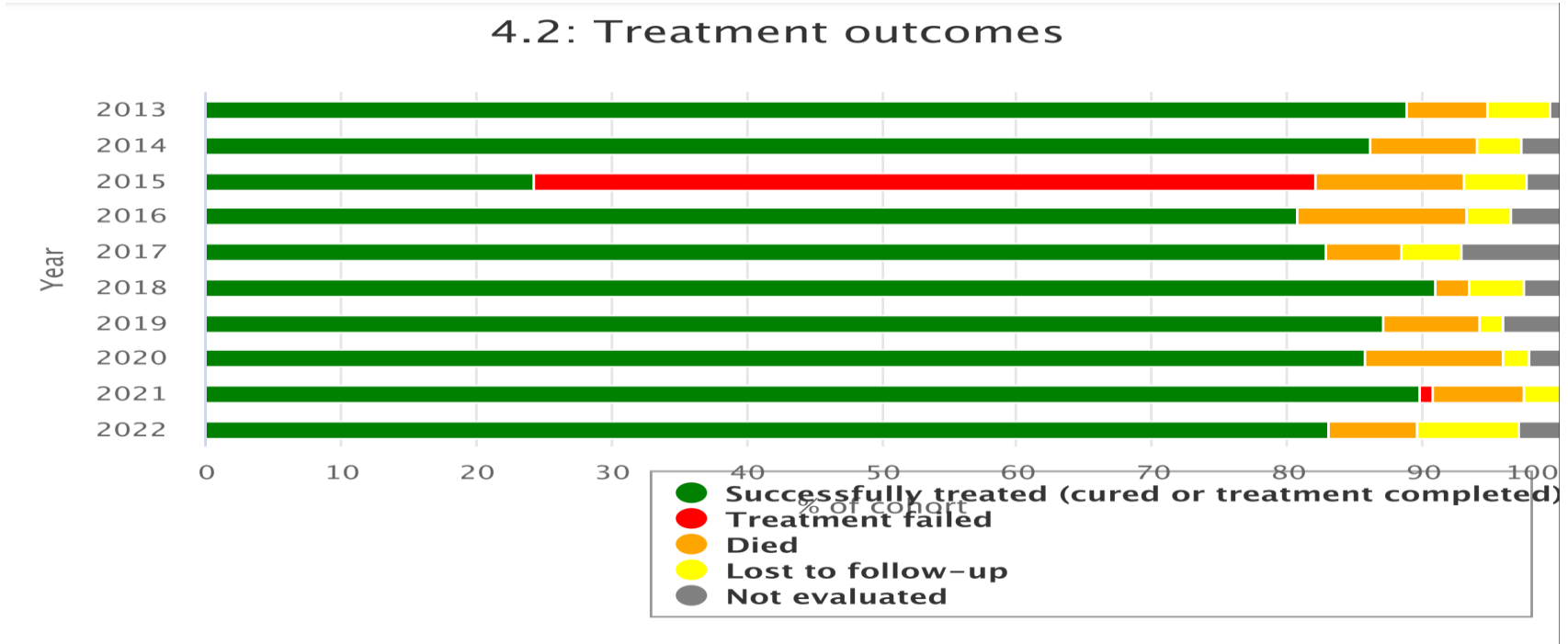


In the RMI in 2023, the estimated incidence of TB was 672 cases per 100,000 population.

The estimated number of people with TB was 270 (210-340). Of these, 215 new cases were diagnosed/notified. Treatment coverage 80%

Significant population decline.


4.1: Notifications compared to cohort size
600
400
200
0
Number of cases
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
Year

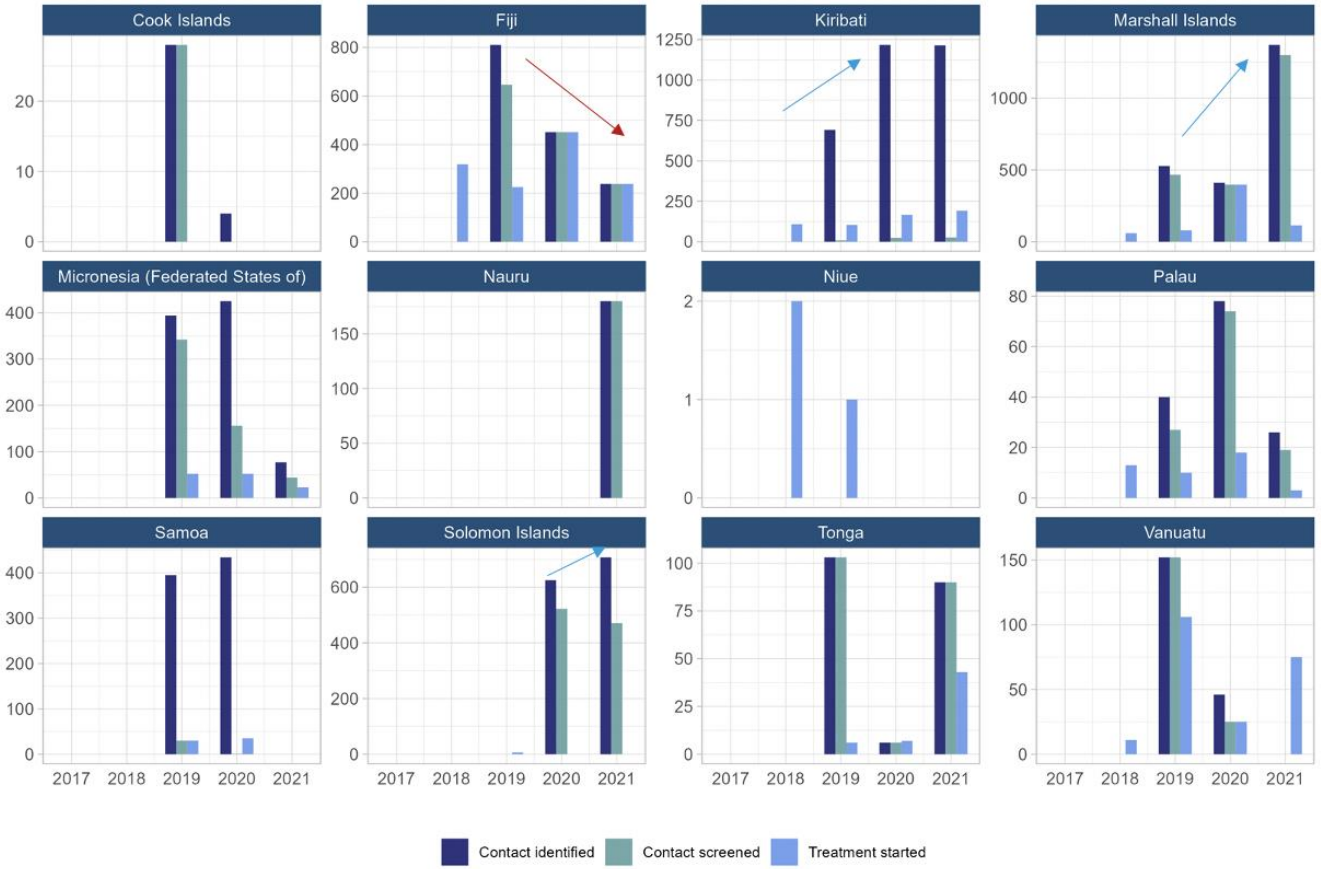

4.2: Treatment outcomes
Year
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
0
10
20
30
40
50
60
70
80
90
100
% of cohort
Successfully treated (cured or treatment completed)
Treatment failed
Died
Lost to follow-up
Not evaluated

Preventative treatment: Latent TB Infection.

TB preventive treatment

World Health Organization
Western Pacific Region

The number of household contact identified, screened, and started on TB preventive treatment by country, 2017-2021



Trend varies by country

- Increasing trend in contact identified in Kiribati, Marshall Islands, and Solomon Islands
- Decreasing trend in Fiji
- Initiation of TPT suboptimal in the majority of the countries

Active Case Finding: TB Mass Screening: Ebeye & Majuro-IMPACTS

International Journal of Epidemiology, 2022, 1–13
https://doi.org/10.1093/ije/dyac045
Original article

Original article

Estimating the long-term effects of mass screening for latent and active tuberculosis in the Marshall Islands

Romain Ragonnet ,[1]* Bridget M Williams,[1] Angela Largen,[2] Joaquin Nasa Jr,[3] Tom Jack,[3] Mailynn K Langinlur,[3] Eunyoung Ko,[4] Kalpeshsinh Rahevar,[5] Tauhid Islam,[5] Justin T Denholm,[6] Ben J Marais,[7] Guy B Marks,[8] Emma S McBryde[9] and James M Trauer[1]

Key Messages

- The community-wide active case-finding interventions conducted in the Marshall Islands in 2017 and 2018 will cause significant tuberculosis (TB) incidence and mortality reductions over the following decades.
- These reductions will be considerably more significant in the regions that included latent TB infection screening in their programme.
- TB pre-elimination could be achieved by 2040 in the Marshall Islands through periodic repetition of the same interventions as those already implemented in the country.
- It is possible to rapidly drive TB towards elimination in high-TB-burden settings using currently available TB control tools.
- This can be achieved with ambitious interventions that target latent TB infection in addition to active TB.

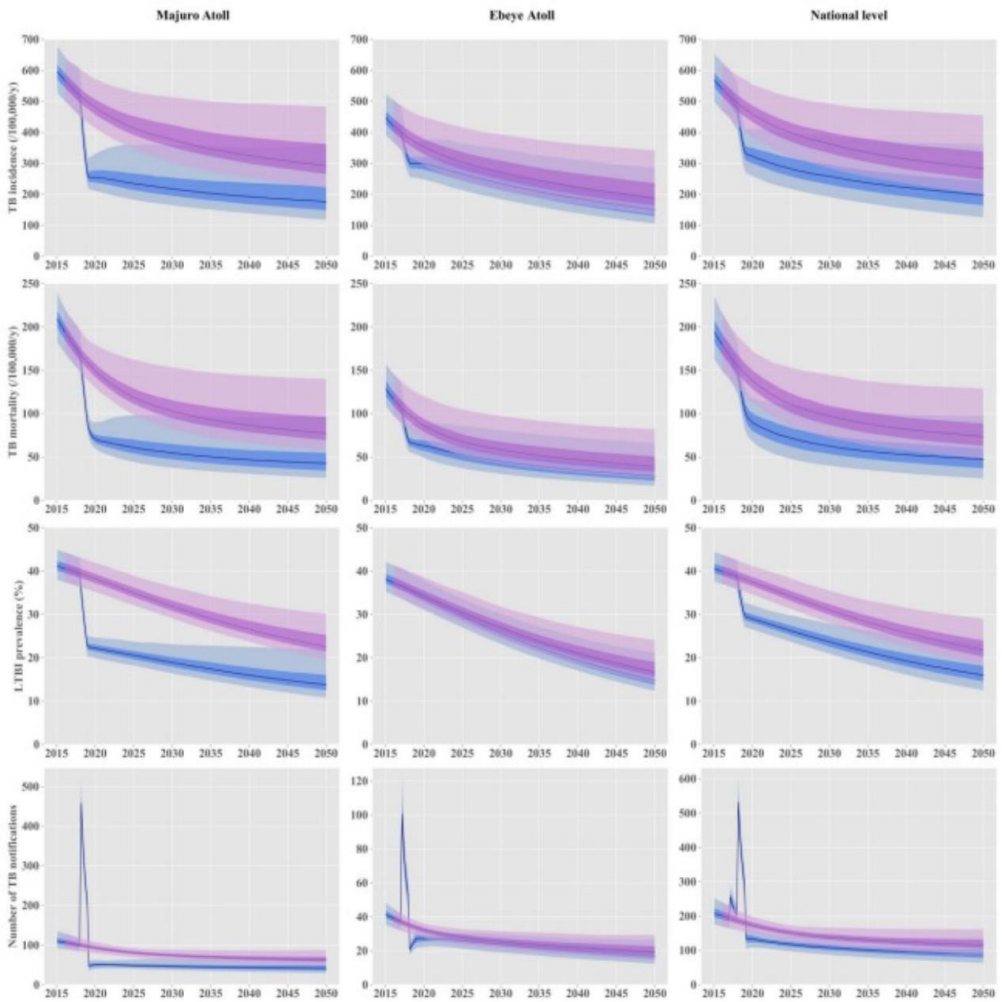


Figure 3 Projected effect of the active screening interventions implemented in 2017 and 2018. The solid lines represent the median estimates. The shaded areas show the interquartile credible intervals (dark shade) and 95% credible intervals (light shade) projected in the absence of any intervention (pink) and under a scenario including the interventions implemented in 2017-18 in Majuro and Ebeye (blue). TB, tuberculosis; LTBI, latent tuberculosis infection

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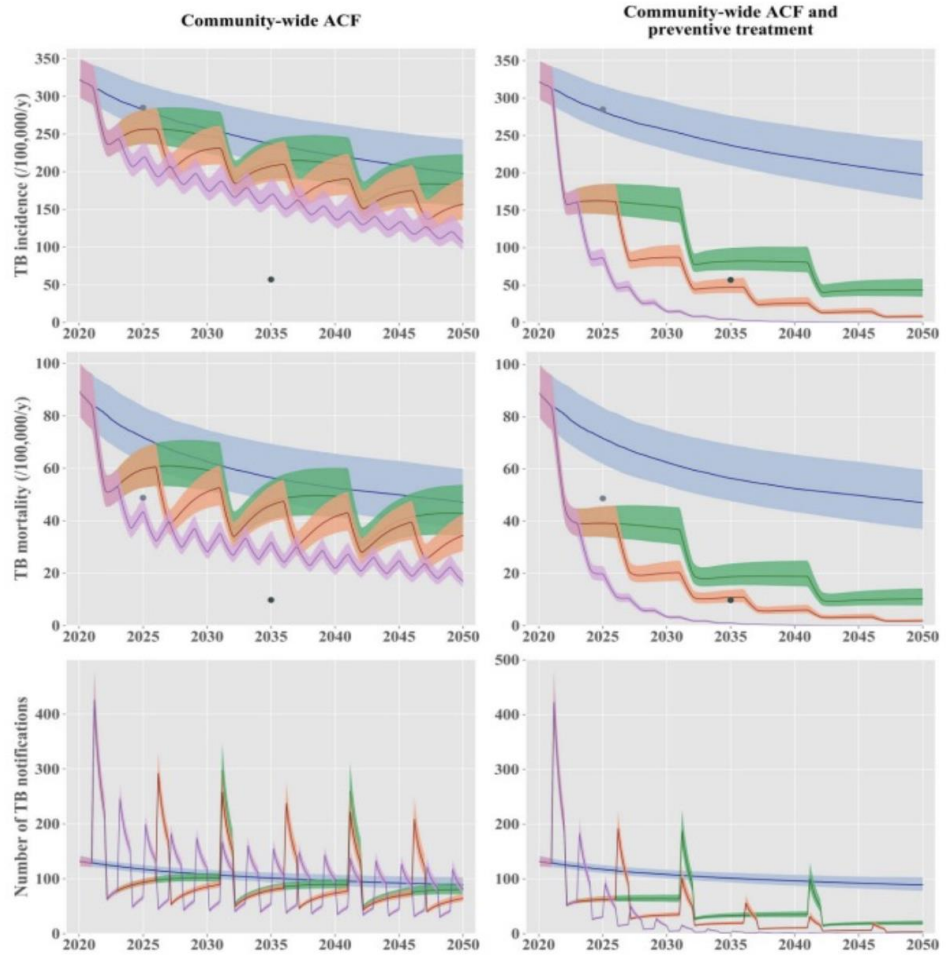

Figure 4 Projected effect of periodic community-wide interventions. The solid lines represent the median estimates, and the shaded areas show the interquartile credible intervals. The 'status-quo' scenario is represented in blue in all panels. The left column of panels presents scenarios including nationwide active case finding (ACF) repeated every 2 years (purple) or every 5 years (orange) or every 10 years (green). The right column of panels presents nationwide ACF scenarios combined with mass latent infection screening and treatment, repeated every 2 years (purple) or 5 years (red). The light and dark grey dots show the 2025 milestones and the 2035 targets, respectively, according to the End TB Strategy. TB, tuberculosis; ACF, active case finding

Modeling studies based on projected TB incidence post mass screening in 2017 & 2018, indicate significant declines in incidence, which will need to be repeated periodically to significantly make progress towards elimination.