



The Epidemiology of Tuberculosis in Minnesota 2018 – 2022

Minnesota Department of Health

Tuberculosis Prevention and Control Program

(651) 201-5414 | www.health.state.mn.us/tb

TB Morbidity and Mortality Minnesota, 2018-2022

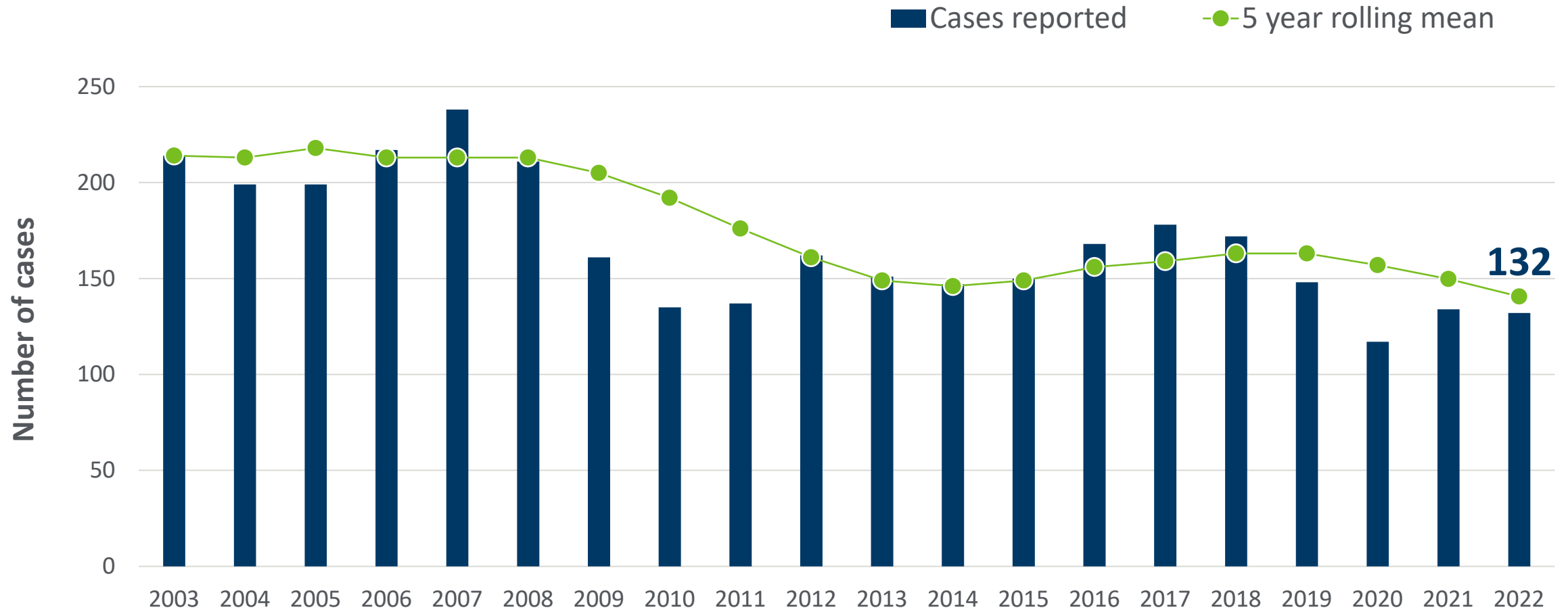
as of September 29, 2023

Year	No. of New Cases (Rate)*	No. of TB Deaths (% of New Cases)**
2018	172 (3.1)	2 (1)
2019	148 (2.6)	7 (5)
2020	117 (2.1)	6 (5)
2021	134 (2.4)	11 (8)
2022	132 (2.3)	8 (6)

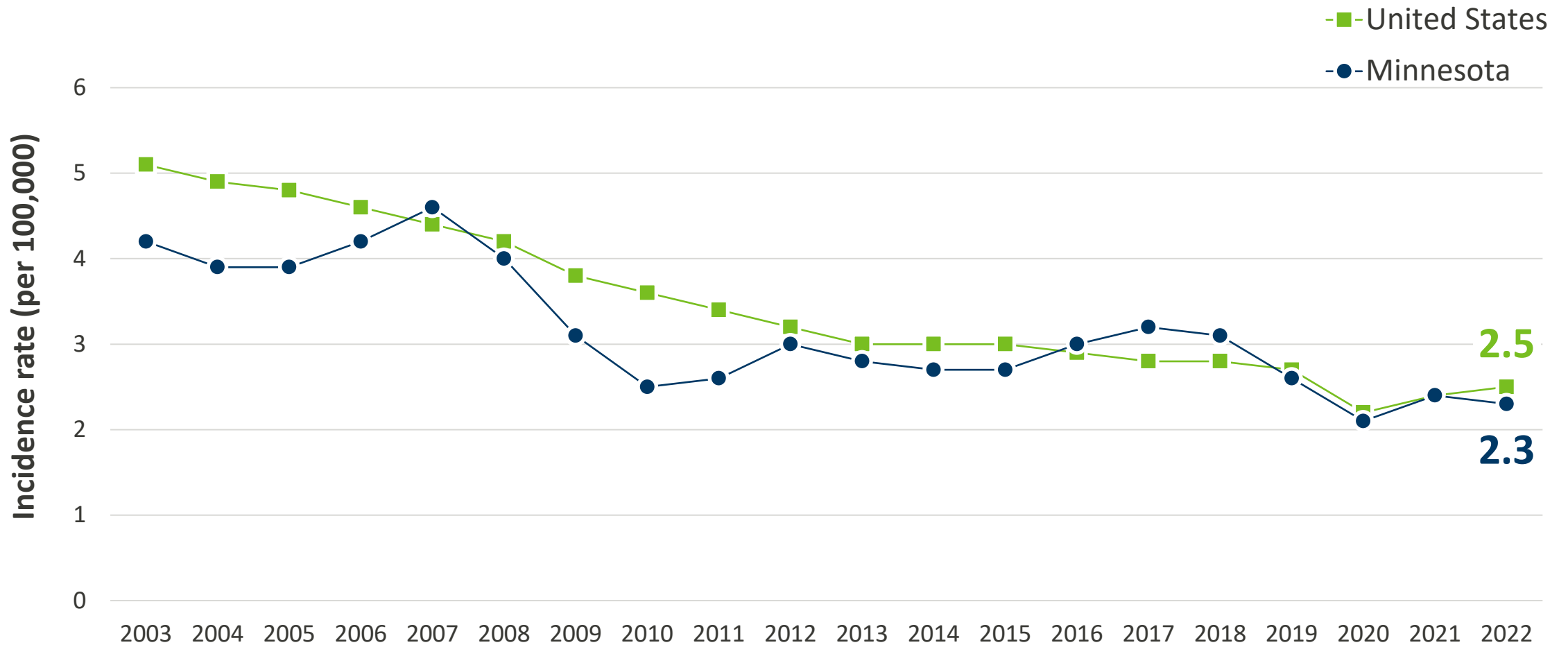
* Cases per 100,000 population. Rates calculated using state population estimates from the U.S. Census Bureau.

** Represents only deaths due to TB disease or TB drug-induced toxicity; percentages based on the number of new TB cases for each year

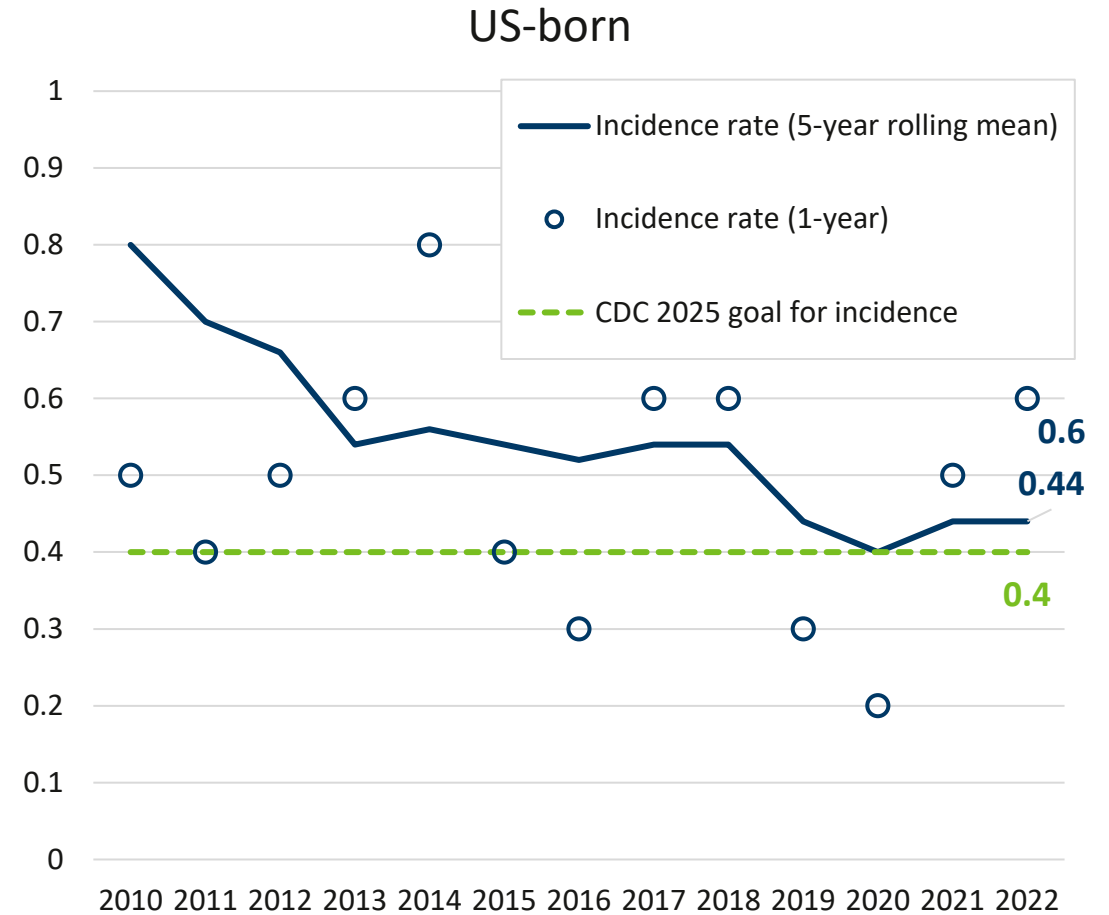
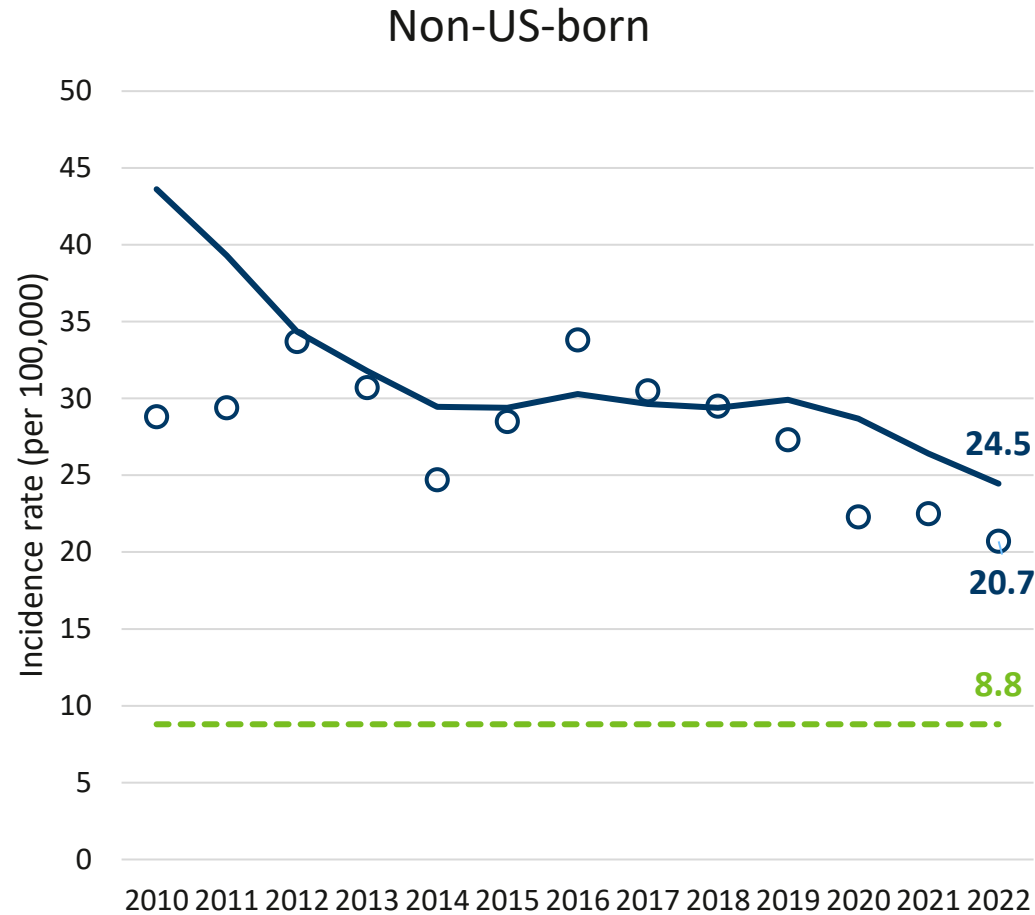
Active TB Cases Reported Annually Minnesota, 2003-2022



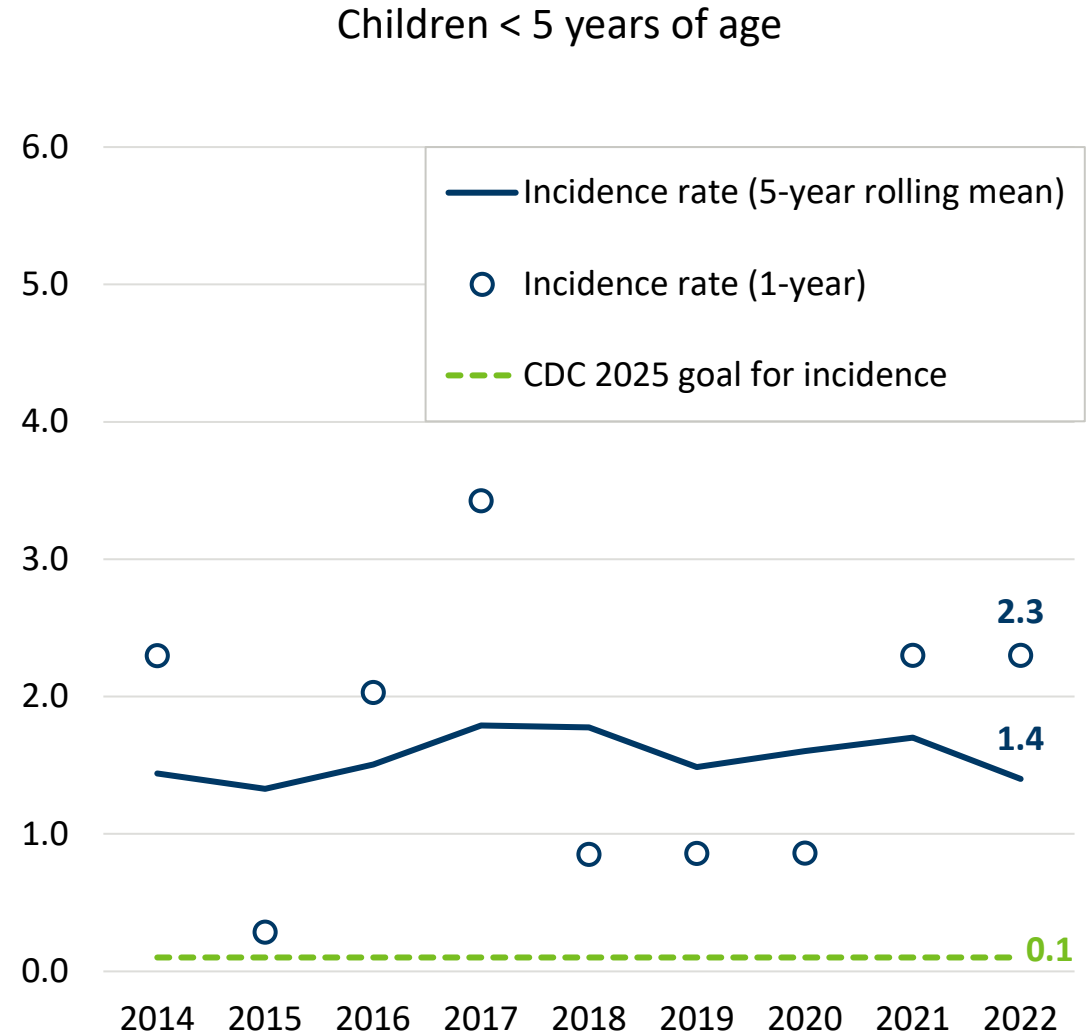
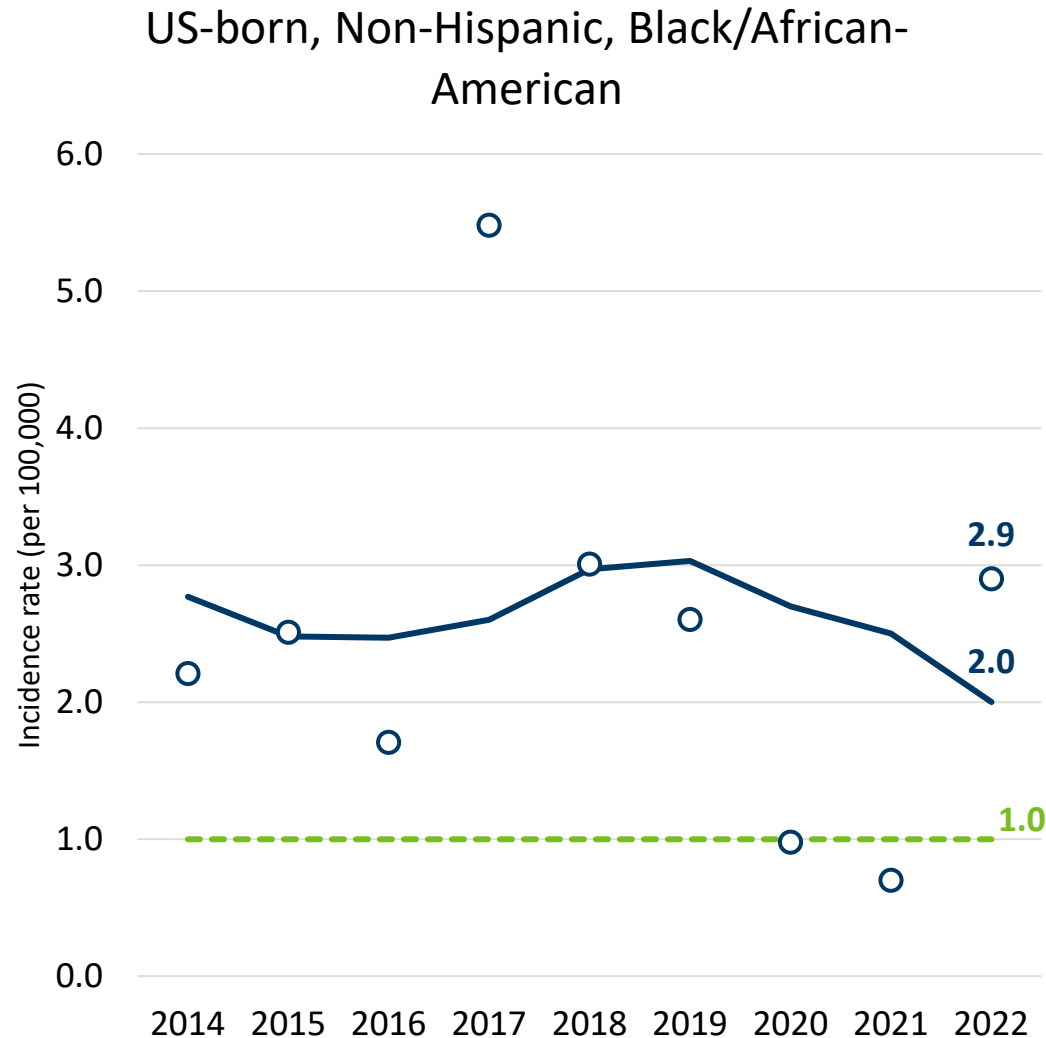
TB Incidence Rates per 100,000 Population United States and Minnesota, 2003-2022



2025 CDC TB Incidence Reduction Targets for US-born and Non-US-born populations, Minnesota, 2010-2022

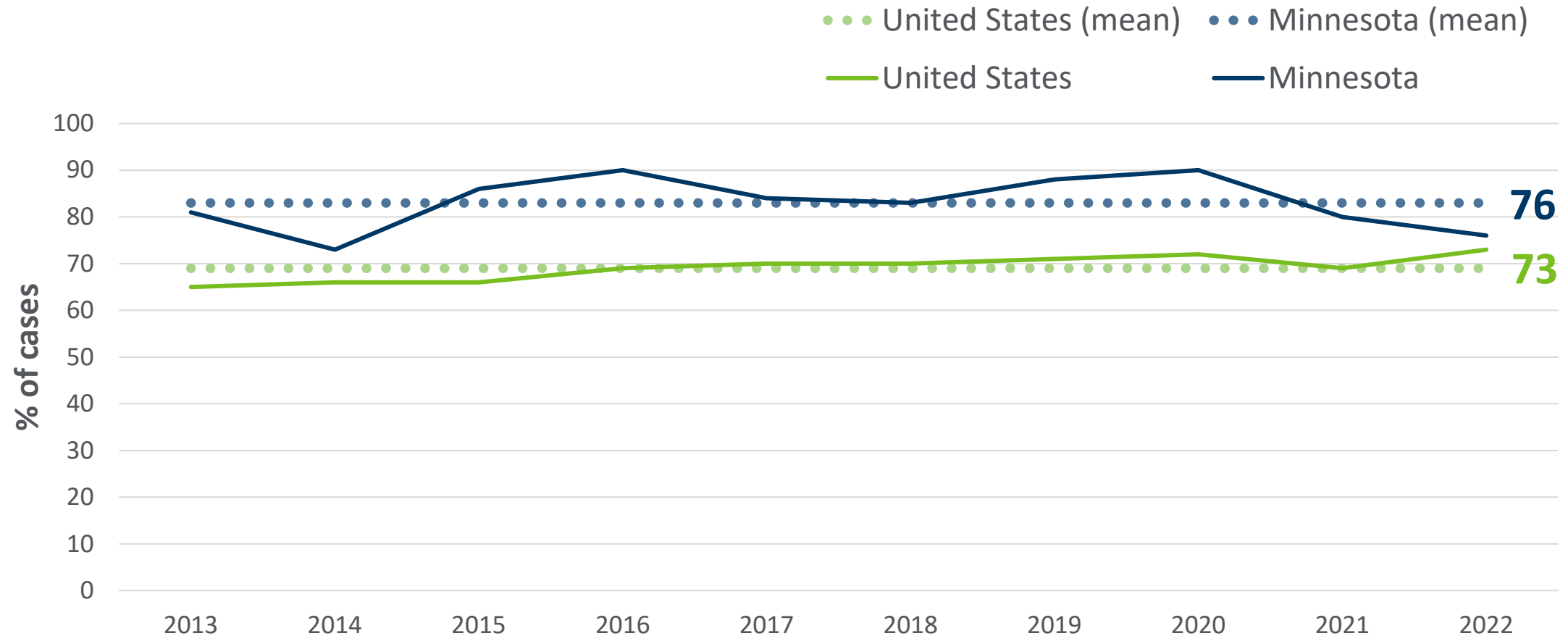


2025 CDC TB Incidence Reduction Targets continued, Minnesota, 2014-2022

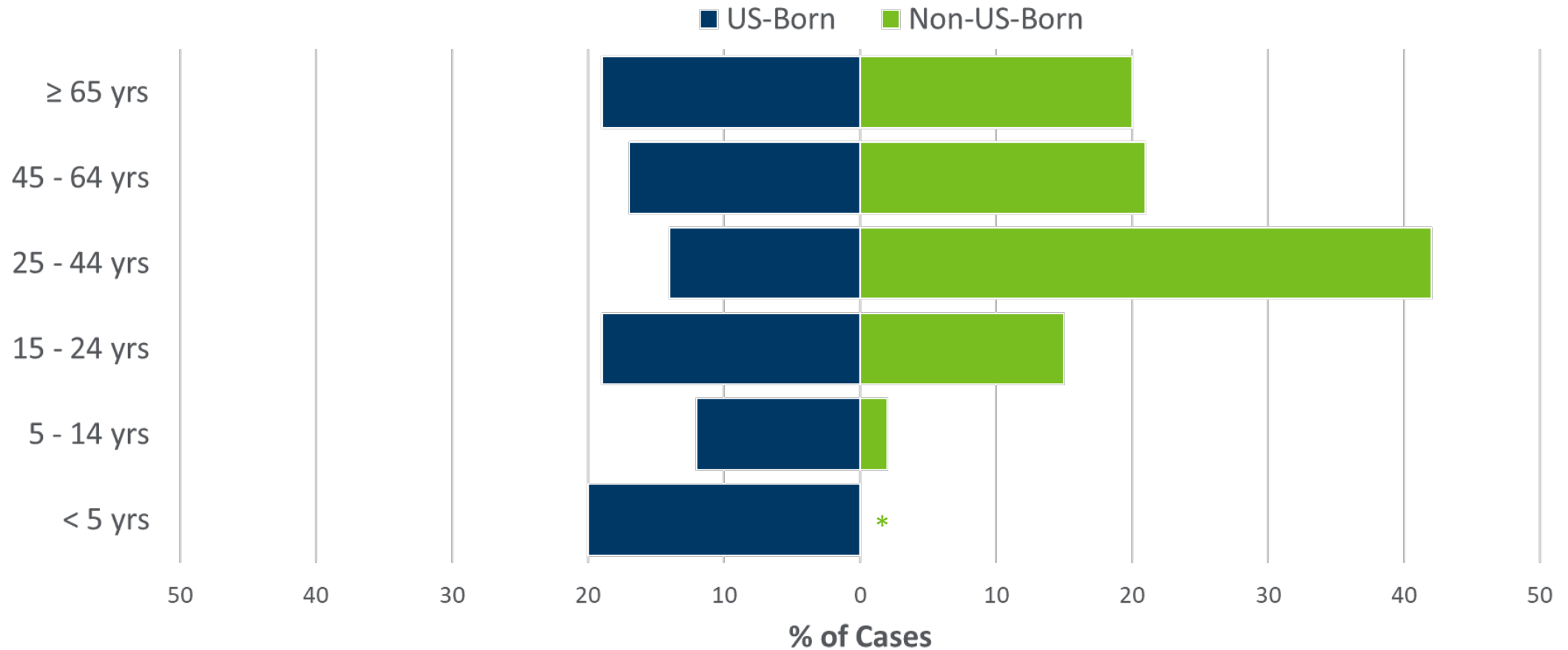


Proportion of TB Cases Born Outside of the United States

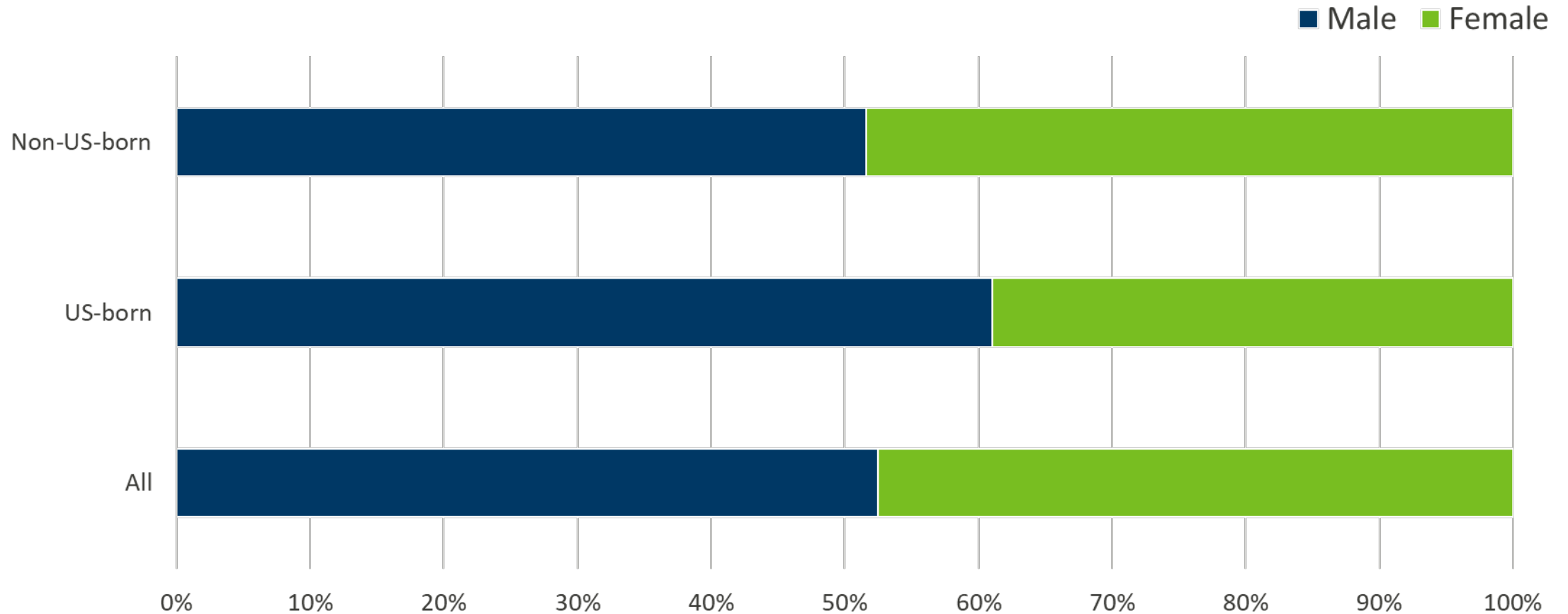
United States and Minnesota, 2013-2022



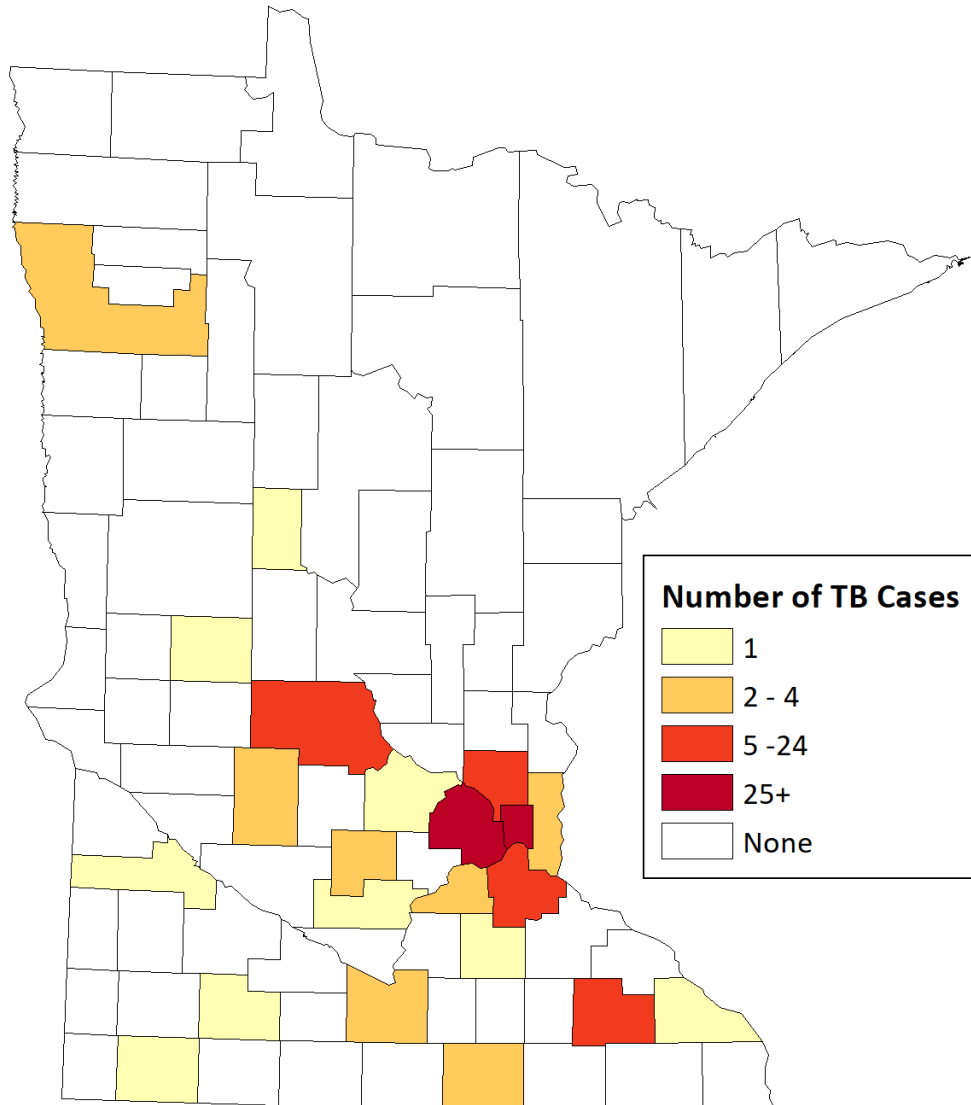
TB Cases by Age Group and Place of Birth Minnesota, 2018-2022



TB Cases by Sex Assigned at Birth and Place of Birth Minnesota, 2018-2022



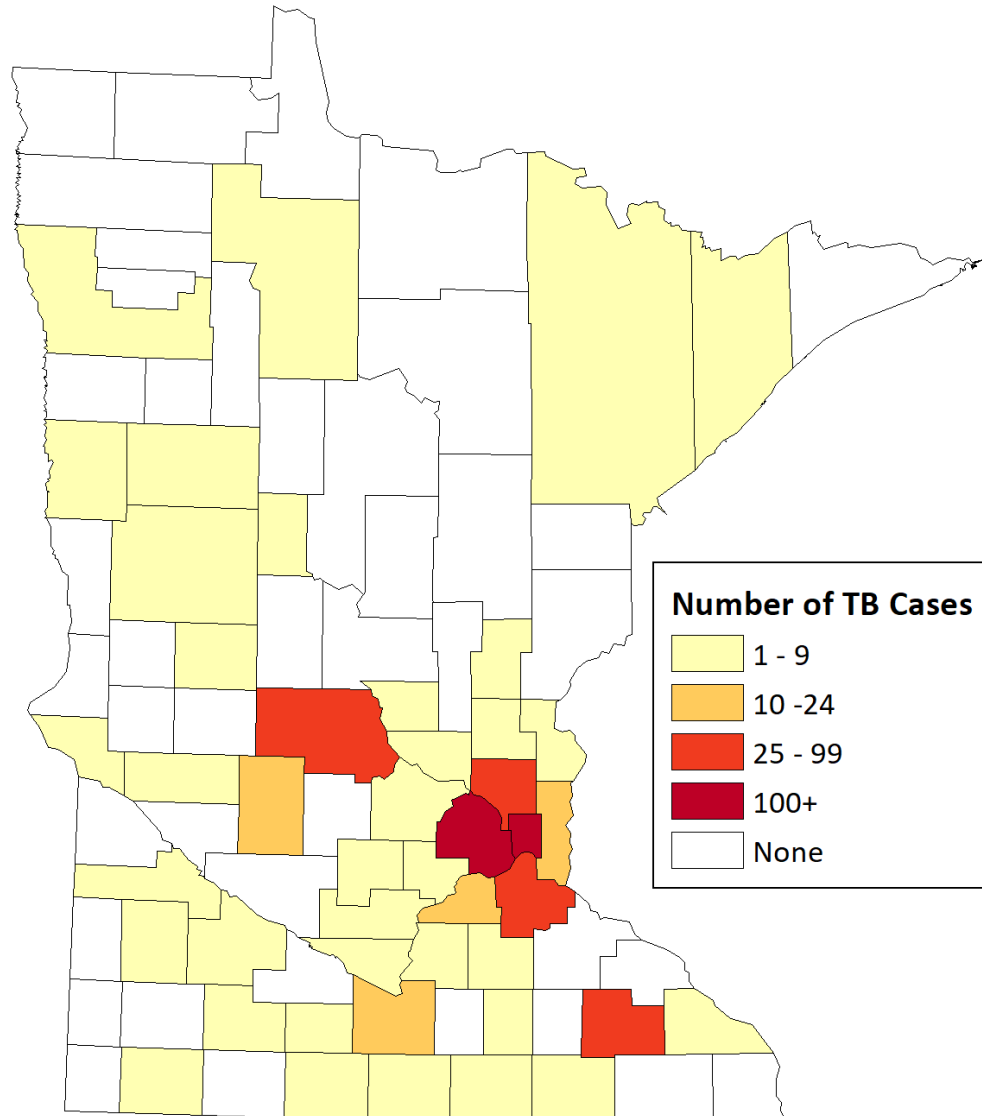
TB Disease by County of Residence Minnesota, 2022



Location of Residence	Count (% of total)
Hennepin County	44 (33)
Ramsey County	28 (21)
Suburban Metro*	28 (21)
Greater MN	32 (25)
Total	132

*Anoka, Carver, Dakota, Scott, Washington

TB Disease by County of Residence Minnesota, 2018-2022



Location of Residence	Count (% of total)
-----------------------	--------------------

Hennepin County	227 (32)
-----------------	----------

Ramsey County	162 (23)
---------------	----------

Suburban Metro*	137 (19)
-----------------	----------

Greater MN	177 (25)
------------	----------

Total	703
--------------	------------

*Anoka, Carver, Dakota, Scott, Washington

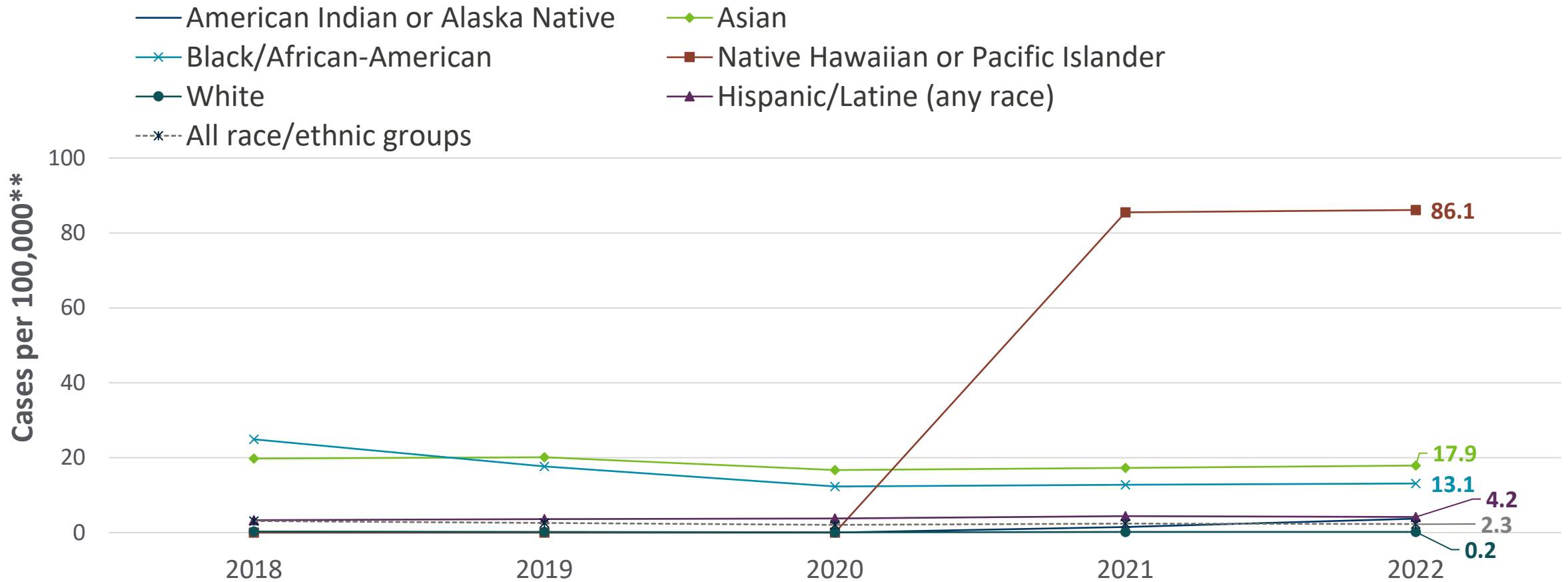
Number of Cases and Incidence of TB by Location of Residence Minnesota, 2018-2022

Location of Residence	2018 No. (Rate)*	2019 No. (Rate)*	2020 No. (Rate)*	2021 No. (Rate)*	2022 No. (Rate)*
Hennepin County	54 (4.3)	53 (4.2)	44 (3.5)	32 (2.5)	44 (3.5)
Ramsey County	34 (6.2)	29 (5.3)	31 (5.6)	40 (7.3)	28 (5.1)
Suburban Twin Cities Metro†	33 (2.6)	26 (2.0)	20 (1.5)	30 (2.3)	28 (2.1)
Olmsted County	12 (7.7)	6 (3.8)	1 (0.6)	4 (2.5)	5 (3.1)
Greater Minnesota (excluding Olmsted)	39 (1.7)	34 (1.4)	21 (0.9)	28 (1.2)	27 (1.1)
Total	172 (3.1)	148 (2.6)	117 (2.1)	134 (2.4)	132 (2.3)

* Cases per 100,000 population. Rates calculated using state population estimates from the U.S. Census Bureau.

† Anoka, Carver, Dakota, Scott, and Washington counties

TB Incidence Rate by Race*/Ethnicity Minnesota, 2018-2022



*Race categories do not include persons of Hispanic/Latino ethnicity. 1 multi-racial case is not included.

**Rate per 100,000 population. Calculated using population estimates from the U.S. Census Bureau.

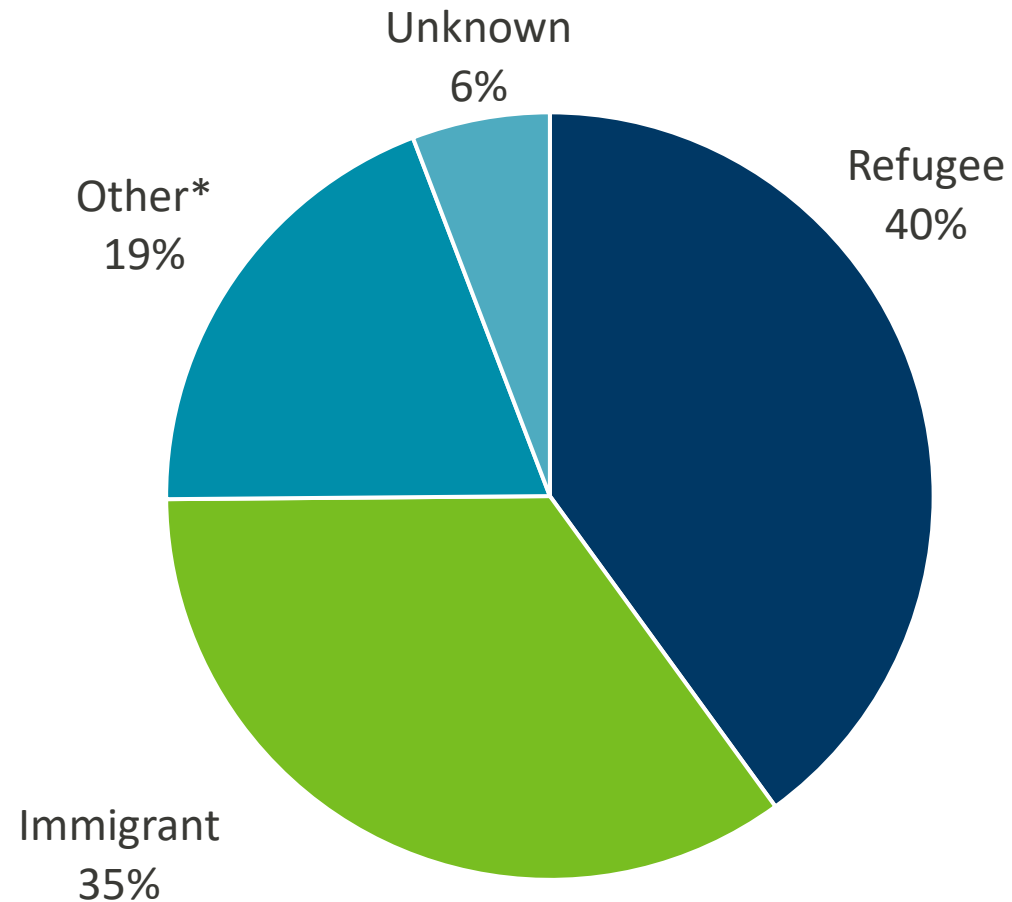
TB Cases by Race/Ethnicity and Place of Birth

Minnesota, 2018-2022

Race* / Ethnicity	Non-US-Born Cases No. (%)	US-Born Cases No. (%)
White	9 (2)	40 (34)
Black/African-American	298 (51)	31 (26)
Asian	225 (38)	30 (25)
American Indian / Alaska Native	0	4 (3)
Native Hawaiian / Pacific Islander	3 (<1)	1 (1)
Multi-racial	0	1 (1)
Hispanic / Latine	50 (9)	11 (9)
Total	585 (100)	118 (100)
*Race categories do not include persons of Hispanic/Latine ethnicity		

Non-US-Born TB Cases by Visa Status Upon Arrival in the US Minnesota, 2018-2022

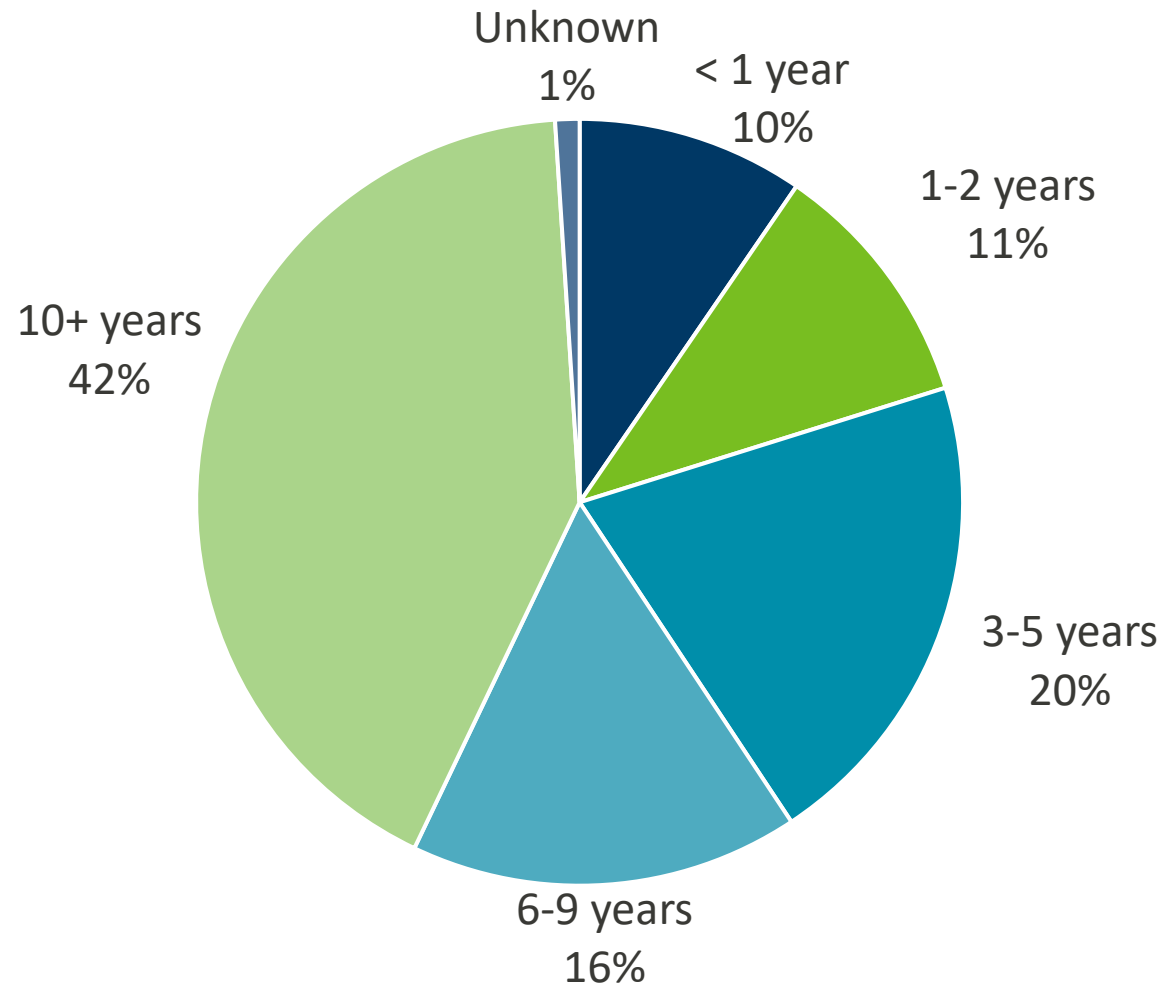
N = 585



* "Other" includes visitors, tourists, students, and those arriving on employment visas

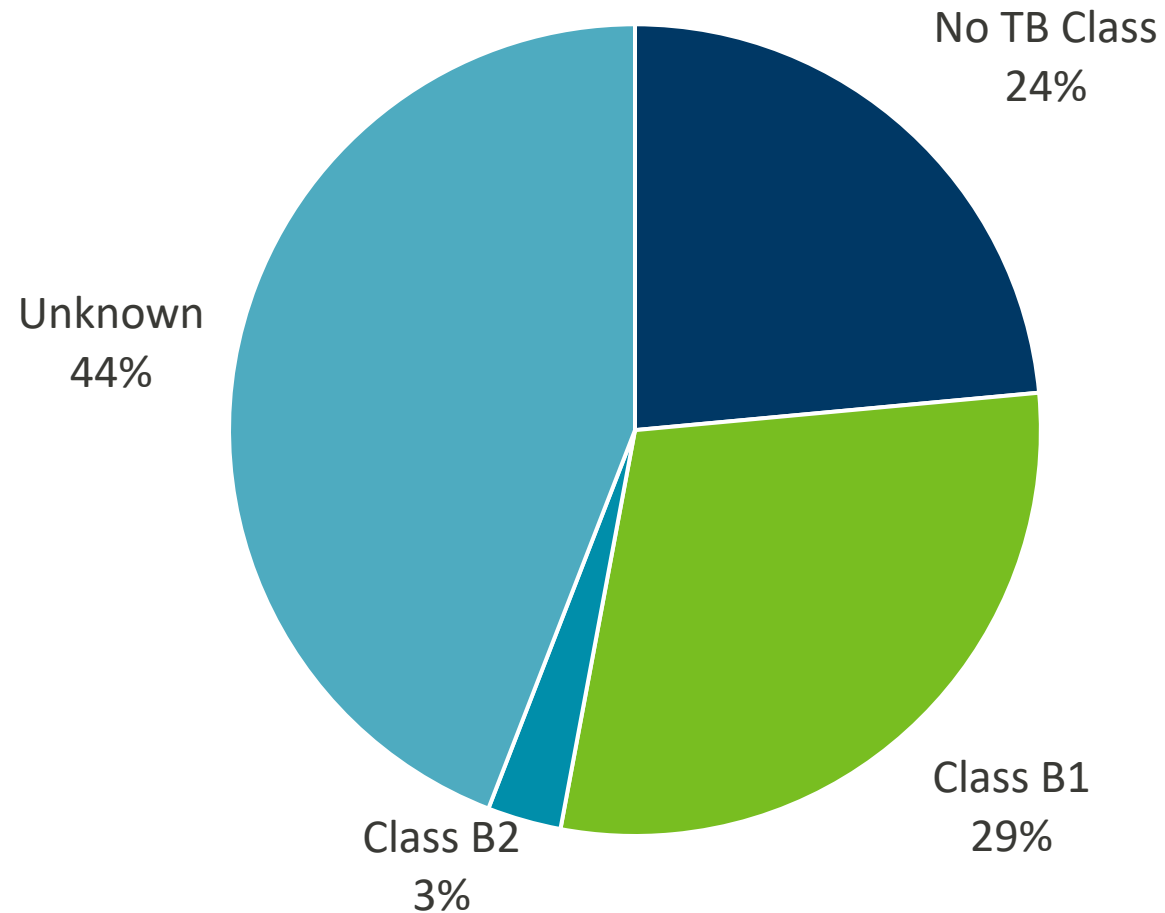
Non-US-Born TB Cases by Interval Between Arrival in US and Diagnosis of TB Minnesota, 2018-2022

N = 585



TB Class Notifications* Among Refugees/Immigrants Diagnosed with TB within One Year After Arrival to US Minnesota, 2018-2022

N = 34

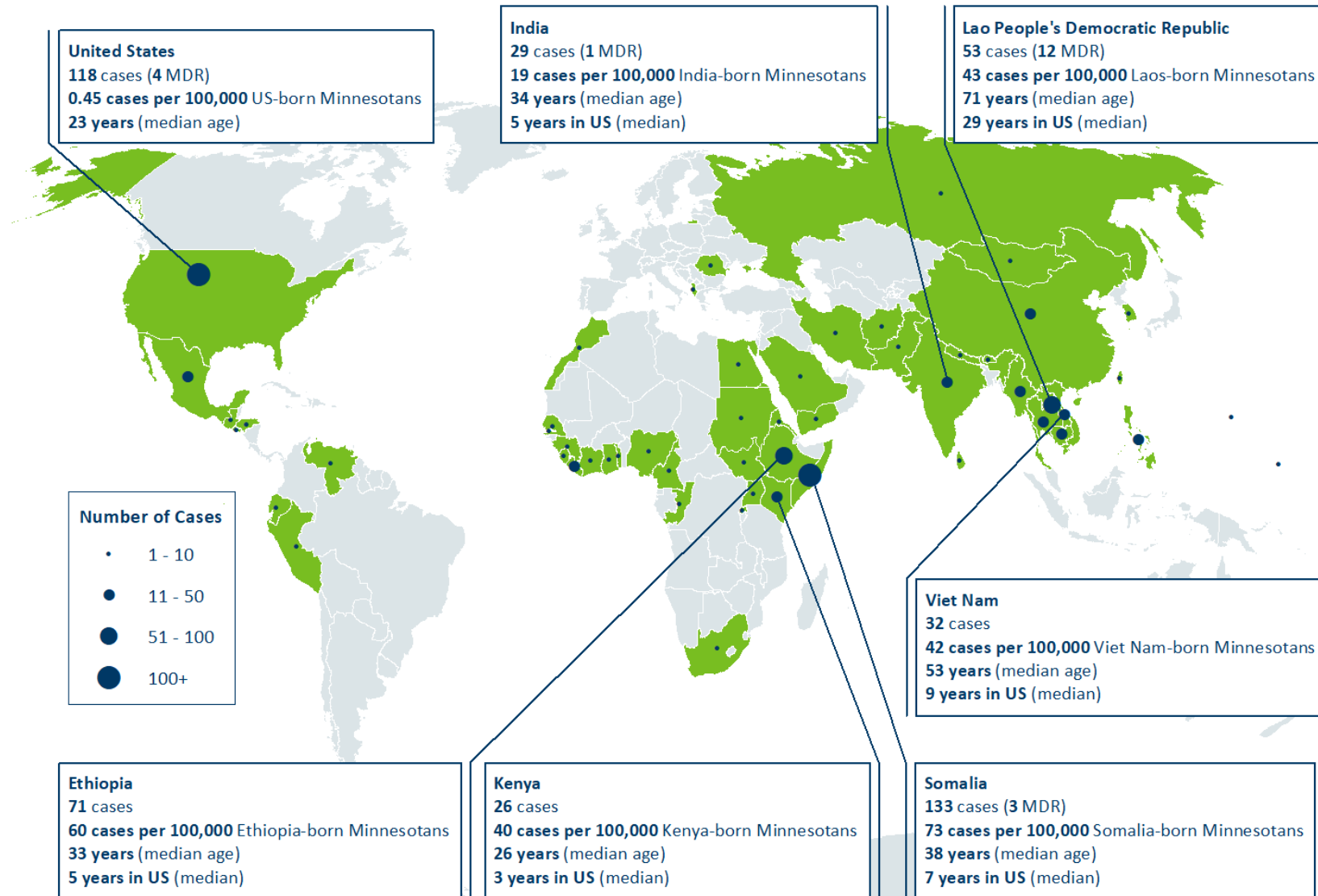


* Per results of pre-immigration screening performed overseas

Non-US-Born TB Cases by Top Five Countries of Birth Minnesota, 2018-2022

Country of Birth	No. of Cases (%)
Somalia	133 (23)
Ethiopia	71 (12)
Laos	53 (9)
<i>Viet Nam*</i>	32 (5)
<i>India*</i>	29 (5)
Kenya	29 (5)
Other	238 (41)
Total	585
<i>* Top 5 nationally in 2022. In order, these countries are Mexico, Philippines, India, Viet Nam, China.</i>	

Number of TB Cases by Country of Birth Minnesota, 2018-2022

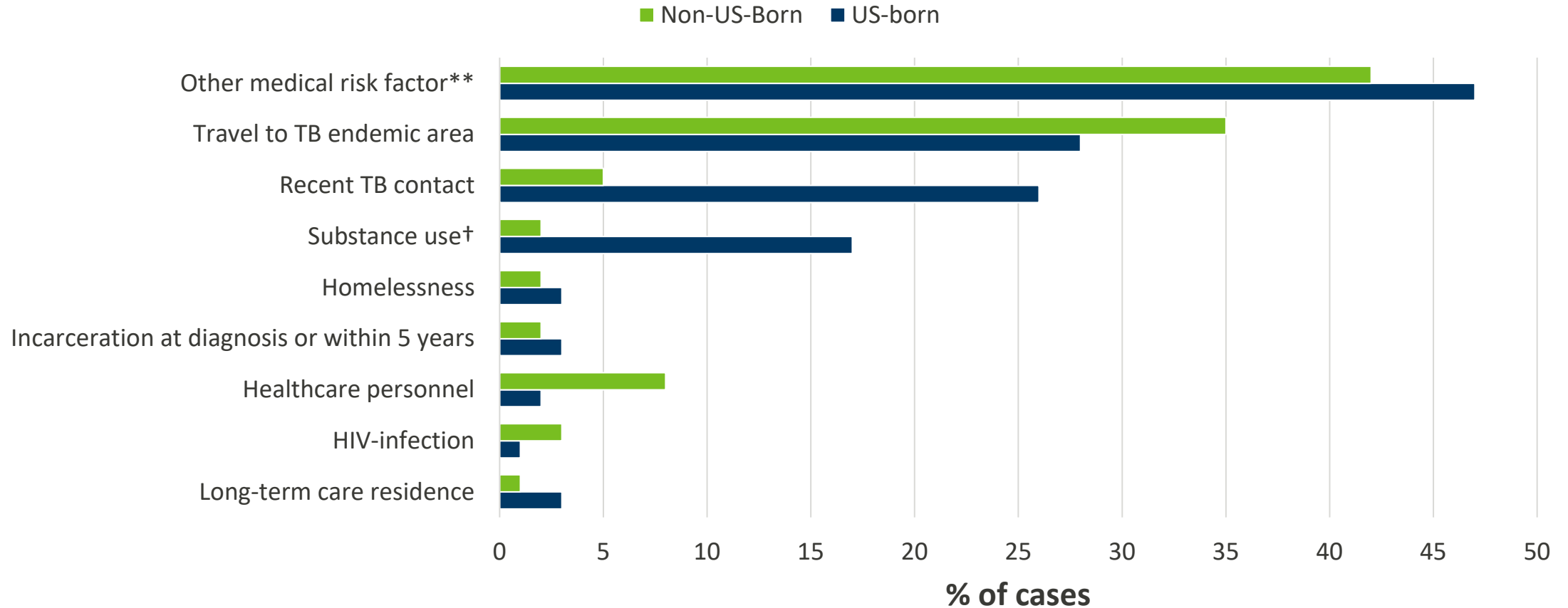


TB Cases by Method of Case Identification

Minnesota, 2018-2022

Method of Identification	No. of Cases (%)
TB symptoms	580 (83)
TB contact investigations	48 (7)
Overseas TB Class follow-up	7 (1)
Domestic refugee health exam	5 (<1)
Other immigration exams	6 (<1)
Employment screening (including health care personnel)	14 (2)
Other targeted testing	16 (2)
Incidental imaging or lab result	27 (4)
Total	703

TB Cases by Risk Category* and Place of Birth Minnesota, 2018-2022



*Risk categories are not mutually exclusive

**Conditions or therapies increasing risk for progression to active TB disease, not including HIV/AIDS

†Excess alcohol use and/or injection or non-injection drug use

TB Cases With Other Medical Risk Factors* by Type of Risk Factor Minnesota, 2018-2022

Medical risk factor**	Cases (N=703) No. (%)
Diabetes	127 (18)
Immunosuppressive condition (not HIV/AIDS) or therapy***	55 (8)
End stage renal disease	18 (3)
Weight loss/undernutrition/malabsorption	18 (3)
Other (e.g. chronic kidney disease, active smoking, hematologic disease, COVID-19)	171 (24)

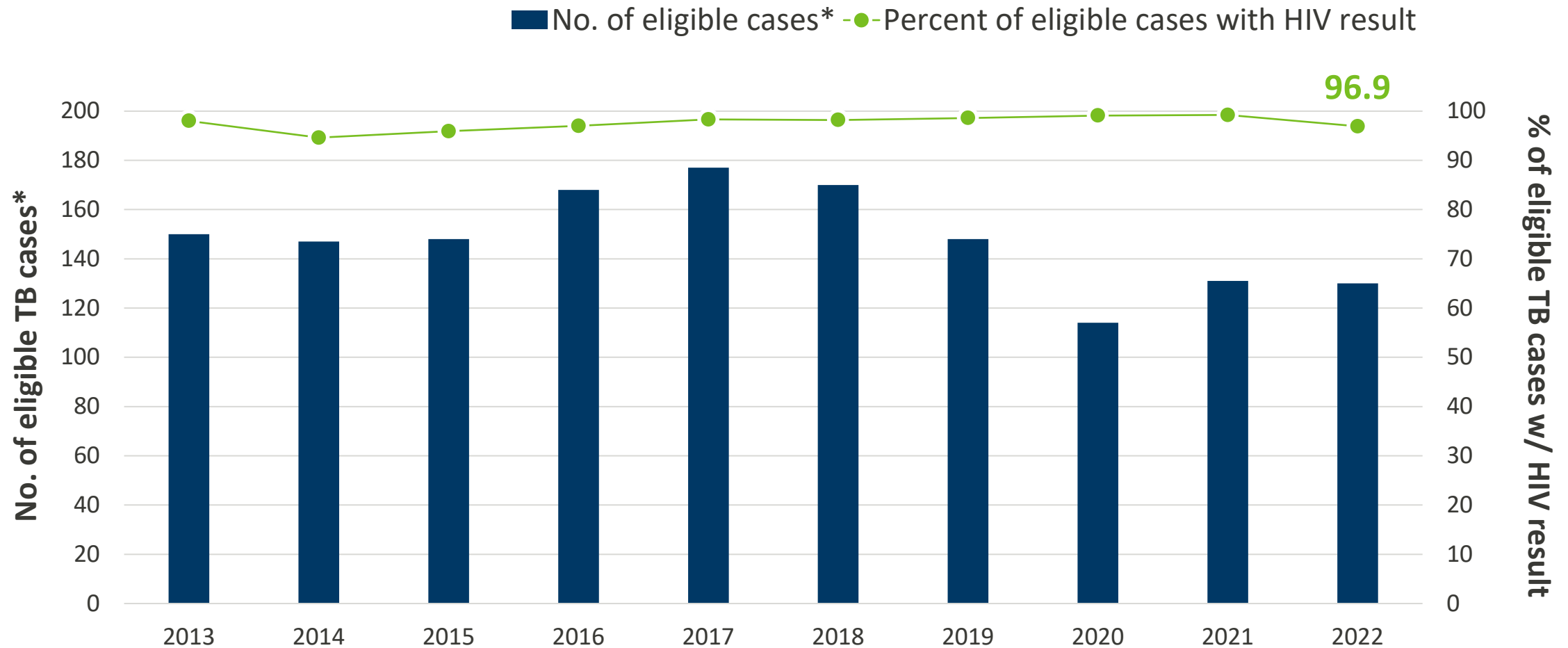
* Conditions or therapies that increase risk for progression from latent TB infection to active TB disease, not including HIV/AIDS

** Patients could have > 1 medical condition

*** Includes TNF α antagonist therapy and post-organ transplant anti-rejection drugs

HIV Testing in Persons with TB

Minnesota, 2013-2022



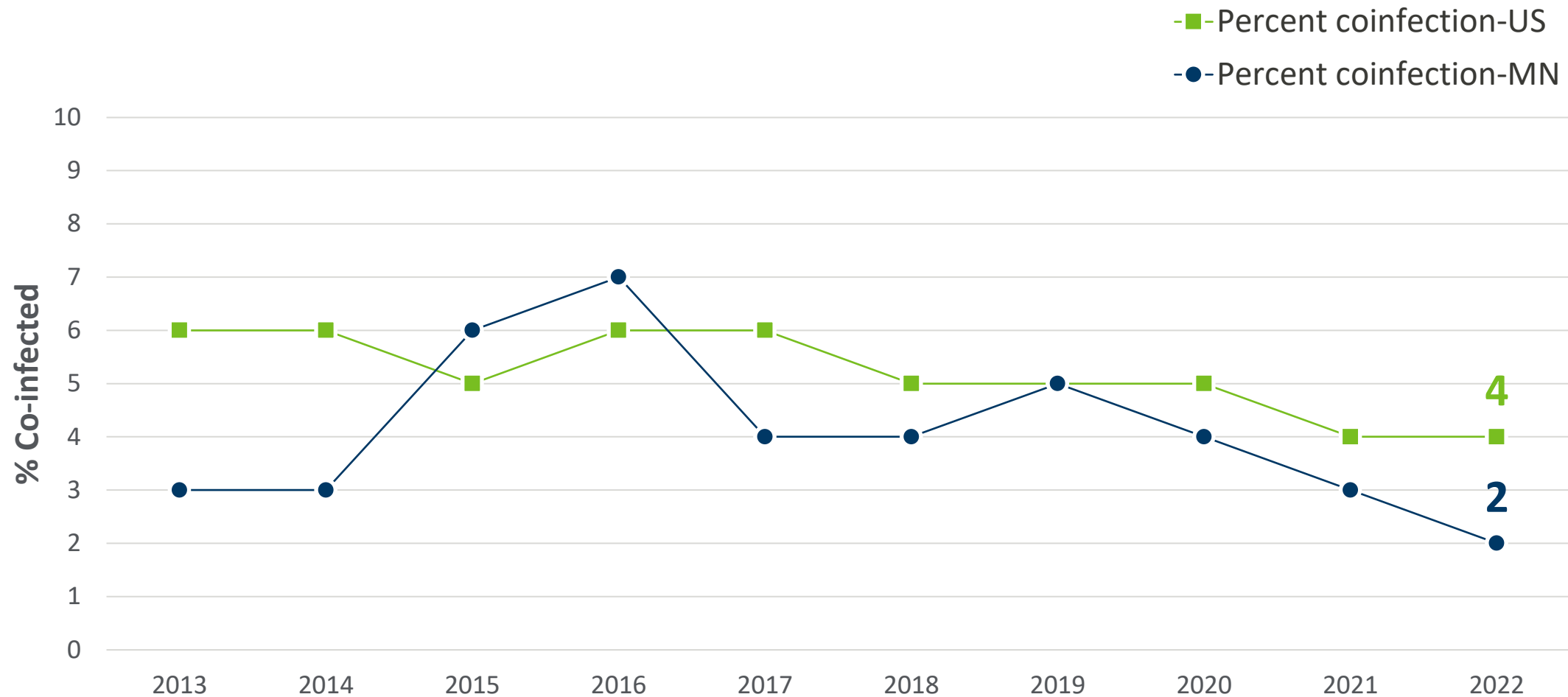
*Alive at time of diagnosis

TB Cases by HIV Status and Place of Birth Minnesota, 2018-2022

HIV Status	Non-US-Born Cases No. (%)	US-Born Cases No. (%)	Total No. (%)
Negative	557 (95)	113 (96)	670 (95)
Positive	15 (3)	1 (<1)	16 (2)
Not Offered	9 (2)	2 (2)	11 (2)
Refused HIV testing	4 (<1)	1 (<1)	3 (<1)
Unknown	0	1 (<1)	1 (<1)
Total	585	118	703

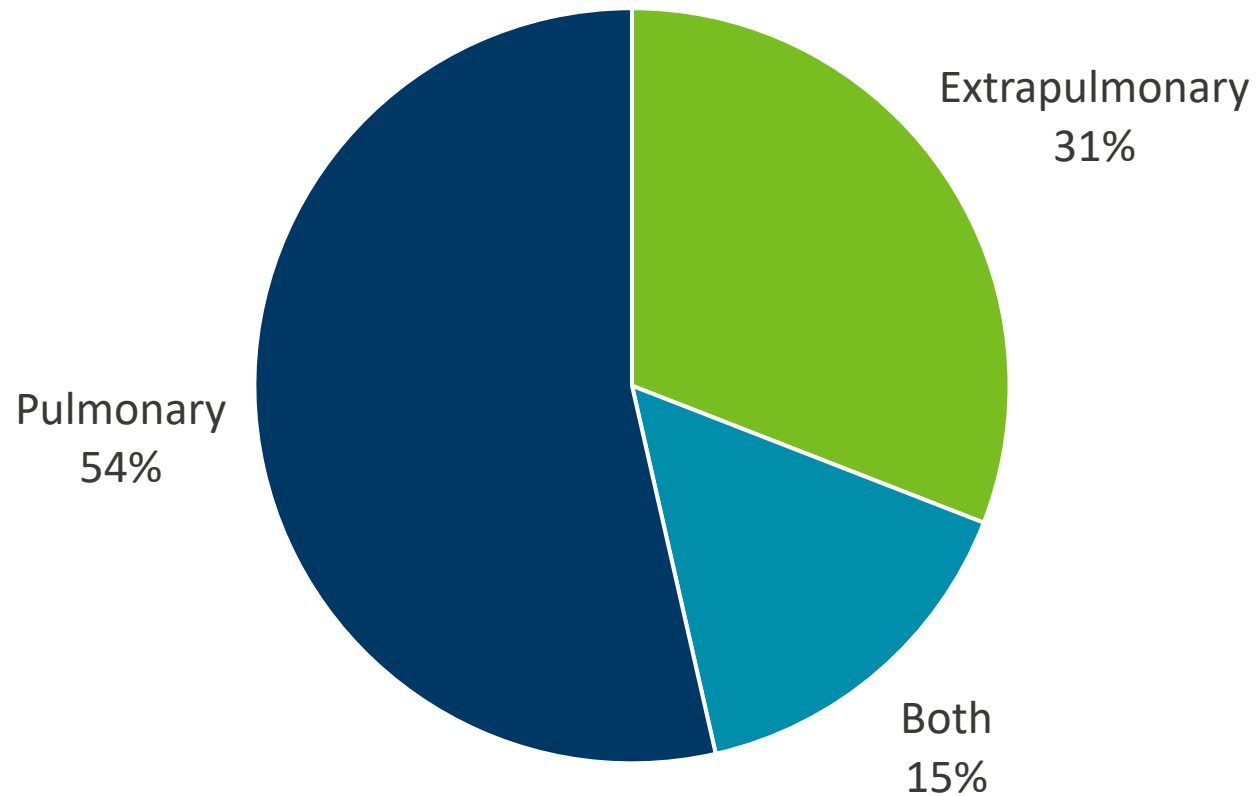
TB-HIV Co-infected Cases

United States and Minnesota, 2013-2022



TB Cases by Site of Disease Minnesota, 2018-2022

N = 702



Top five extrapulmonary sites of disease*

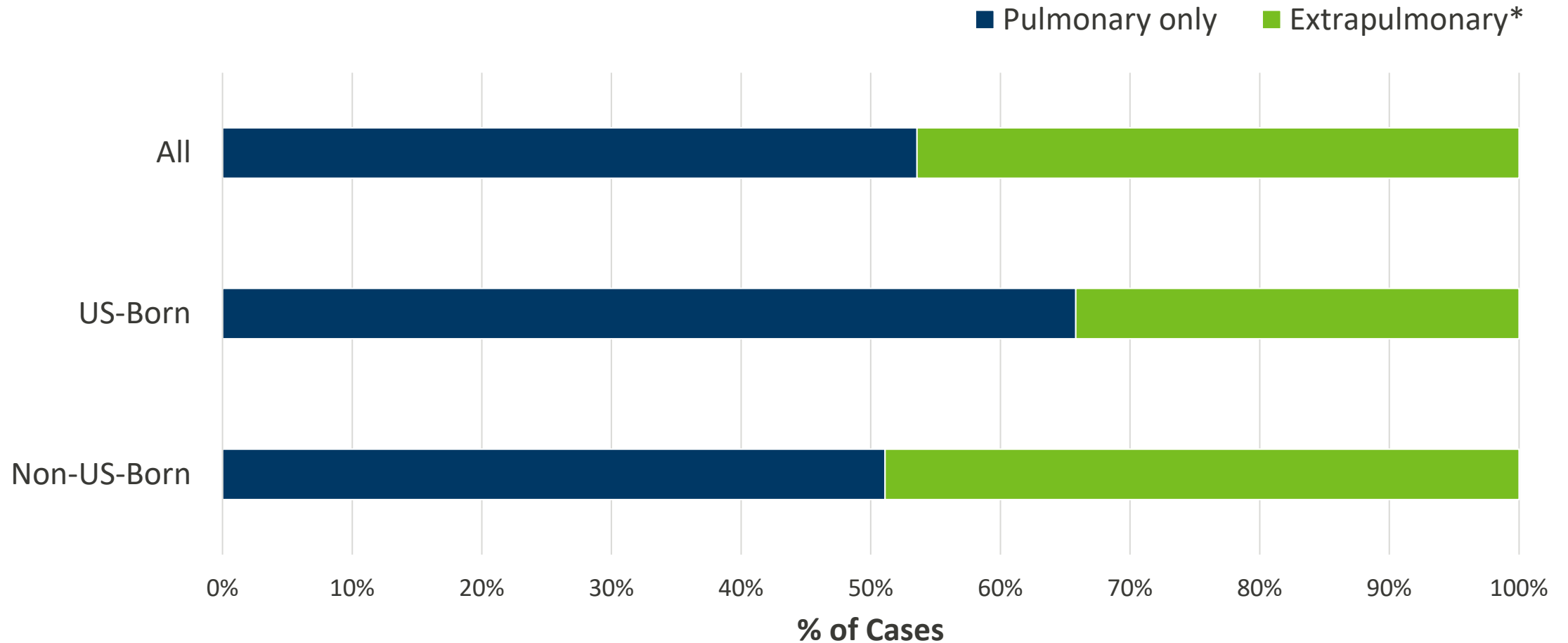
Cases (N=326)**
No. (%)

Lymphatic	153 (47)
Musculoskeletal	57 (17)
Pleural	45 (14)
Peritoneal	36 (11)
Genitourinary	23 (7)

* Patients may have multiple extrapulmonary sites of disease

** Includes TB cases with and without concurrent pulmonary disease

TB Cases by Site of Disease and Place of Birth Minnesota, 2018-2022

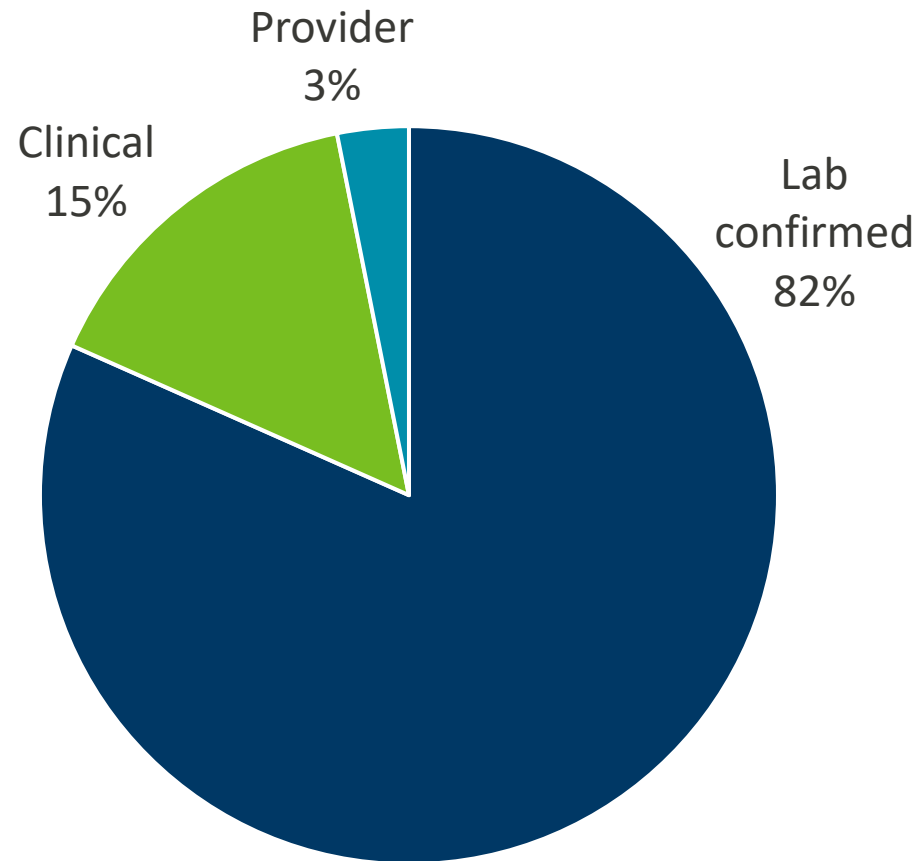


* Includes cases with and without concurrent pulmonary disease

TB Cases by Case Verification Criteria*

Minnesota, 2018-2022

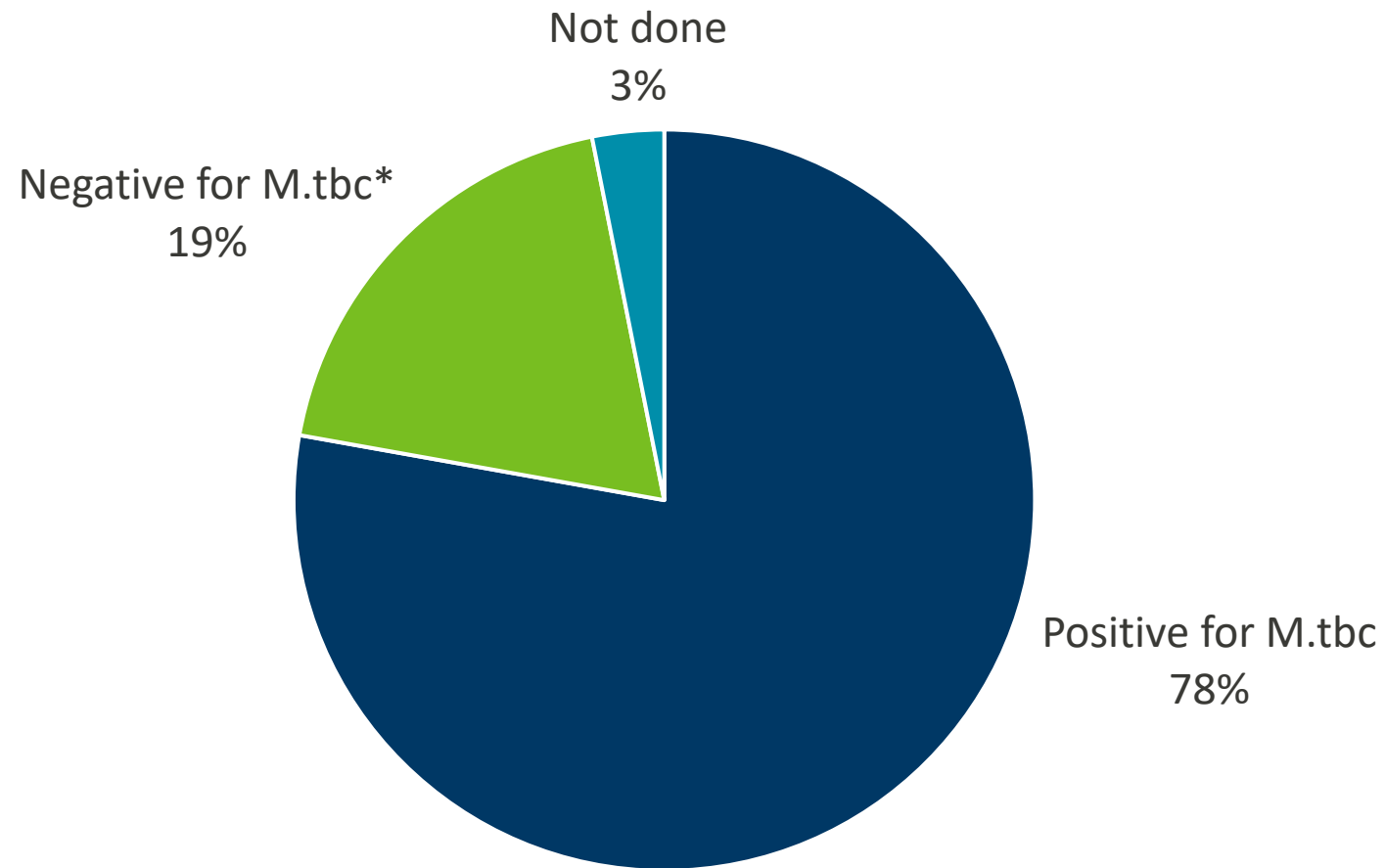
N = 703



*Based on the public health surveillance definition for TB [CDC. (August 2021) CDC Tuberculosis Surveillance Data Training: 2020 Report of Verified Case of Tuberculosis (RVCT) Instruction Manual. Atlanta, GA: U.S. Department of Health and Human Services, CDC. (Appendix A - Tuberculosis Case Definition for Public Health Surveillance)]

TB Cases by Mycobacterial Culture Result Minnesota, 2018-2022

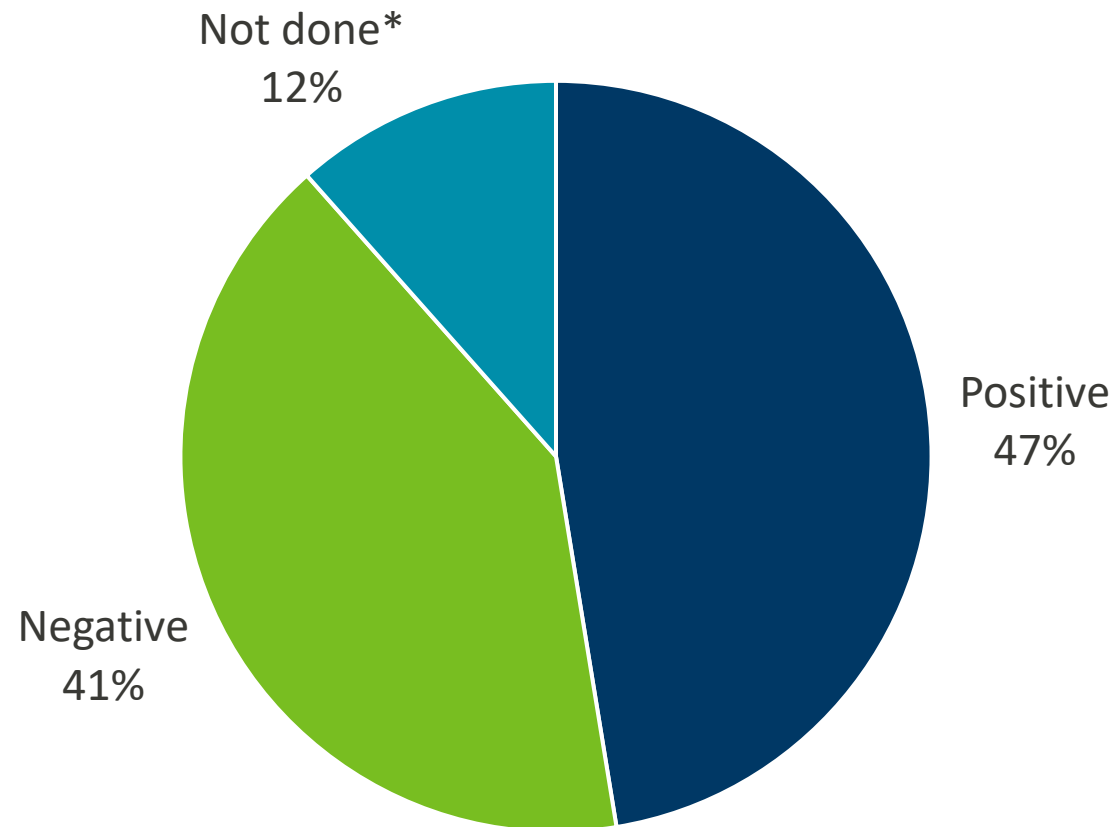
N = 703



*No growth or growth of other Mycobacterium species not part of *M.tb* complex

TB Cases with Pulmonary Involvement by Initial Sputum AFB Smear Result Minnesota, 2018-2022

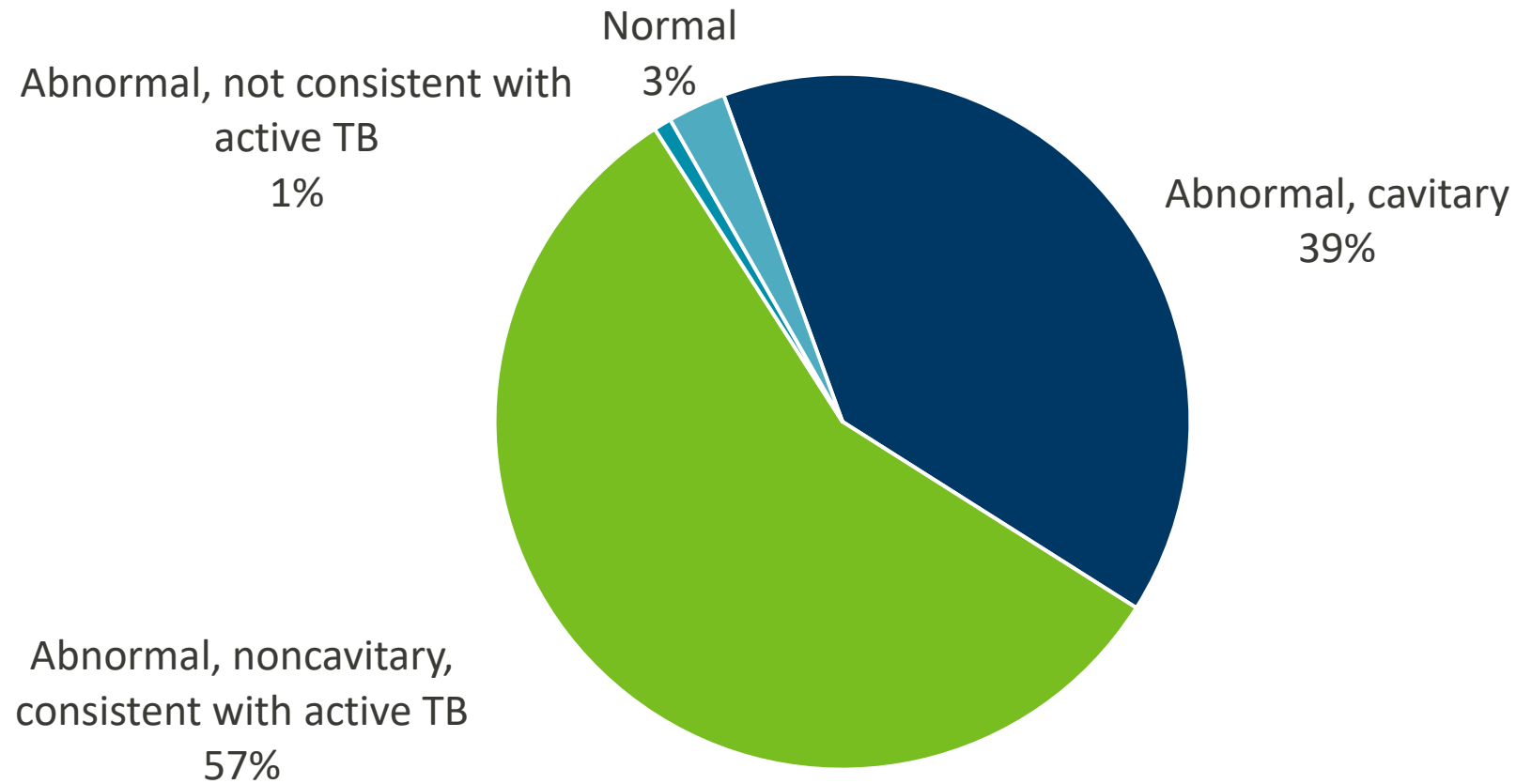
N = 485



**50% of pulmonary cases without sputum smear results were under 15 years of age*

TB Cases with Pulmonary Involvement by Chest Imaging* Result Minnesota, 2018-2022

N = 485



* From initial chest x-ray or chest CT scan. Two cases with pulmonary involvement did not have chest imaging performing (1 diagnosis made post-mortem).

TB Cases by Drug Susceptibility Patterns and Year Minnesota, 2018-2022

Year	Cases With Susceptibility Results*	Any Drug Resistance† No. (%)	INH- Resistant** No. (%)	MDR TB‡ No. (%)
2018	134	26 (19)	16 (12)	7 (5)
2019	126	17 (13)	13 (10)	6 (5)
2020	90	12 (13)	11 (12)	3 (3)
2021	94	10 (11)	9 (10)	4 (4)
2022	103	13 (13)	11 (11)	3 (3)
Total	547	78 (14)	60 (11)	23 (4)

* Culture-confirmed cases with drug susceptibility results available

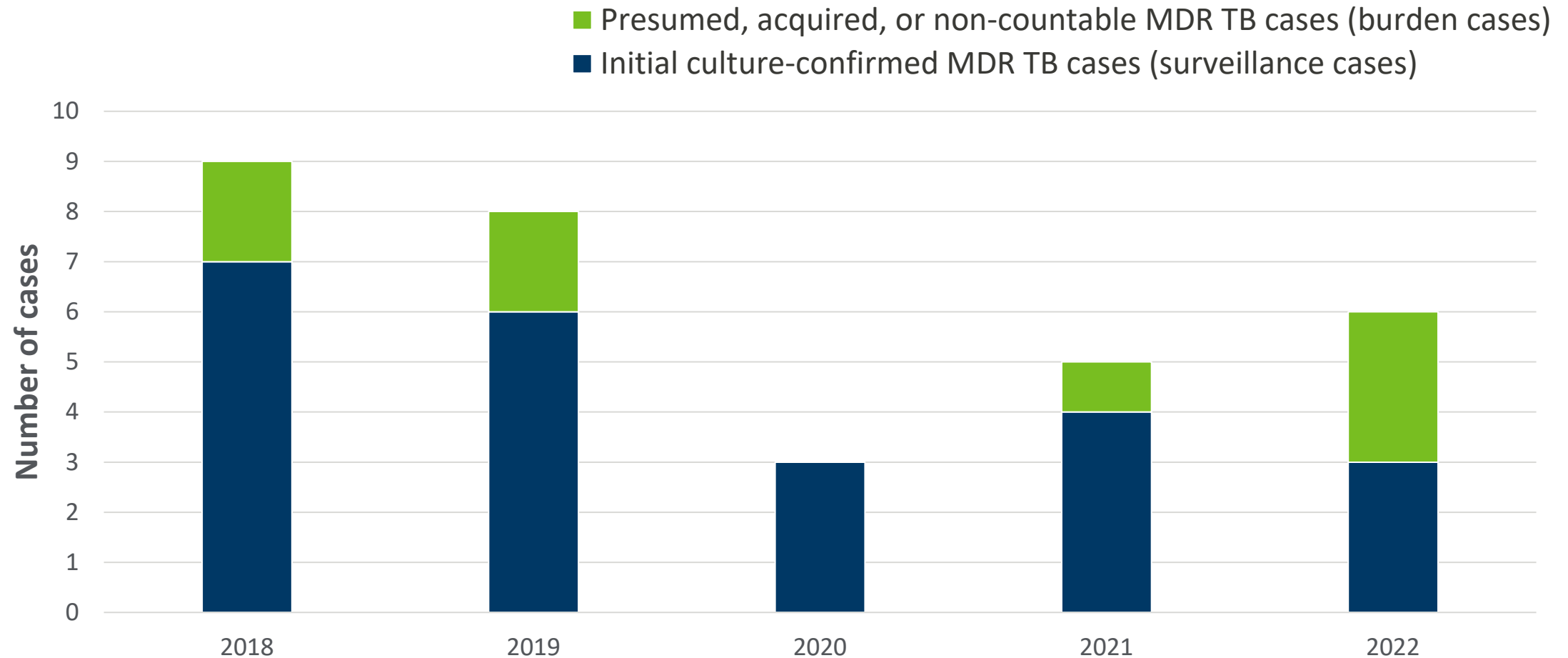
† Resistance to at least one first-line anti-TB drug [i.e., isoniazid (INH), rifampin (RIF), pyrazinamide (PZA), or ethambutol (EMB)]

** INH-resistant cases may also be resistant to other drugs

‡ Multi-drug resistant TB, defined as resistance to at least INH and rifampin (may also be resistant to other drugs)

Multi-drug Resistant TB (MDR TB)

Minnesota, 2018-2022



TB Cases by Drug Susceptibility Patterns and Place of Birth Minnesota, 2018–2022

Place of birth	Cases With Susceptibility Results*	Any Drug Resistance† No. (%)	INH- Resistant** No. (%)	MDR-TB‡ No. (%)
Non-US-Born	467	69 (15)	53 (11)	19 (4)
US-Born	80	9 (11)	7 (9)	4 (5)
Total	547	78 (14)	60 (11)	23 (4)

* Culture-confirmed cases with drug susceptibility results available

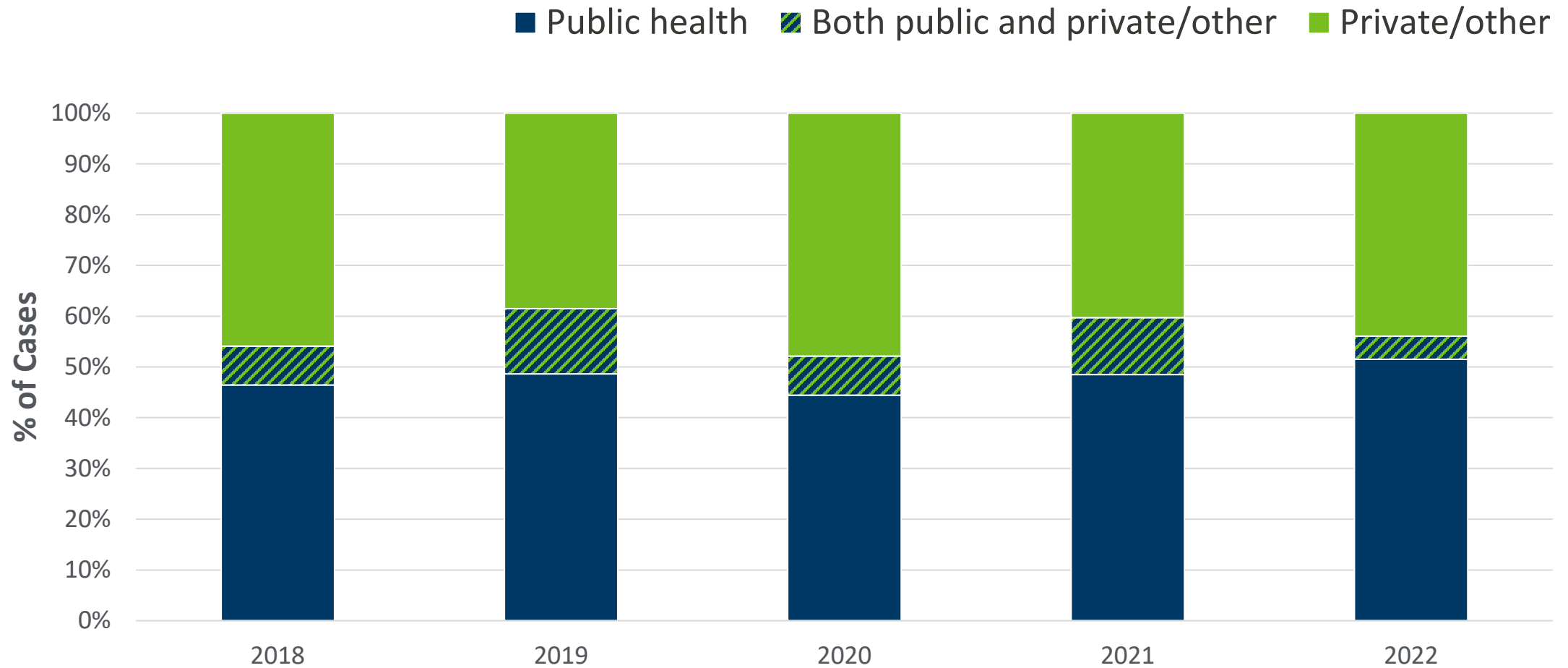
† Resistance to at least one first-line anti-TB drug [i.e., isoniazid (INH), rifampin (RIF), pyrazinamide (PZA), or ethambutol (EMB)]

** INH-resistant cases may also be resistant to other drugs

‡ Multi-drug resistant TB, defined as resistance to at least INH and rifampin

TB Cases by Type(s) of Provider*

Minnesota, 2018-2022



* Some patients are managed by multiple providers throughout disease course

TB Cases by Mode of Treatment Administration

Minnesota, 2018-2022

Year	Started treatment	At least some DOT*	Completely self-administered
2018	170	98%	1%
2019	146	100%	0%
2020	115	99%	<1%
2021	129	99%	<1%
2022	130	99%**	0%
Total	690	99%	<1%

Type of Provider	Started treatment	At least some DOT*	Completely self-administered
Public	397	100%	0%
Private only	293	99%	1%

*DOT = Directly Observed Therapy

**Treatment administration unknown for 1 case.

Treatment Completion and Length of Therapy Among TB Cases Minnesota, 2017-2021 as of February 16, 2024

Year	Started Treatment*	Completed Within 12 mos.** No. (%)	Completed Overall** No. (%)
2017	138	132 (96)	138 (100)
2018	139	128 (92)	135 (97)
2019	114	102 (89)	110 (96)
2020	93	85 (91)	92 (99)
2021	102	90 (88)	96 (94)
Total	586	537 (92)	571 (97)

* Patients for whom < 12 months of therapy is indicated. This excludes patients with rifampin resistance, meningeal TB, TB in bone or skeletal system, TB in CNS, children 14 years of age or younger with disseminated TB, patients who died or moved out of US within 366 days of starting treatment.

** Treatment completion data as of 8/29/2022