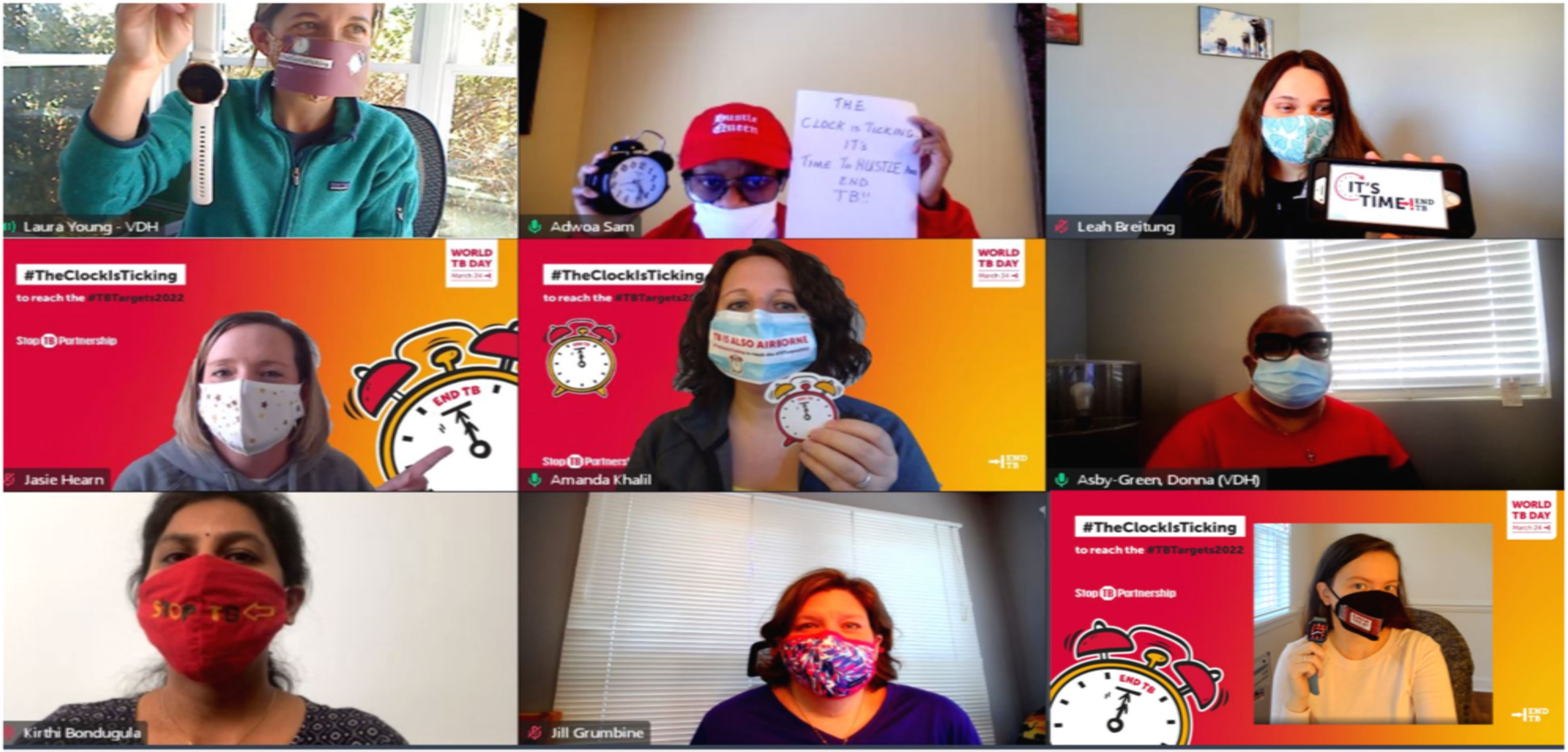


The VDH TB & Newcomer Health Programs Are Counting Down to TB Elimination

World TB Day 2021

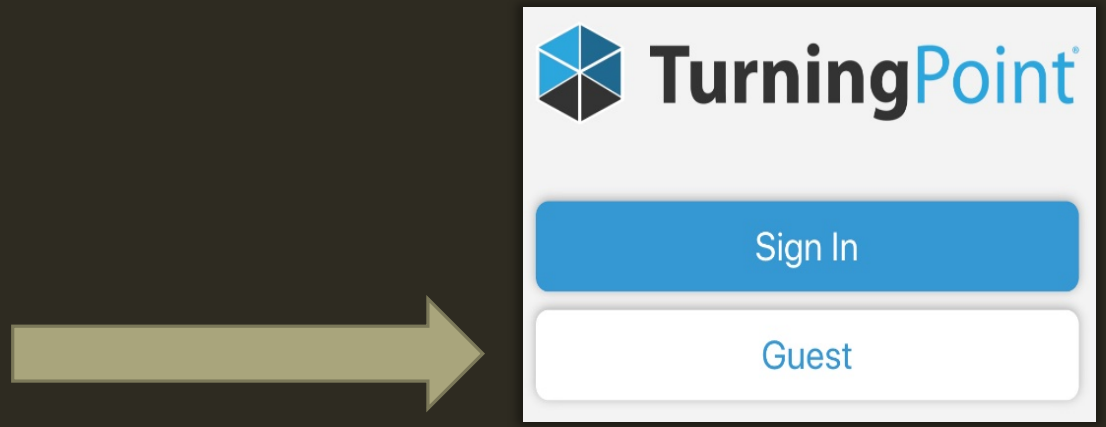
WORLD TB DAY — MARCH 24 —

WORLD TB DAY

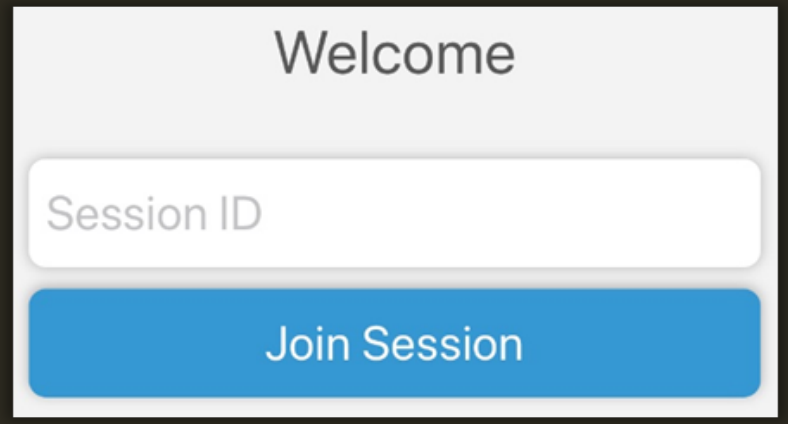
March 24, 2021

POLLING QUESTIONS

Visit: www.ttpoll.com



Session ID



AGENDA

- Program Updates and Announcements: Jasie Hearn
- Epi Update: Laura Young and Jane Tingley
- What are you? Show me your ID!
  - Dr. Eric Houpt and Dr. Scott Heysell
- Questions

PROGRAM UPDATES

- New TB Program Manager: Jasie Hearn
- Hiring a contract monitor and administrative support
- Continued support of COVID-19 response

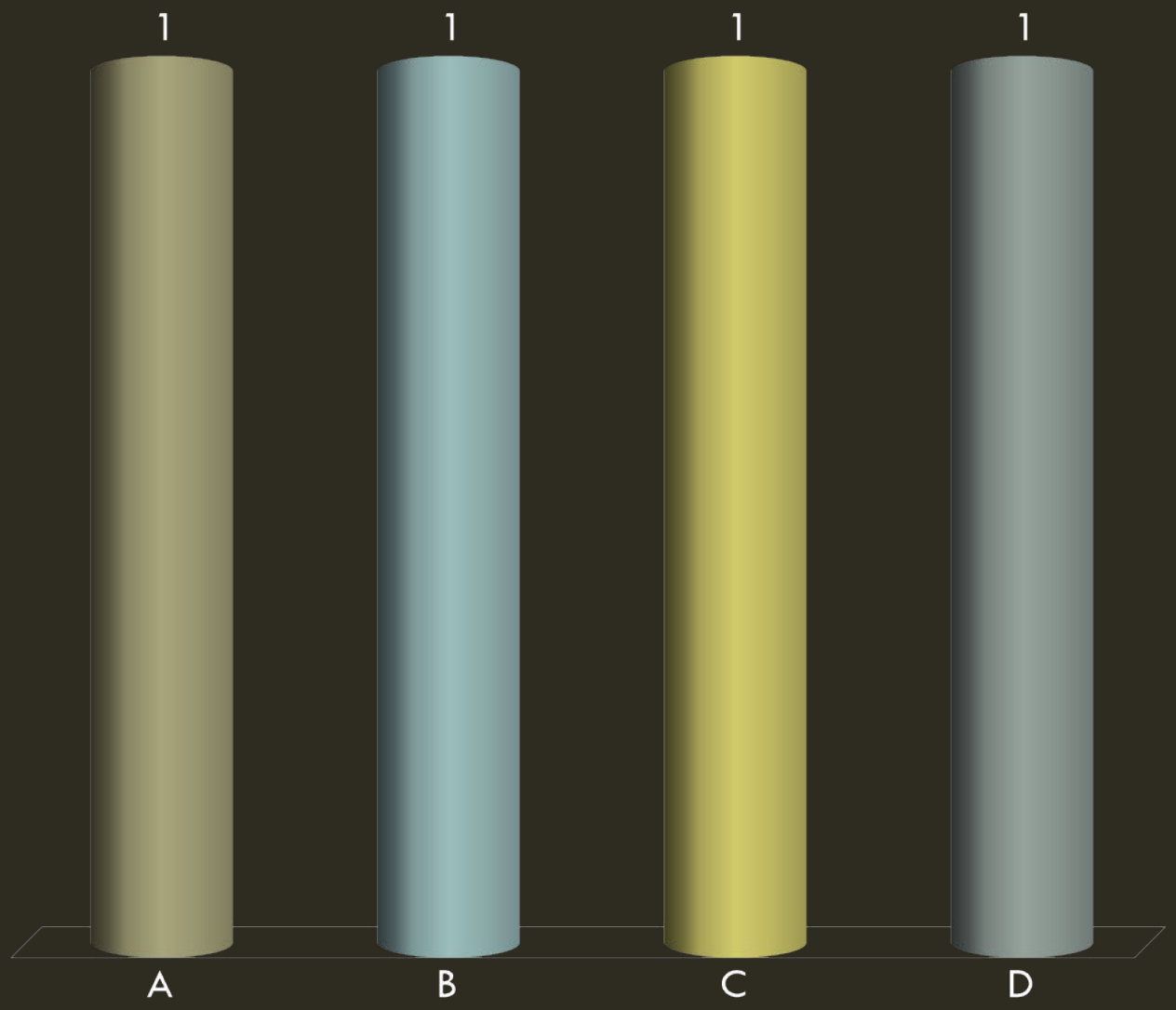
HOW MUCH TIME ARE YOU SPENDING ON THE COVID-19 RESPONSE?

A. 0% - 25%

B. 26% - 50%

C. 51% - 75%

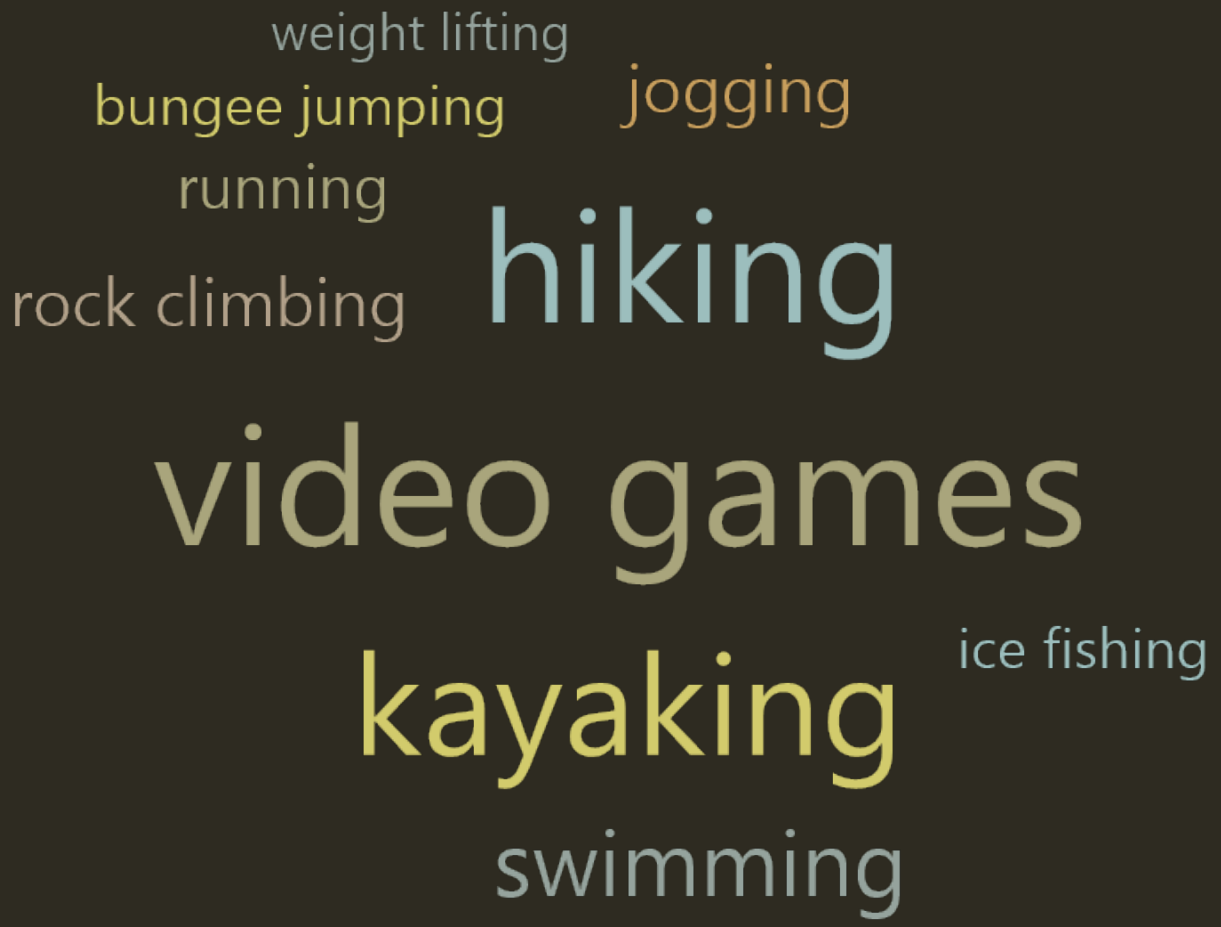
D. 76% - 100%



TRAINING OPPORTUNITIES

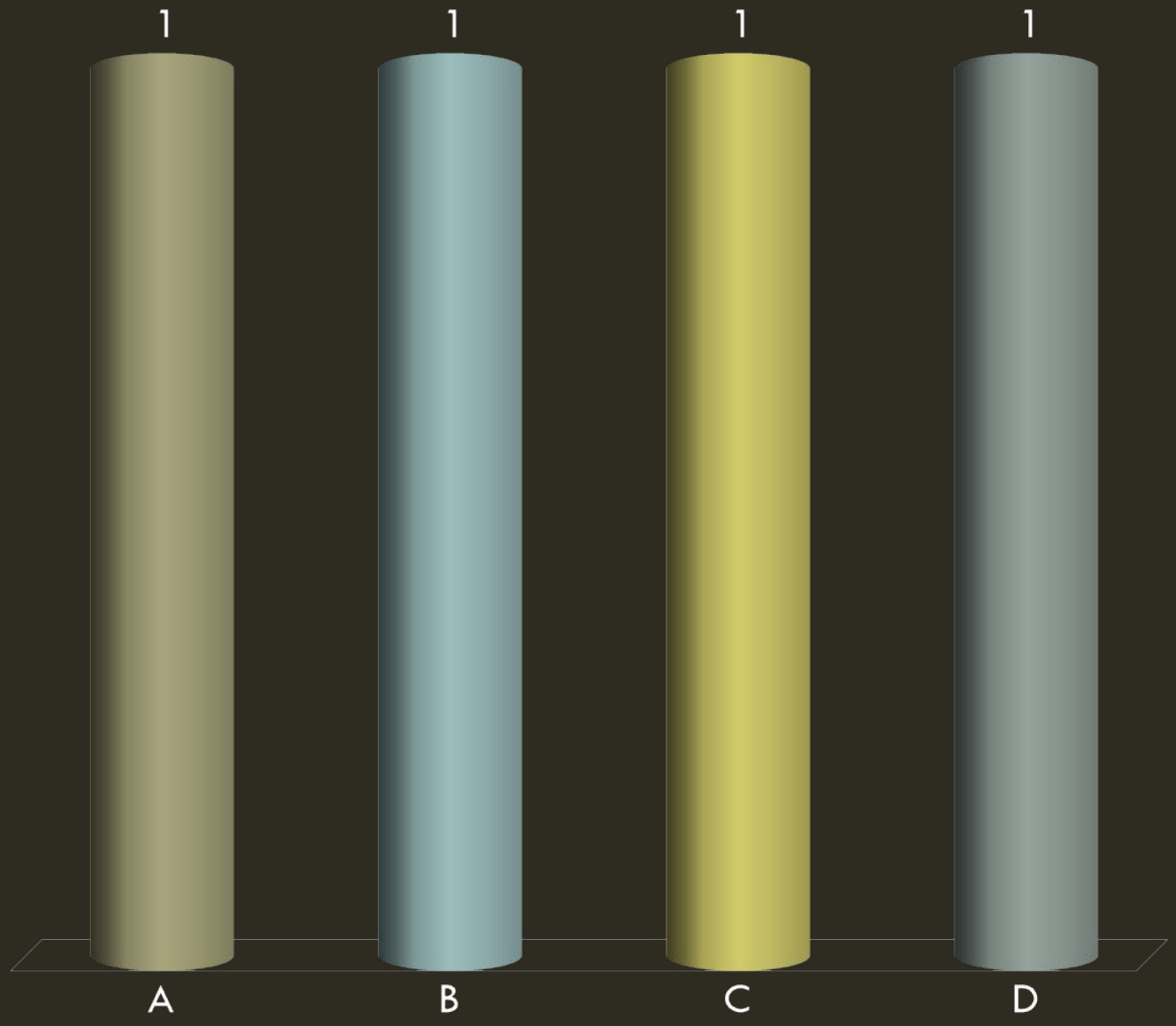
- New TB Nurse Training – Virtual
  - April 28, 2021
  - September 29, 2021
  - November 4, 2021
  - Registration: VDH TB Program Training Page
- Lab Training – May 14, 2021, 1 – 2 PM
- QuantiFERON-TB Gold Plus Training – April 22, 2021, 10:30 – 11:30 AM
- Biennial Nurse Meeting and Biennial TB Outreach Worker Meeting – Postponed (2022)
- Special opportunity for nurses to attend the virtual National TB Conference (June/July)
- RVCT/VEDSS and EDN Training
- Webinars
- On-demand Courses

WHAT TRAINING TOPICS ARE YOU INTERESTED IN?



HOW MUCH TIME DO YOU THINK YOU WILL HAVE IN THE NEXT FEW MONTHS TO ATTEND TRAINING, IF OFFERED?

A. Little to none
B. A couple of hours sporadically
C. A few hours/month
D. I can attend at any time



OPPORTUNITIES FOR ENGAGEMENT

- Workload Evaluation Project
- Case Review
- Cohort Review

PROCESS IMPROVEMENT

- Second line drug approval process
  - New web-based form
- Alternative Housing and Incentives Program
- T Spot and QuantiFERON-TB Gold Plus Testing
- Send information via encrypted email instead of faxing
  - tuberculosis@vdh.virginia.gov

NEW AND NOTEWORTHY

- Treatment advancements
  - BPaL
  - LTBI Testing and Treatment: Clinical Recommendations
  - Shorter-course Treatment Regimen for TB Disease (Clinical Trials)

RESOURCES FOR DISTRICTS

- Guidance and Website updates
  - Sputum Collection Recommendations
  - Therapeutic Drug Monitoring Guidance
  - Orientation Plan for Public Health Nurses
  - Treatment Summary Templates
  - EDN Guidance
  - Annual TB Education Template
- Data and Reports
  - 2019 Virginia TB Fact Sheet
  - 2019 Virginia TB Annual Report
- GTBI
  - ID Crowd
- UVA Consultants
- Don't forget about incentives and enablers for your clients!

Are there resources you are looking for?

GOING ABOVE AND BEYOND

- Assisting another state on the weekend by tracking down a critically ill TB client's family member – saved the patient's life!
- Working with non-compliant clients
  - French fries and applesauce
  - Client traveled out of the country without clearance
- Ensuring clients receive medications
  - Coming in early
  - Staying late
  - Meeting them in various locations and settings
- Conducting large contact investigations in the midst of COVID-19
  - Then finding out the person didn't have TB.
- Linking patients with resources to ensure their needs are met and they receive the medical care/services they need.
  - Supplies and support for a new baby
- Using all available means to ensure children are evaluated.
- Ensuring client safety and wellbeing
- Finding creative ways to incentivize clients
- Participating in cohort and case reviews
- Participating in the workload evaluation project

DCLS – TB LAB TEAM

рахмат
danke
謝謝
ngiyabonga
teşekkür ederim
Баярлалаа
спасибо
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tapadh leat
thank you
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vinaka
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misaotra
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grazzi
matondo
хвала
asante
manana
kiitos
dankie
nanni
nandri
dhanyavad
mauruuru
köszönöm
bedankt
bayarlalaa
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hvala
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dankon
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তোমাকে ধন্যবাদ
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Tuberculosis Epidemiology: A Global, National and Virginia Update

LAURA R. YOUNG, MPH, CIC

TB EPIDEMIOLOGIST/SURVEILLANCE COORDINATOR

JANE TINGLEY, MPH

LTBI EPIDEMIOLOGIST

MARCH 24, 2021

Overview

Global Tuberculosis (TB) Update

National TB Update*

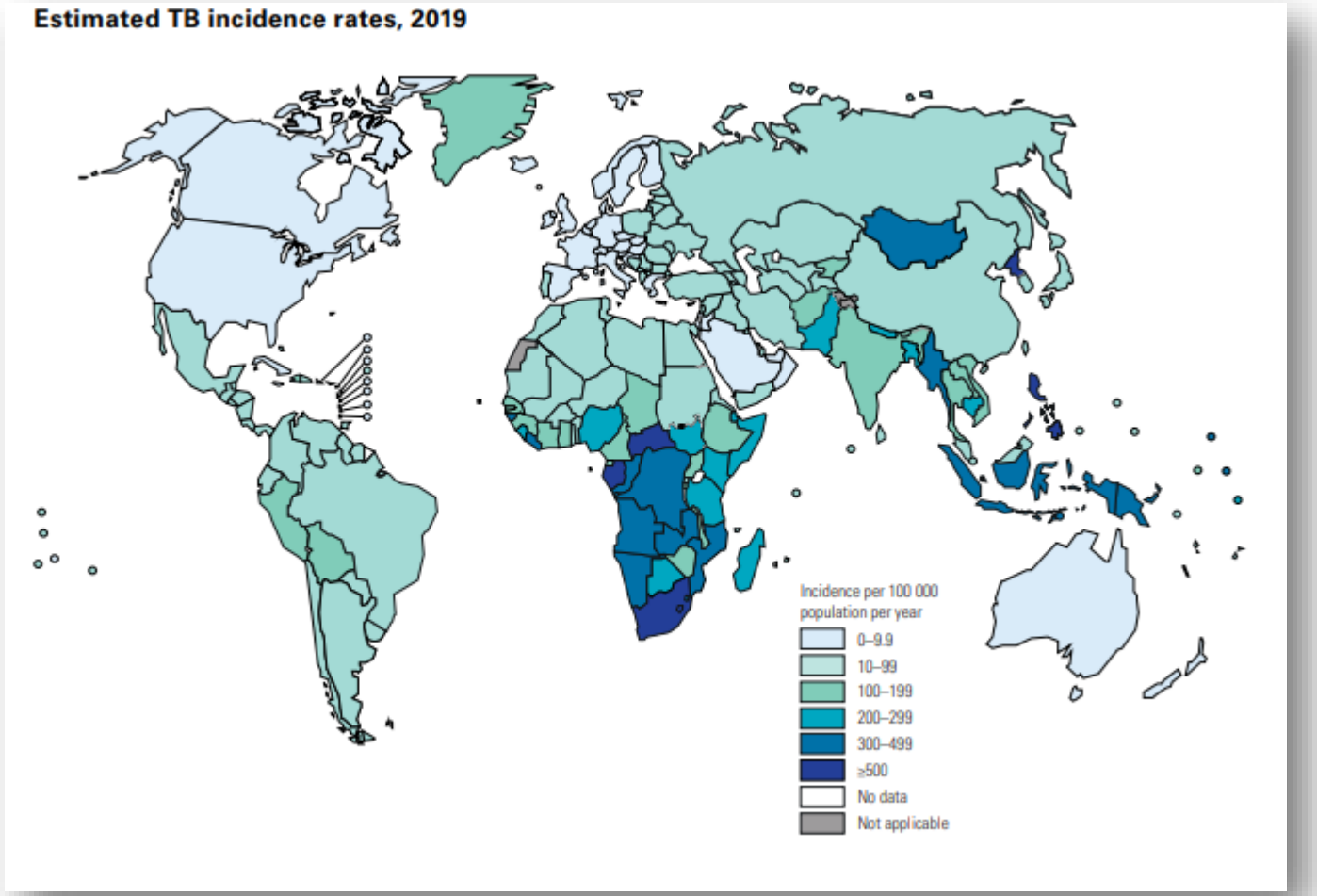
State TB Update*

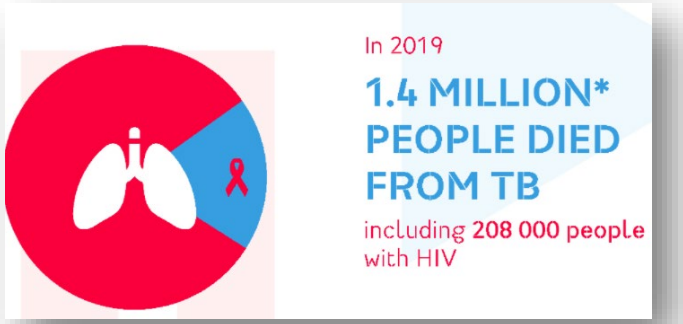
LTBI Update*

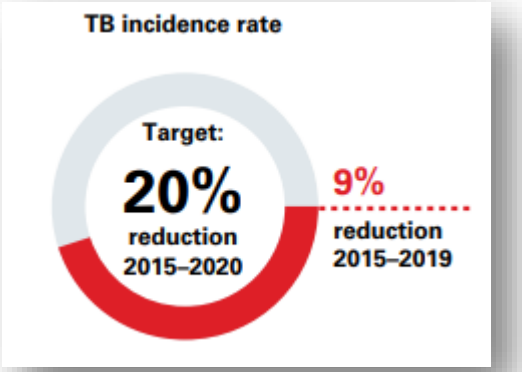
**Please note that all 2020 data is provisional*

Global Tuberculosis Incidence

- In 2019 there were an estimated 10 million new TB cases.
- TB is the leading cause of death worldwide from a single infectious agent
- Eight countries accounted for two thirds of the global total: India, Indonesia, China, the Philippines, Pakistan, Nigeria, Bangladesh and South Africa
- Nearly one in ever four people in the world is infected with latent TB



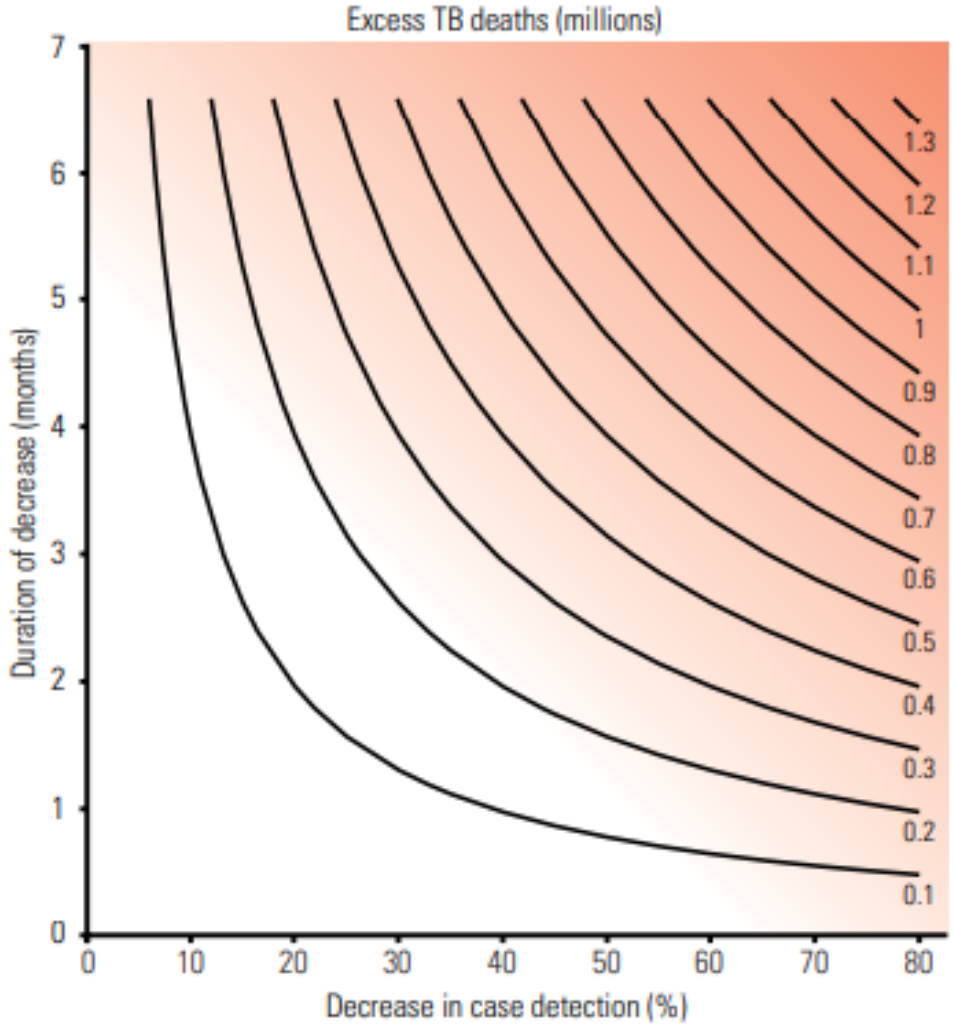




Global COVID-19 Pandemic and TB

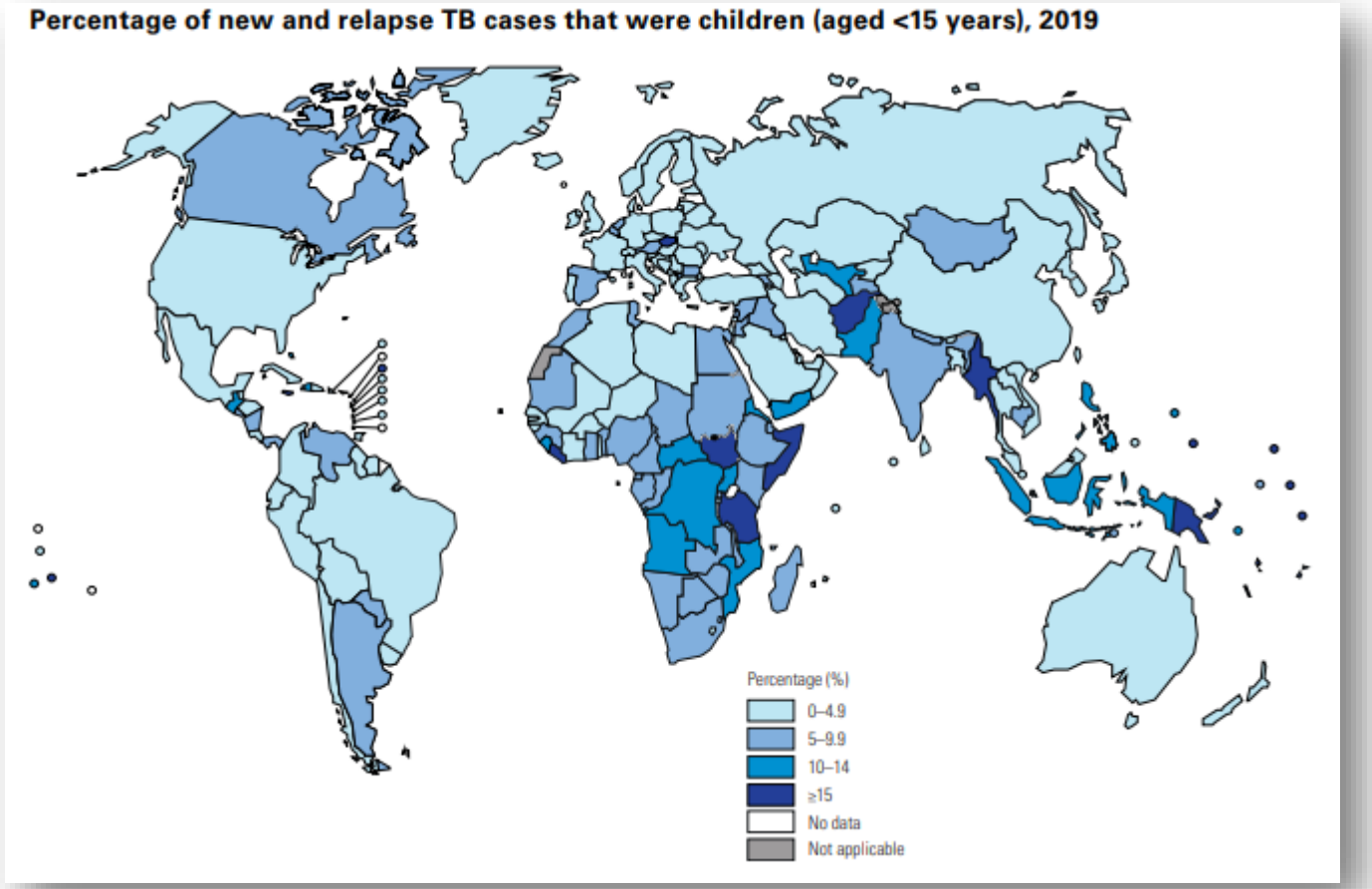
- Modelling has suggested that the number of people developing TB could increase by more than 1 million per year in 2020–2025
- Estimated increases in TB deaths could be 0.2-0.4 million in 2020 alone
- The economic impact is predicted to worsen at least two of the key determinants of TB incidence: GDP per capita and undernutrition

Estimated impact of the COVID-19 pandemic on the global number of TB deaths in 2020, for different combinations of decreases in case detection and the duration of these decreases



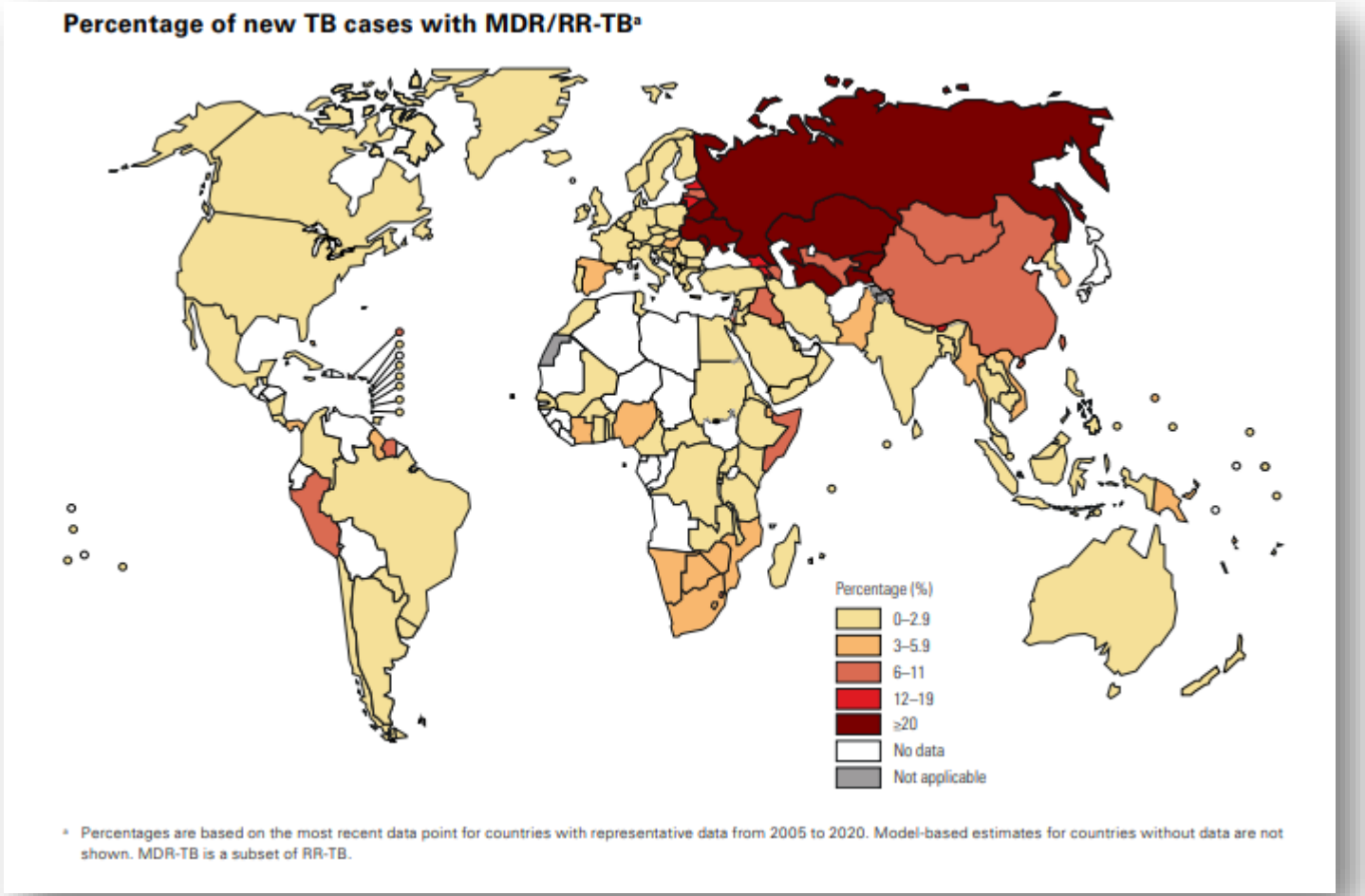
Pediatric Tuberculosis

- Children accounted for an estimated 12% of TB cases in 2019
- Among HIV-negative TB-related deaths in 2019, 16% were children and among HIV-positive TB - related deaths, 17% were children
- Globally in 2019, an estimated 1.3 million children aged under 5 years were household contacts of bacteriologically confirmed pulmonary TB cases



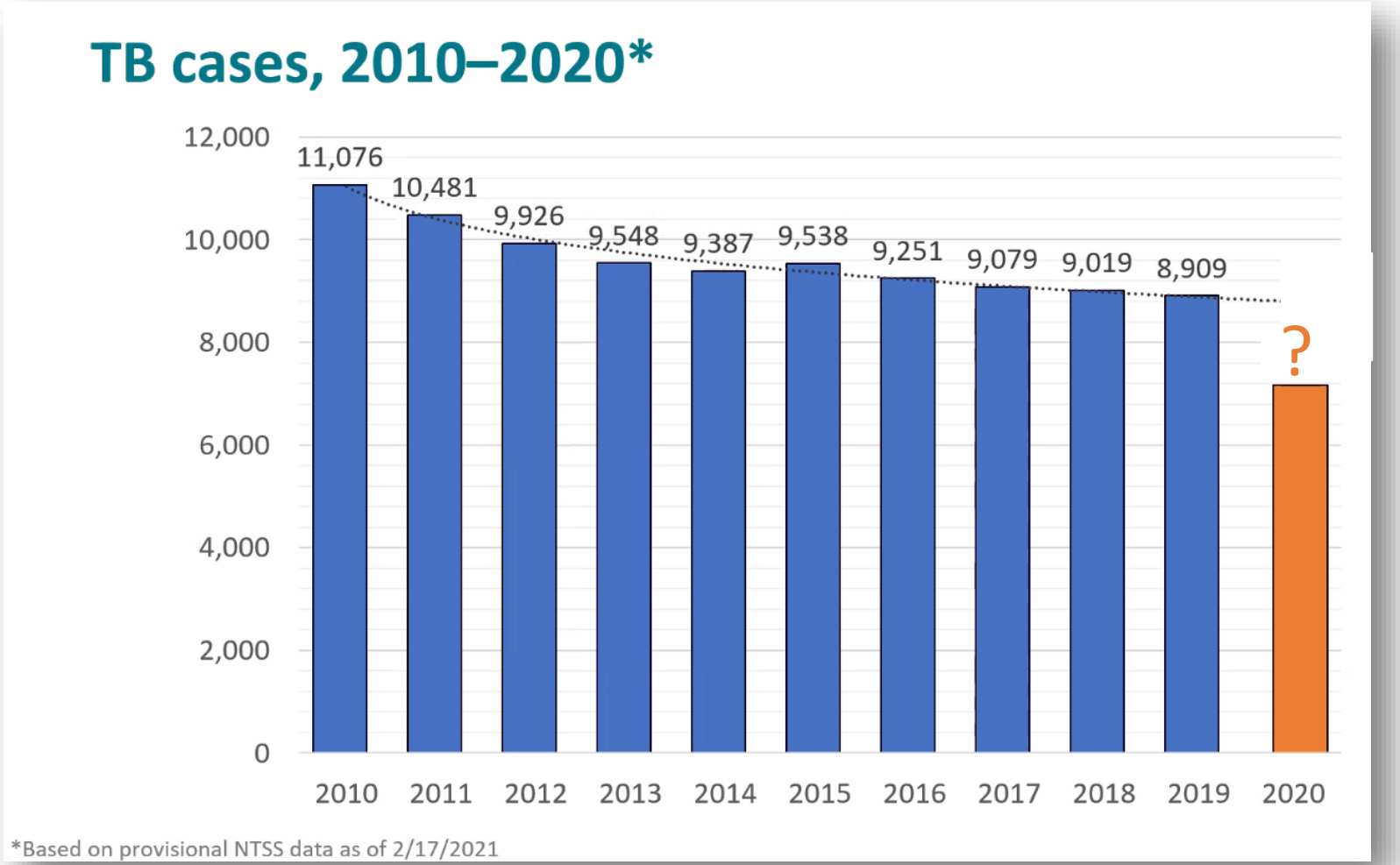
Global MDR/RR-Tuberculosis

- There were an estimated 465,000 incident cases of MDR/RR-TB in 2019
- Nearly 50% of cases were in India (27%), China (14%) and Russie (8%)
- There were about 182,000 deaths from MDR/RR-TB in 2019



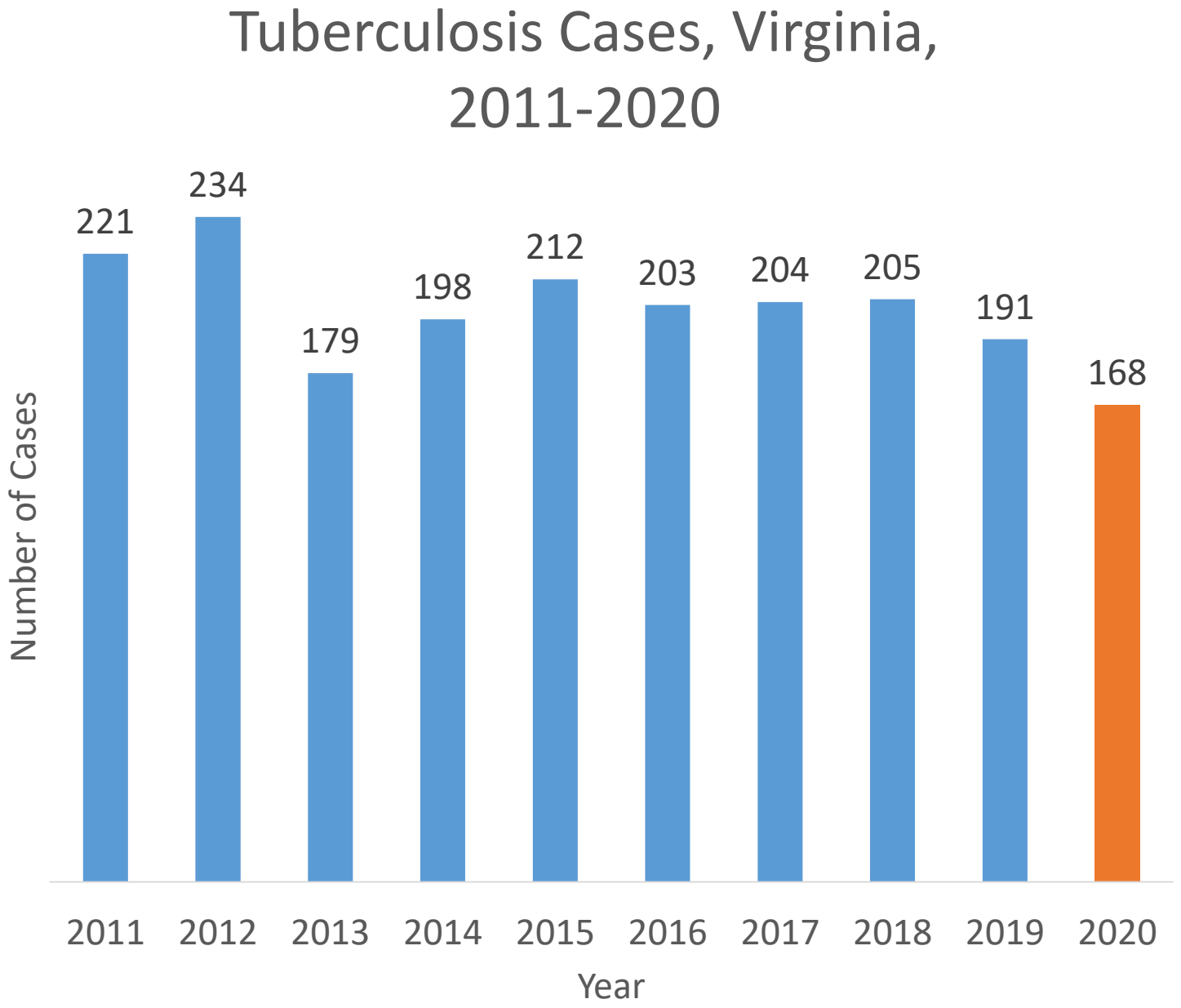
Tuberculosis in the United States, 2020
(2020 data is embargoed until 3/25/2021)

- Provisional 2020 United States case count: ?
- Provisional 2020: United States case rate: ?
- Likely the lowest rate and number of TB cases on record

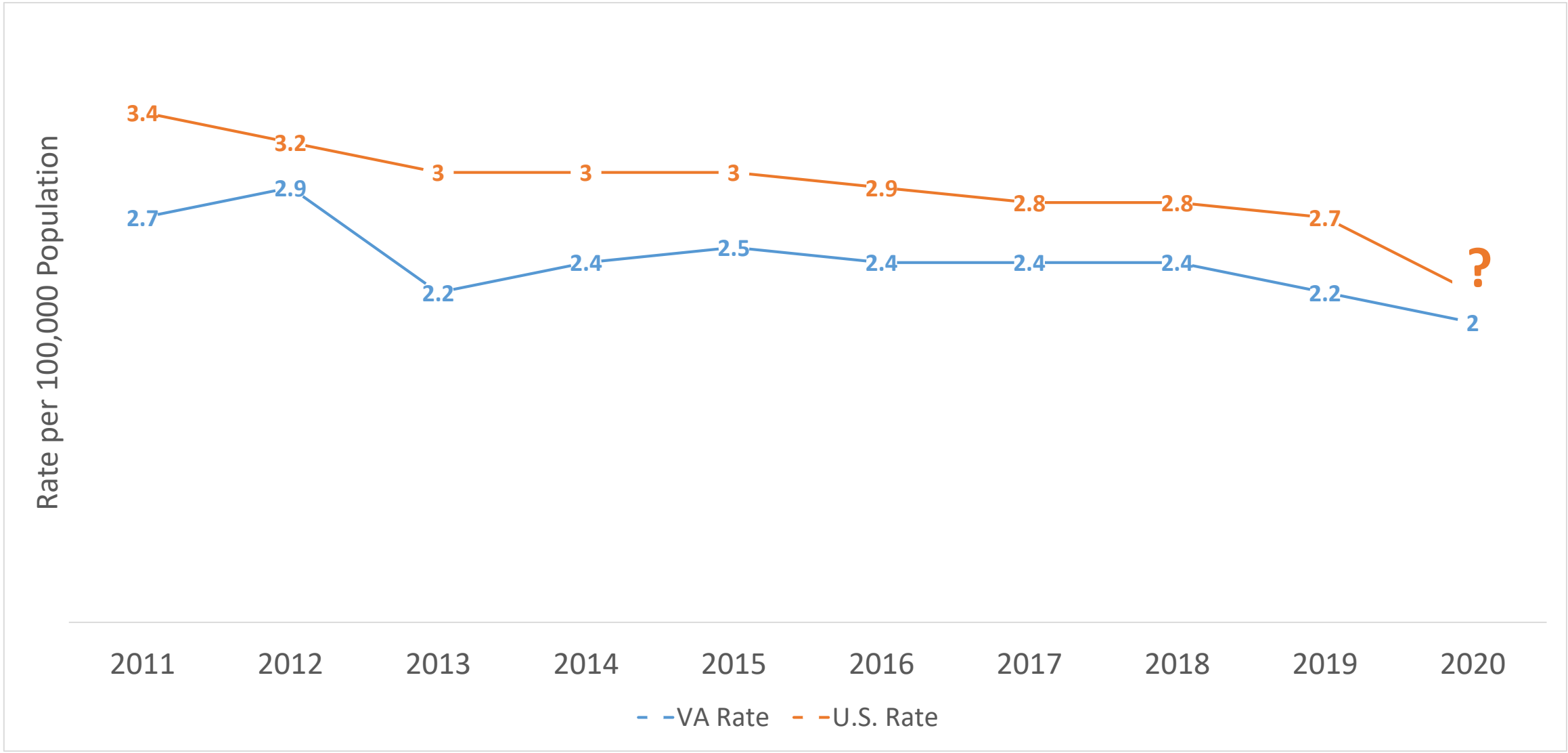


Tuberculosis in Virginia, 2020

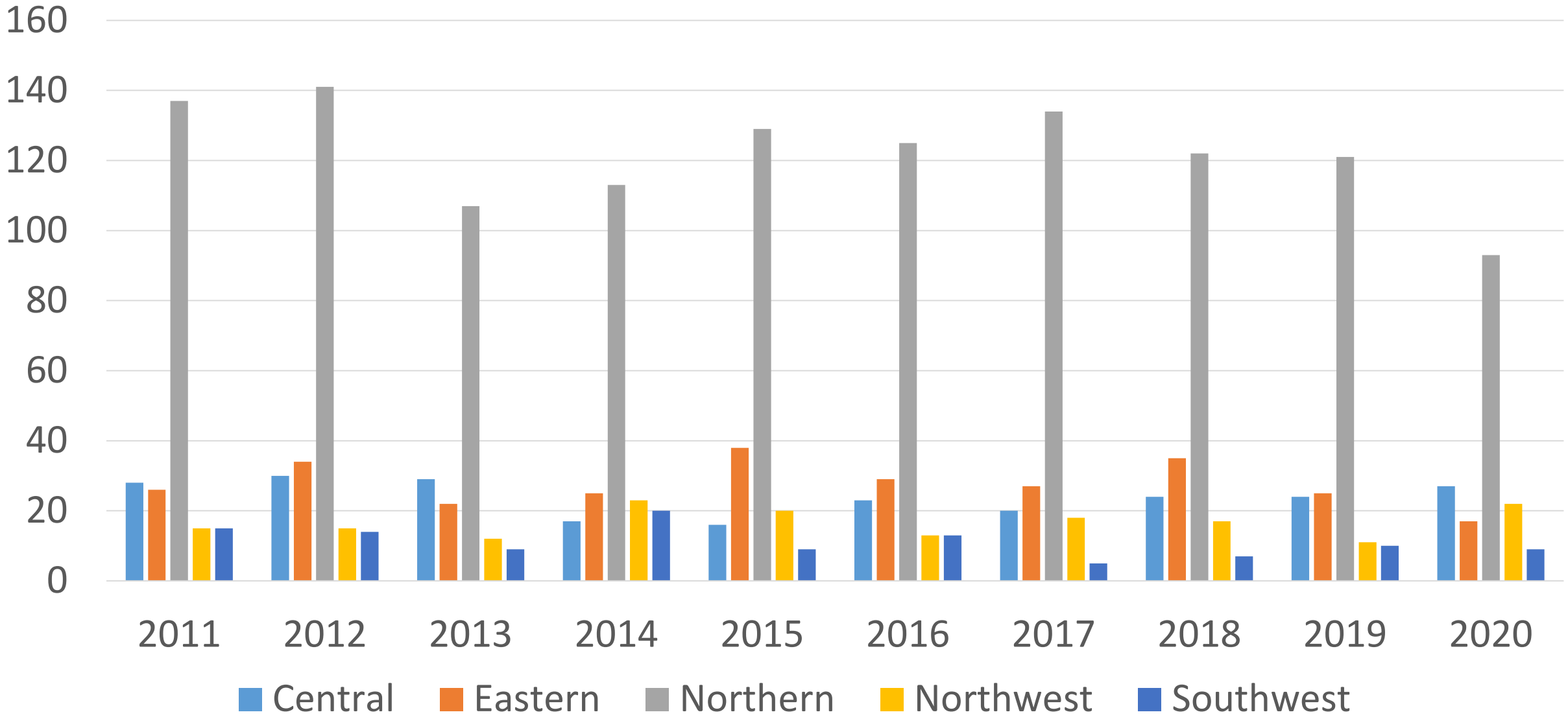
- 168 cases in 2020
- Rate of 2 per 100,000 population



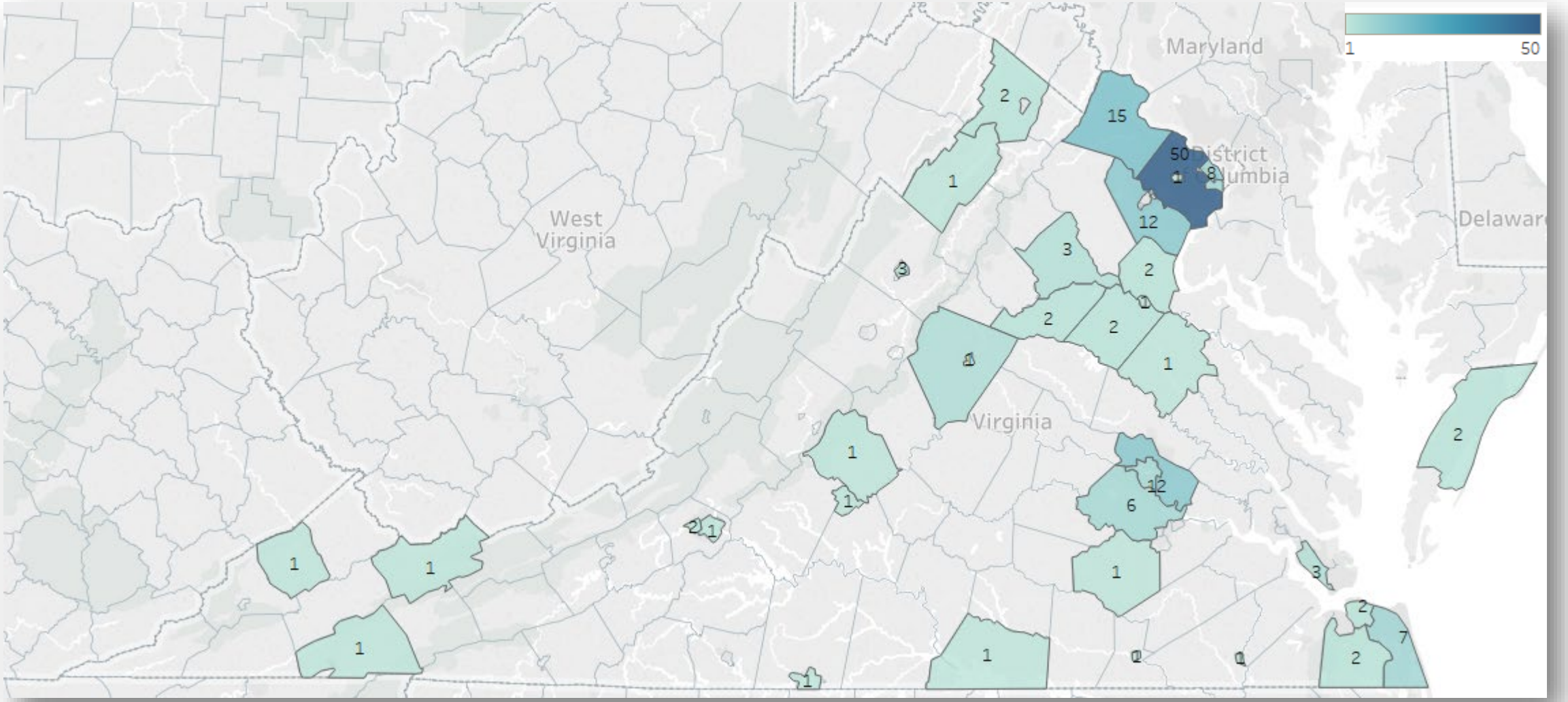
Tuberculosis Incidence Rate, Virginia and the United States, 2011-2020

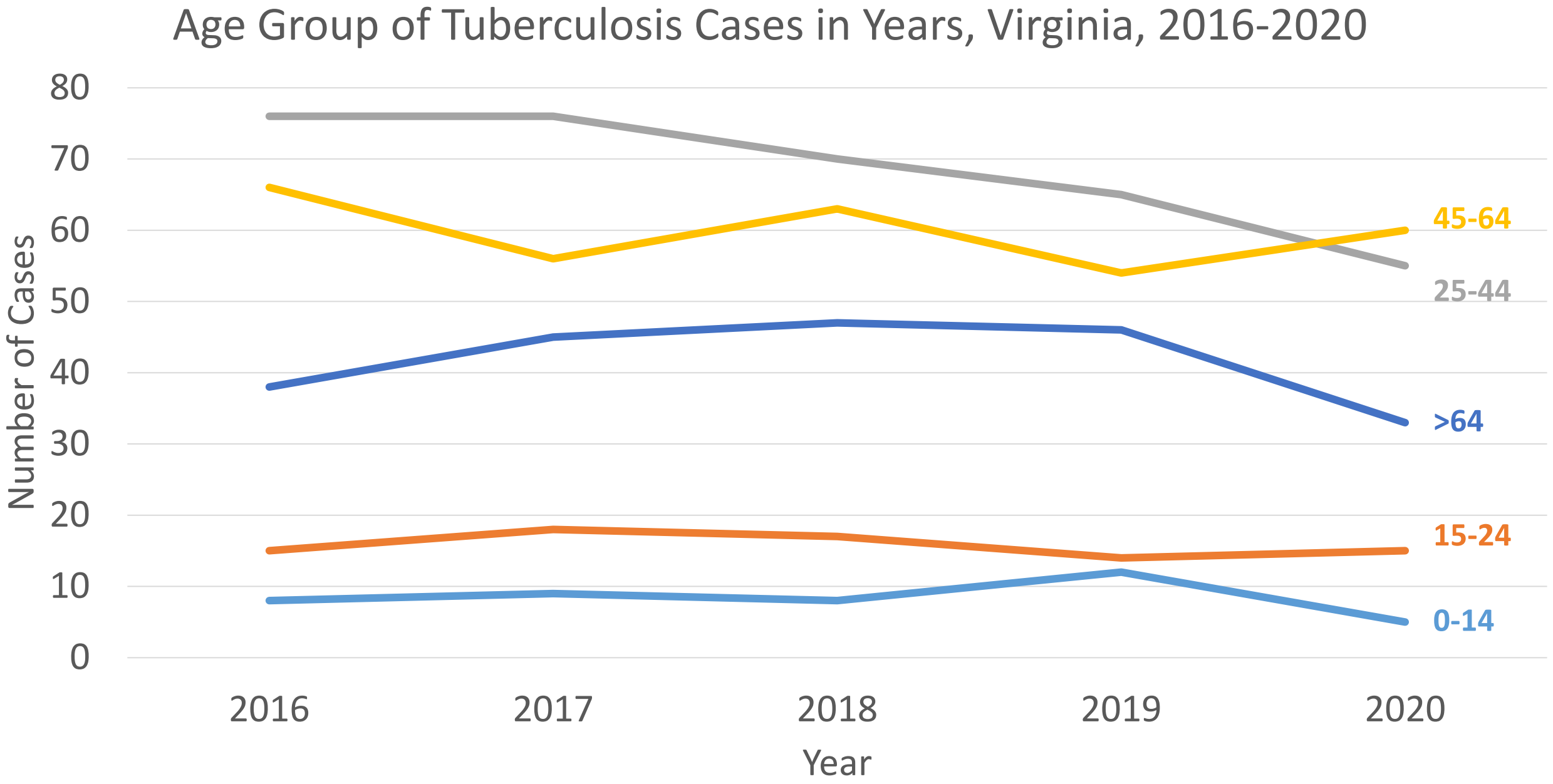


Tuberculosis Case Distribution by Region, Virginia, 2011-2020

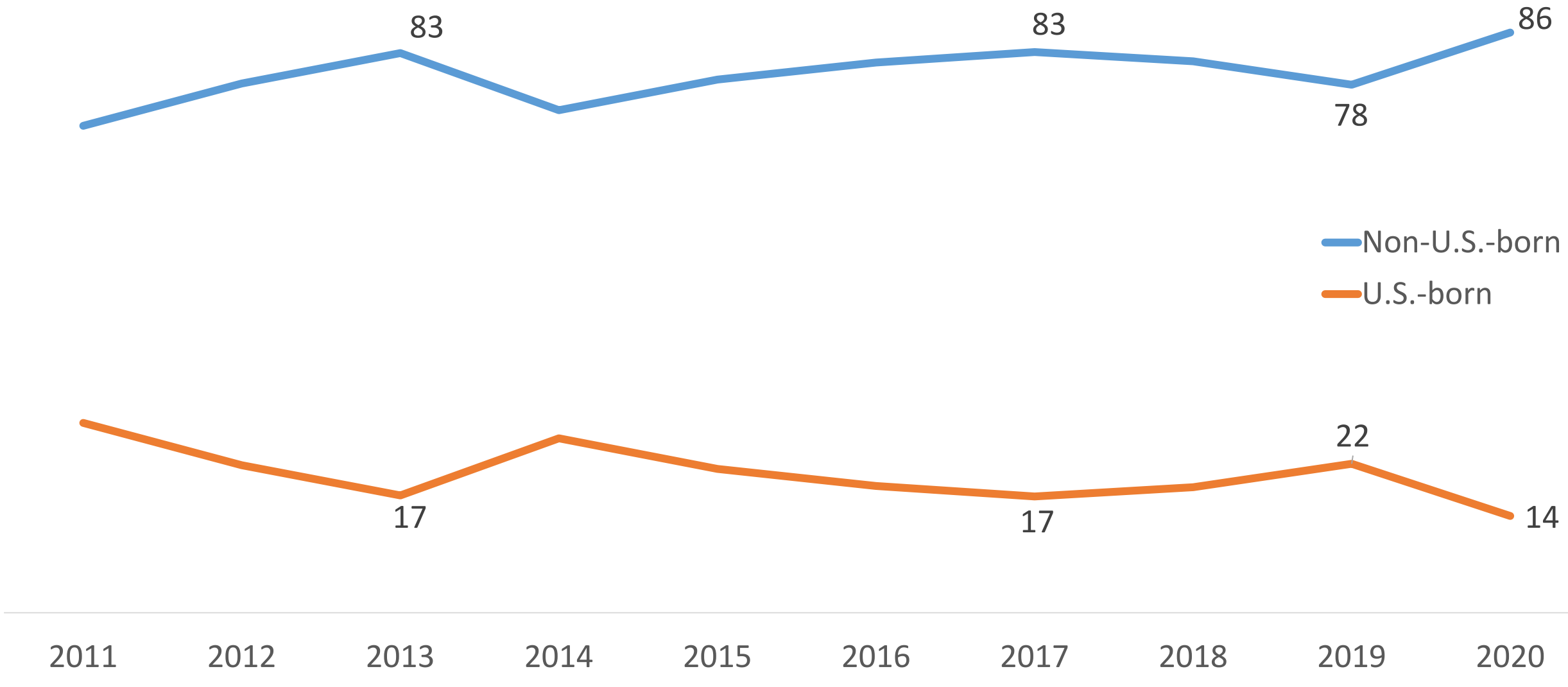


Tuberculosis Cases by City/County, Virginia, 2020

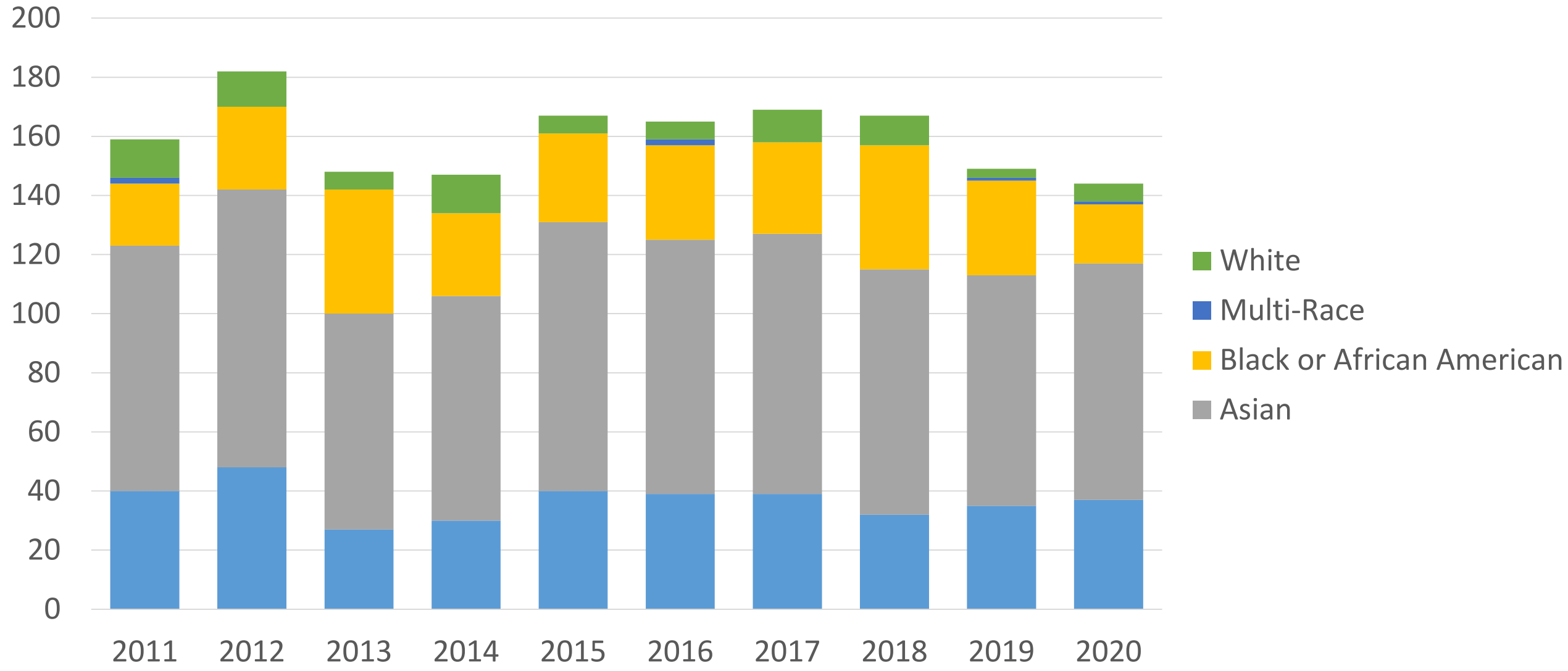



Age Group of Tuberculosis Cases in Years, Virginia, 2016-2020
Number of Cases
80
70
60
50
40
30
20
10
0
2016
2017
2018
2019
2020
Year
45-64
25-44
>64
15-24
0-14

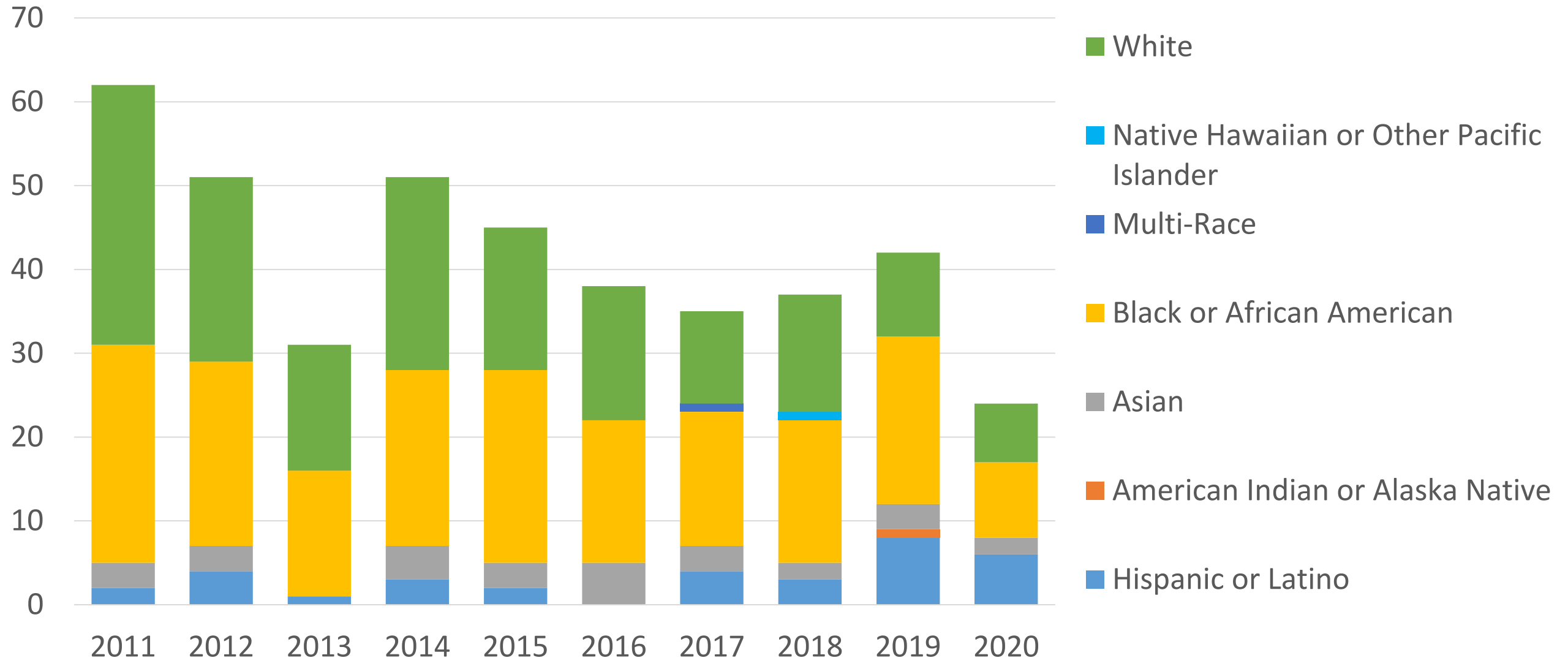
Percent of Total Tuberculosis Cases by Nativity, Virginia, 2011-2020



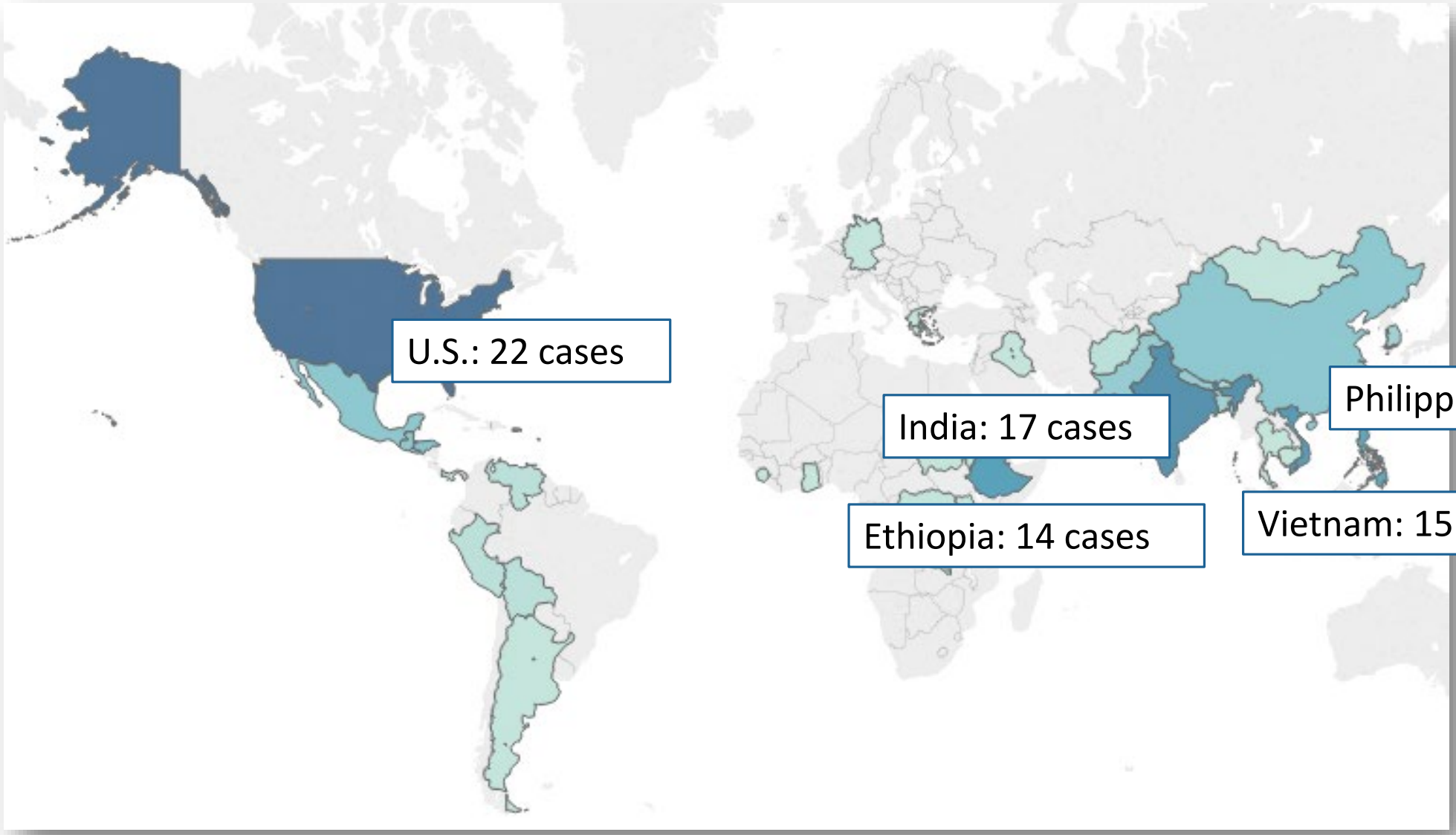
Tuberculosis Cases by Race and Ethnicity Among Non-U.S.-Born Case, Virginia, 2011-2020



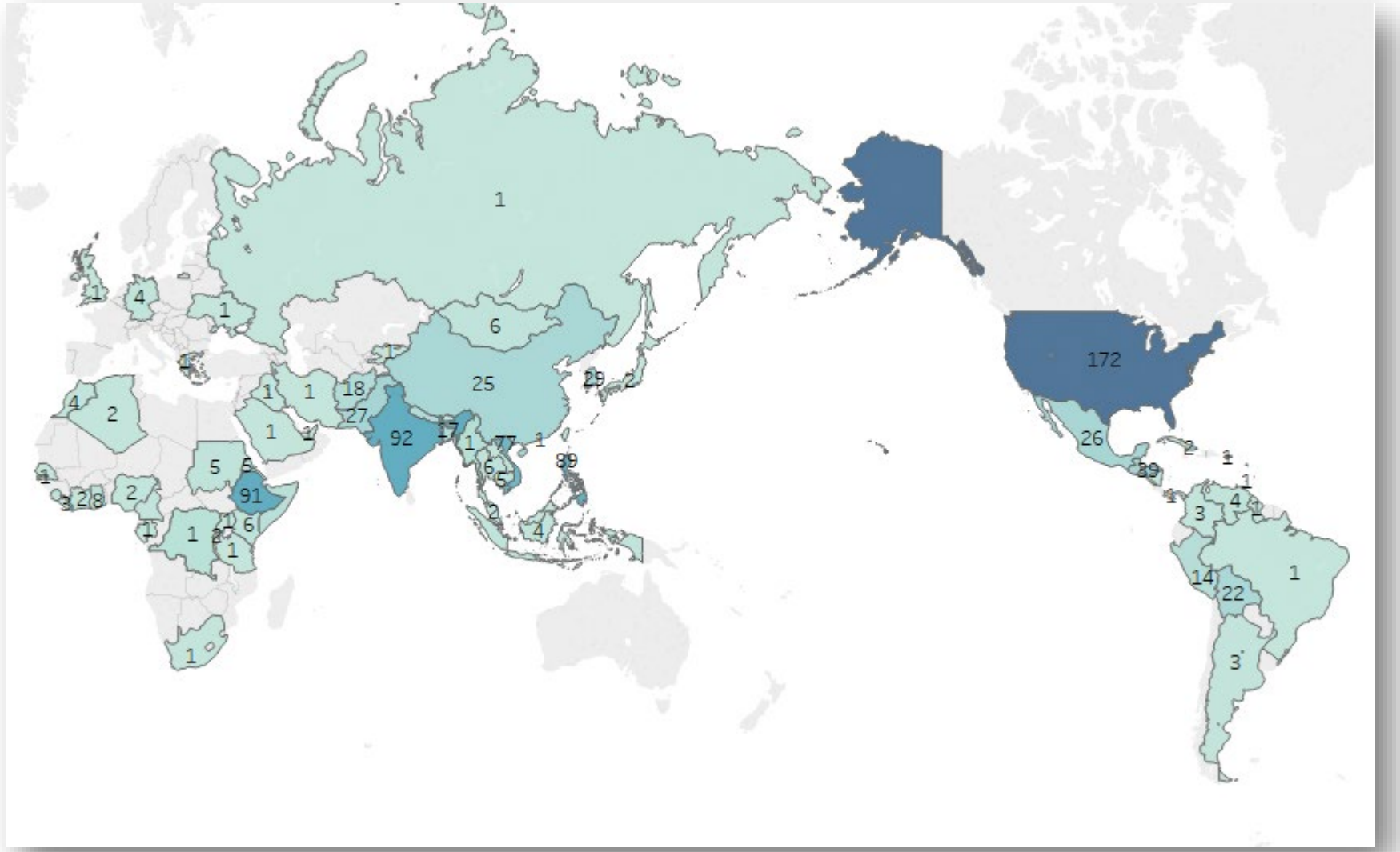
Tuberculosis Cases by Race and Ethnicity Among U.S.-Born Cases, Virginia, 2011-2020



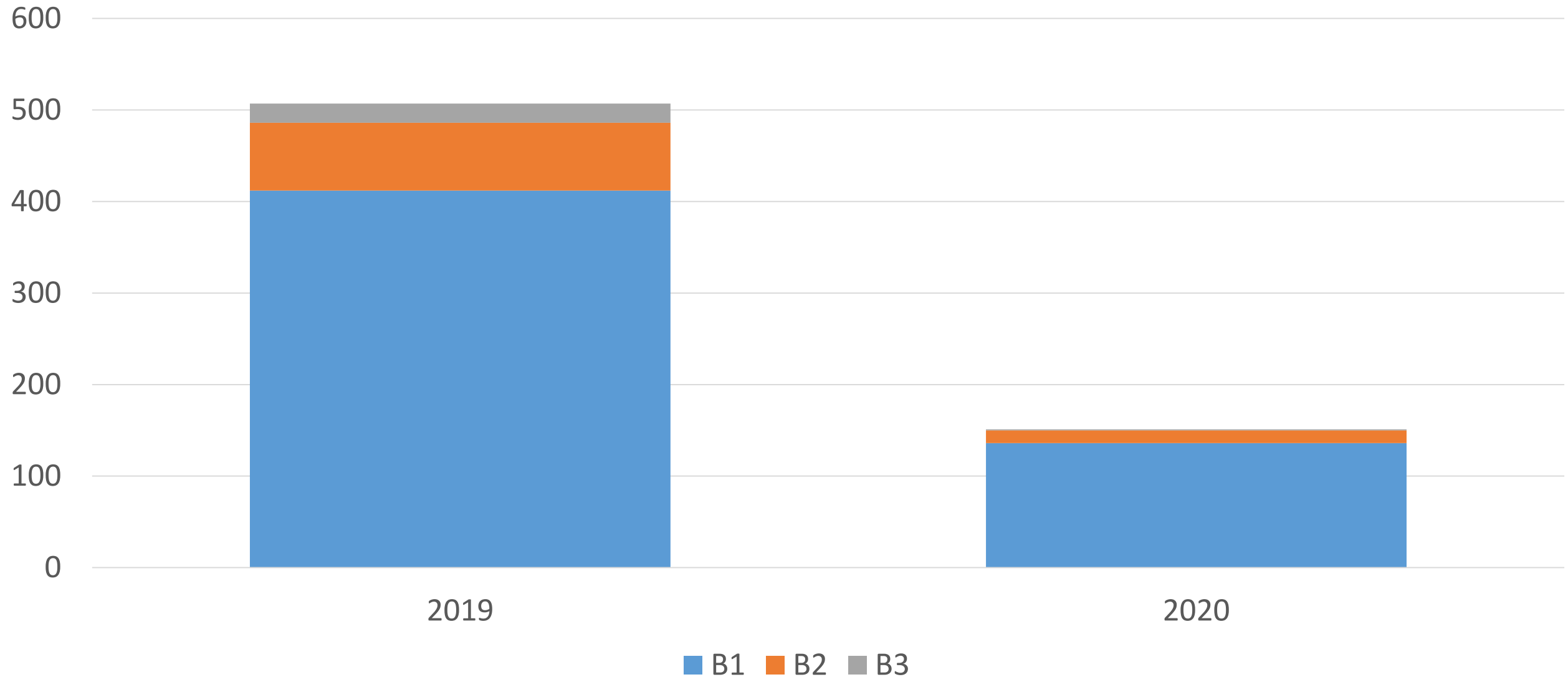
County of Birth of Tuberculosis Cases, Virginia, 2020



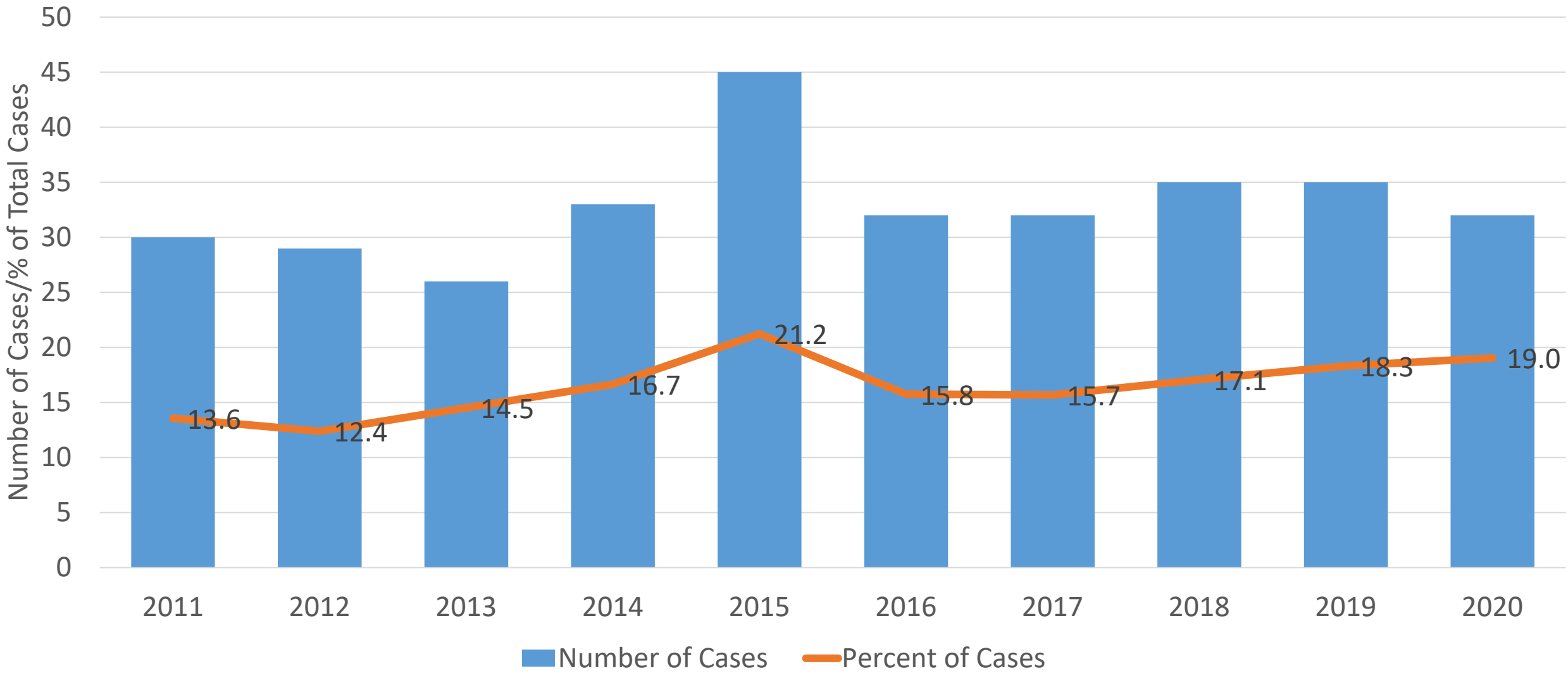
Countries of Birth of Tuberculosis Cases, Virginia, 2016-2020

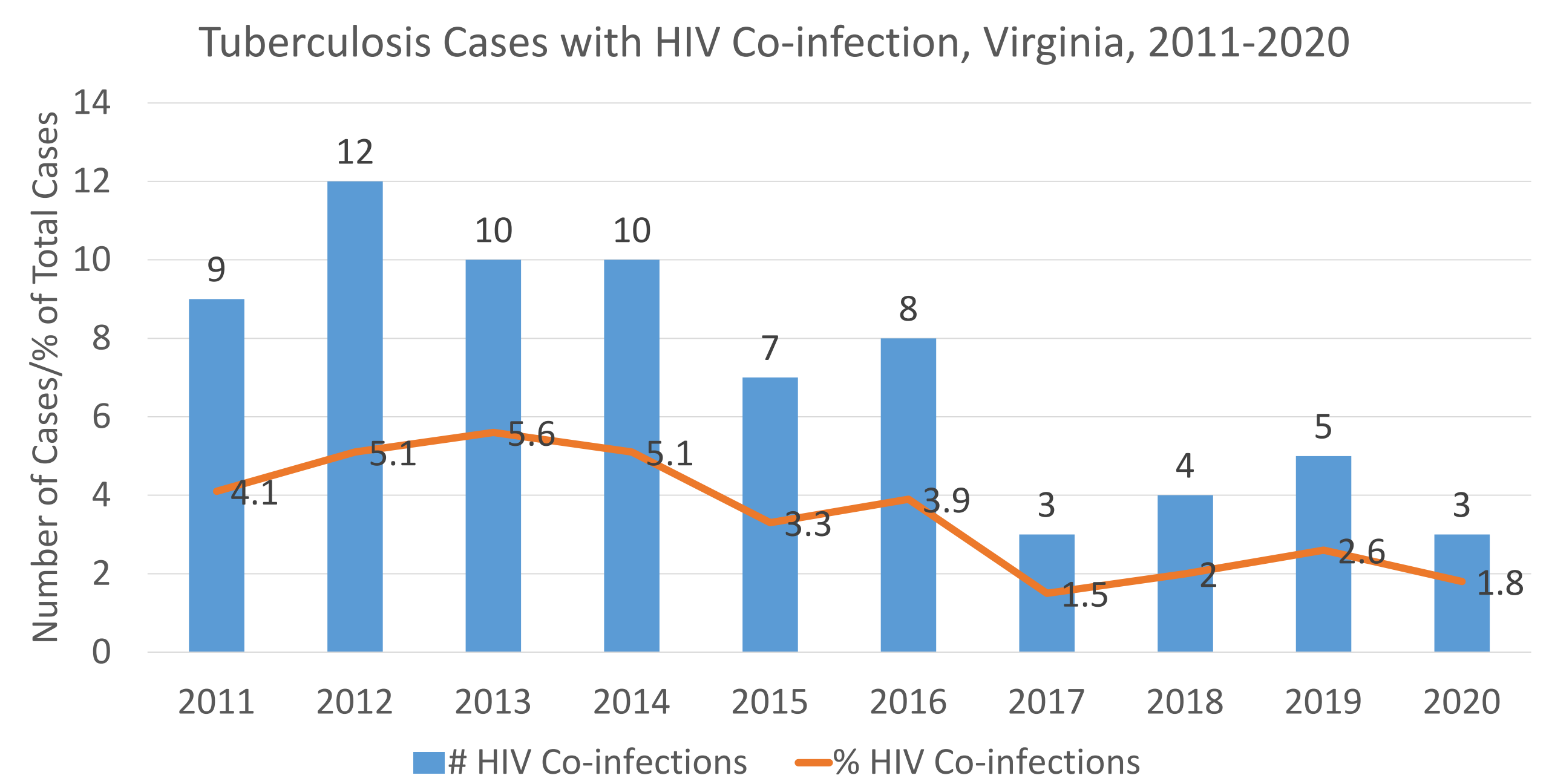


Tuberculosis Class B Arrivals to Virginia, 2019 and 2020

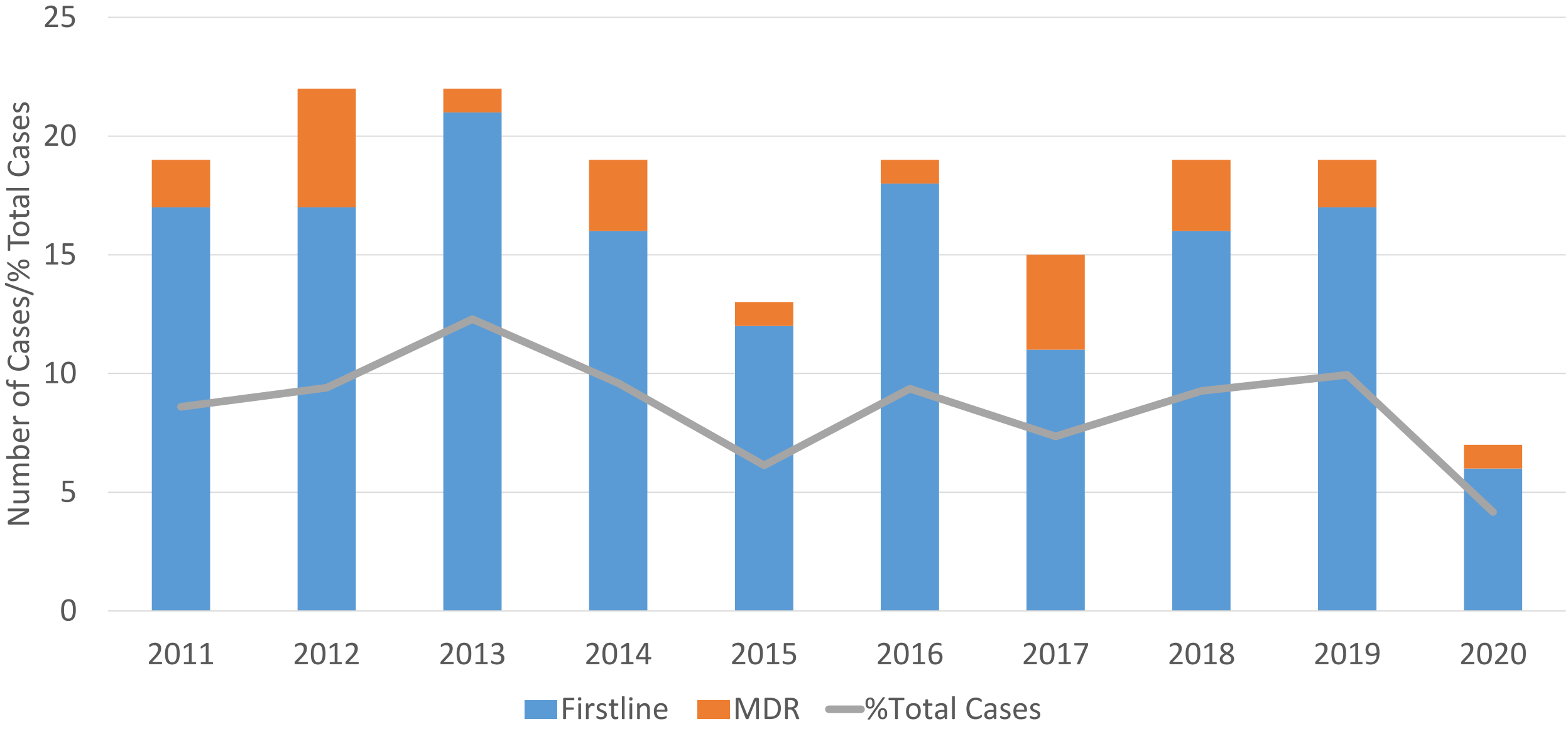


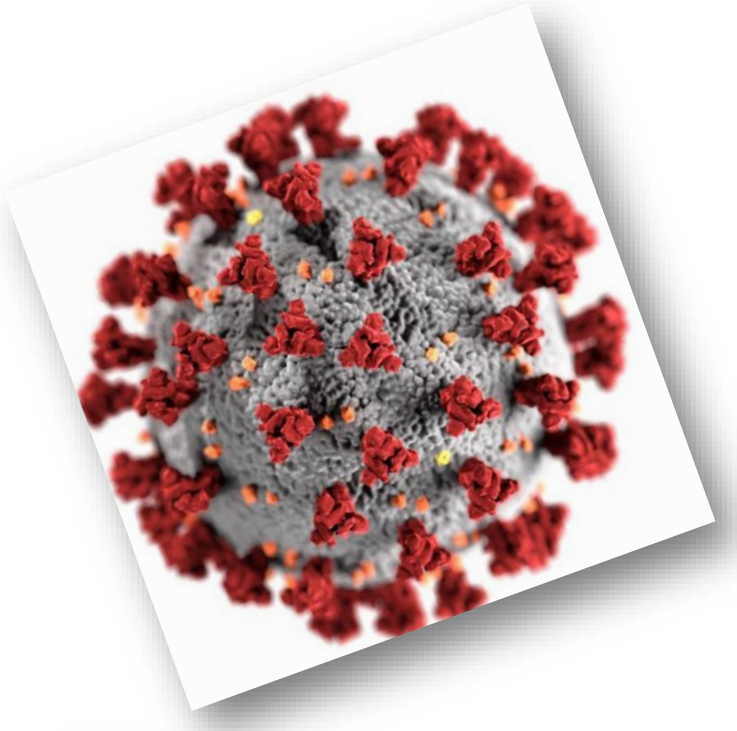
Number and Percent of Tuberculosis Cases with Diabetes, Virginia, 2011-2020

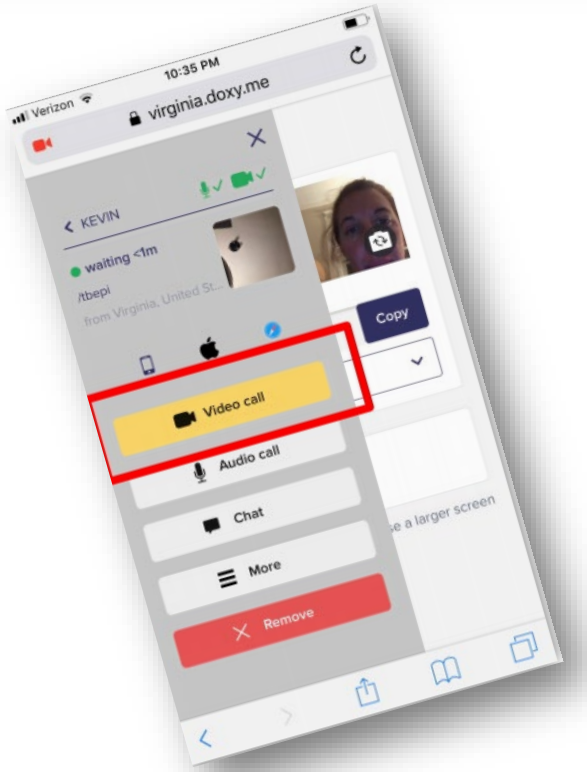



Tuberculosis Cases with HIV Co-infection, Virginia, 2011-2020
Number of Cases/% of Total Cases
0
2
4
6
8
10
12
14
9
12
10
10
7
8
3
4
5
3
4.1
5.1
5.6
5.1
3.3
3.9
1.5
2
2.6
1.8
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
HIV Co-infections
% HIV Co-infections

Drug Resistance Among Tuberculosis Cases, Virginia, 2011-2020



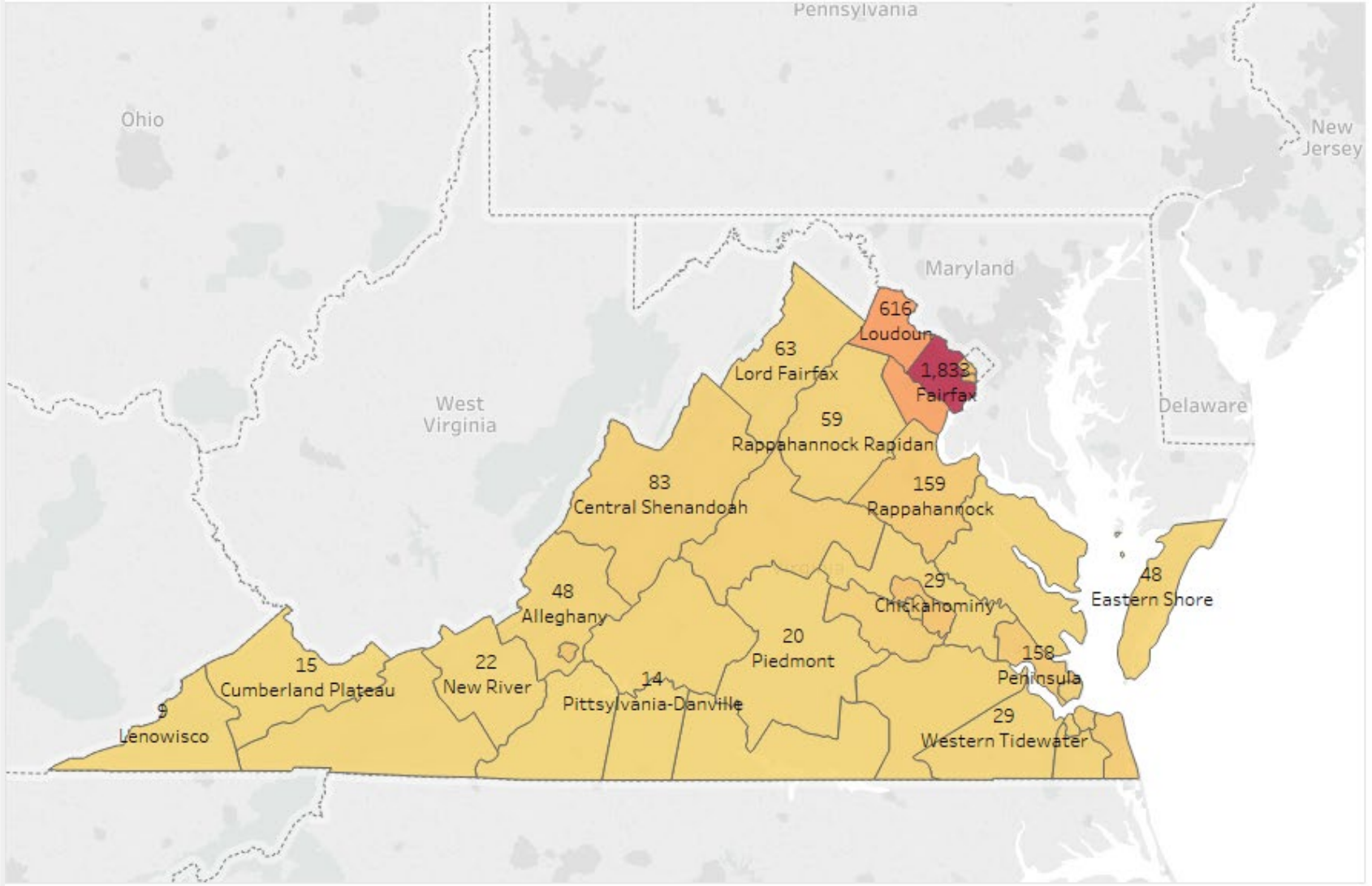



Verizon
10:35 PM
virginia.doxy.me
KEVIN
waiting <1m
/tbepl
from Virginia, United St...
Copy
Video call
Audio call
Chat
More
Remove
e a larger screen


NIOSH
3M 1860S
N95
HEALTH CARE PARTICULATE RESPIRATOR
AND SURGICAL MASK

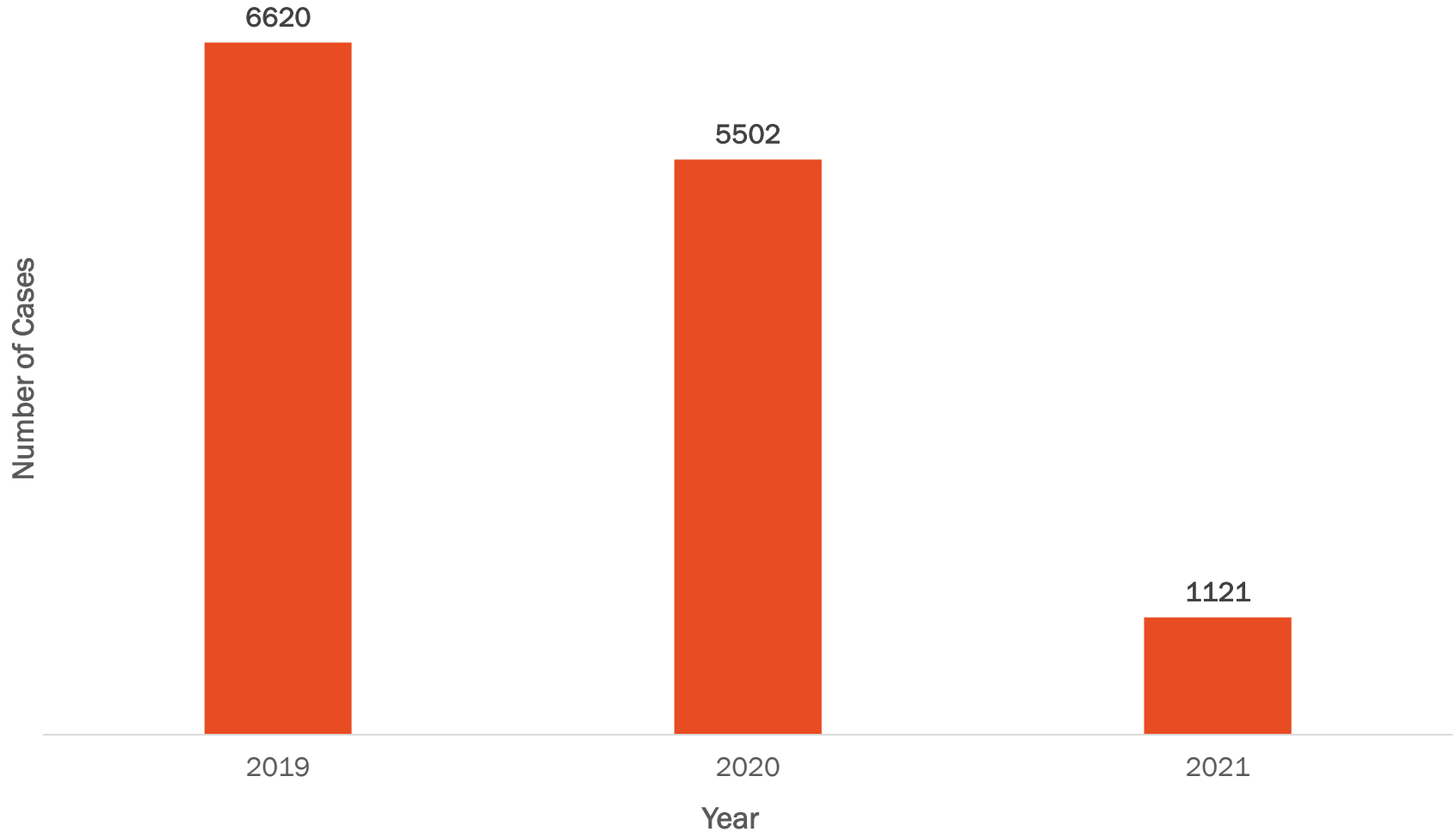
LTBI in Virginia

New Reported Cases of LTBI By District of Residence, Virginia, 2020

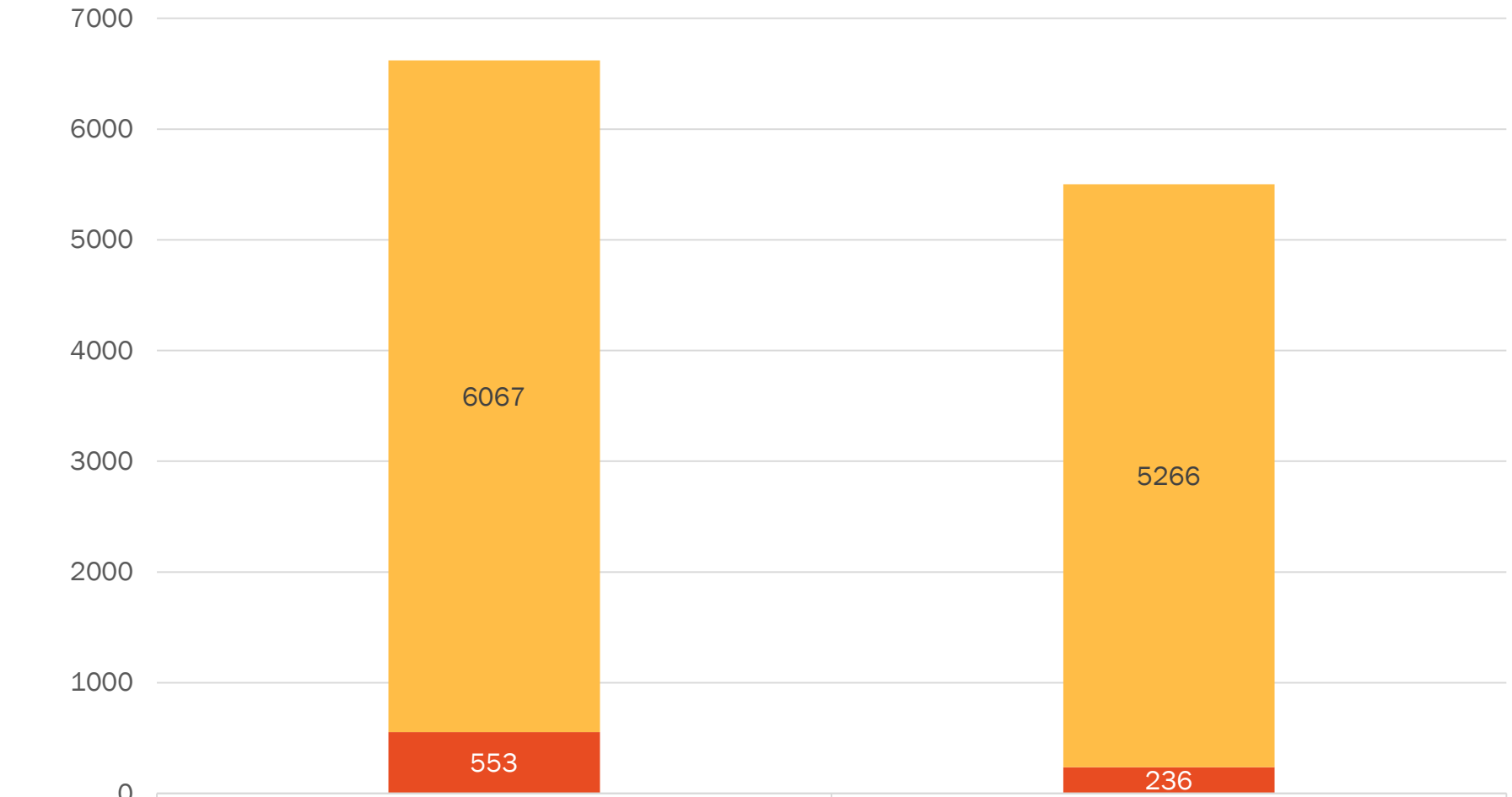


Map based on Longitude (generated) and Latitude (generated). Color shows sum of Number of Records. The marks are labeled by sum of Number of Records and District. Details are shown for First Dist. The data is filtered on Case Status1 and MMWR Year1. The Case Status1 filter keeps Confirmed, Probable and Suspect. The MMWR Year1 filter ranges from 2020 to 2020.

LTBI Cases in Virginia, 2019-2021

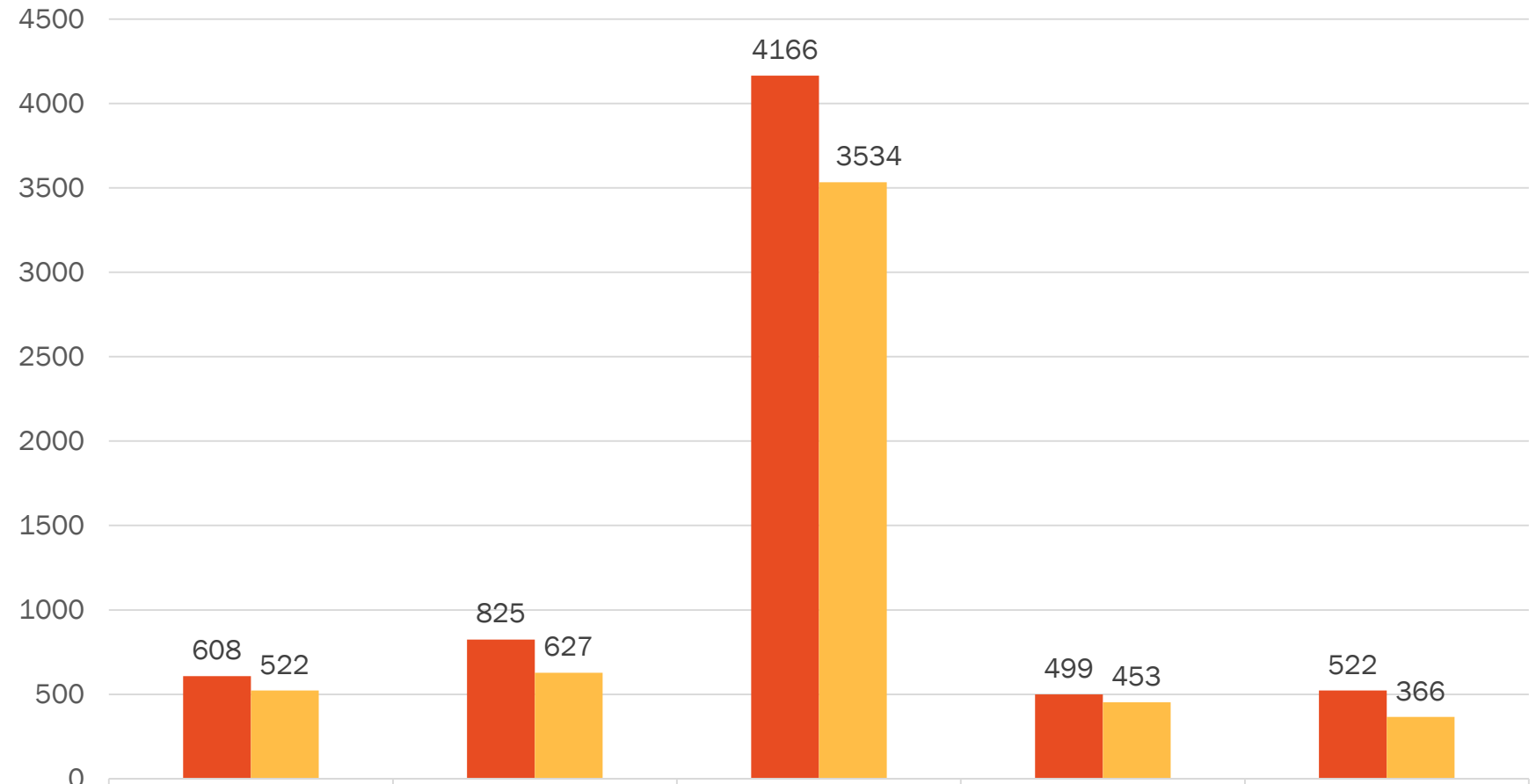


LTBI Cases by Case Status, Virginia, 2019-2020

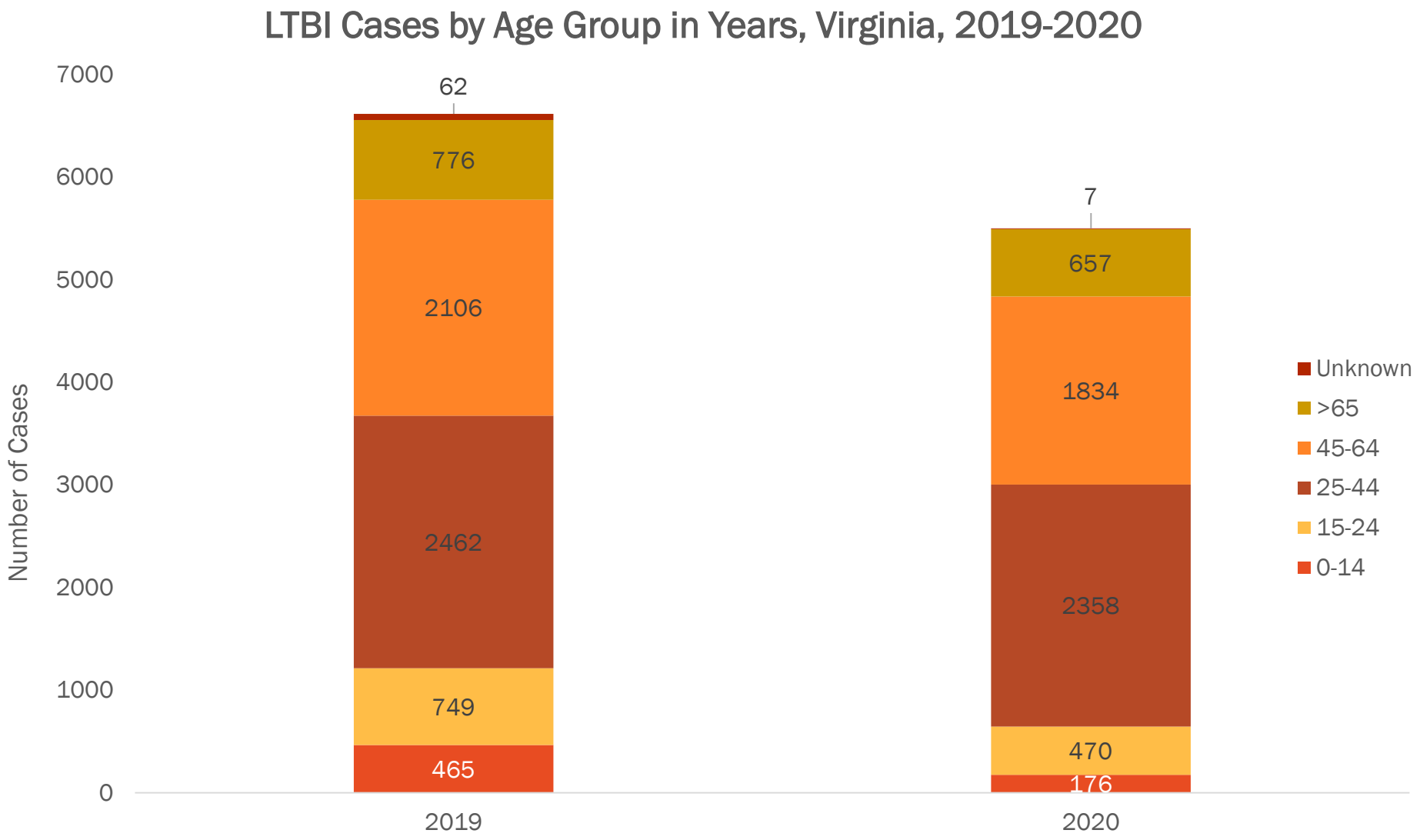


	2019	2020
Suspect	6067	5266
Confirmed	553	236

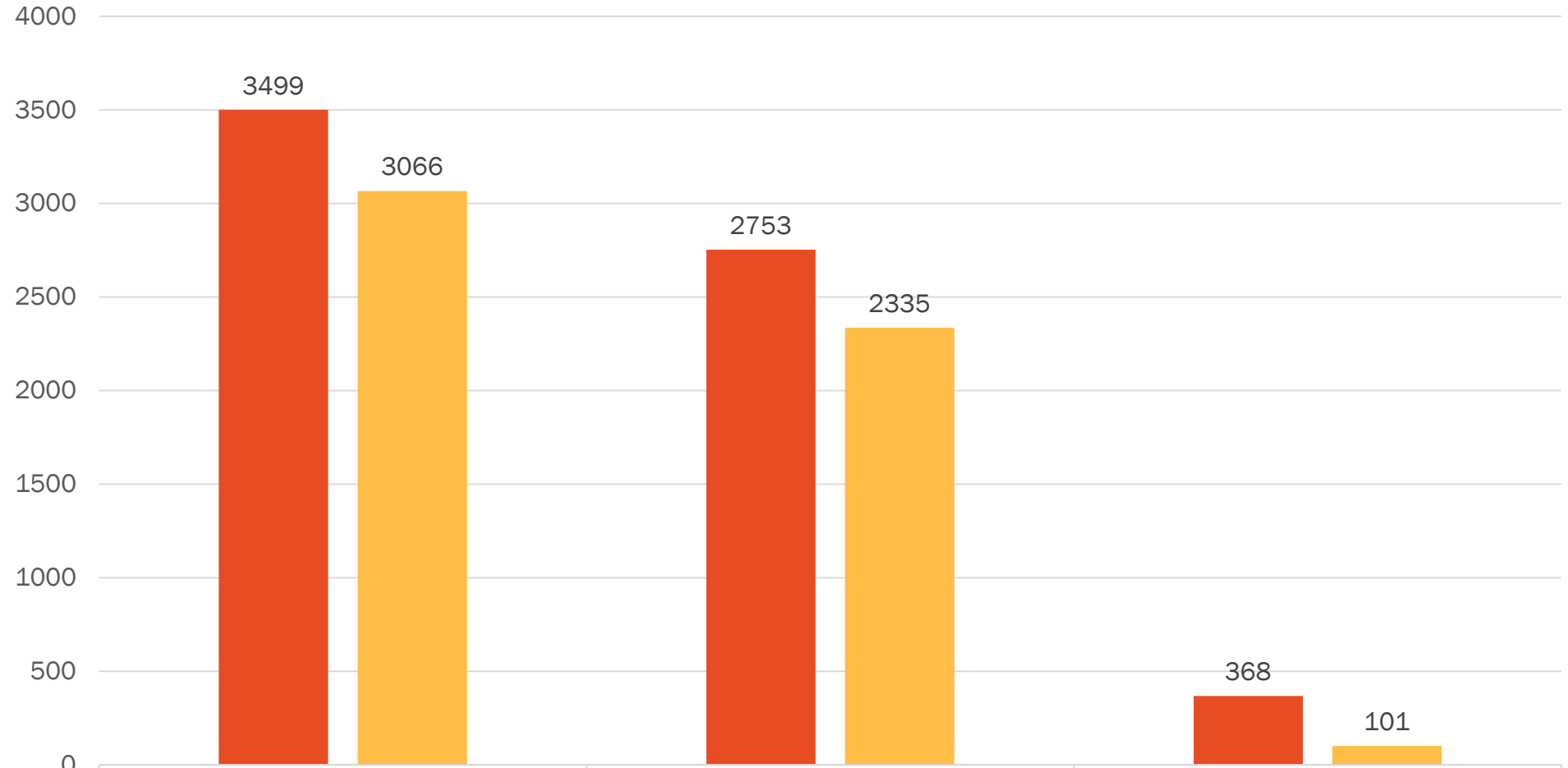
LTBI Case Distribution by Region, Virginia, 2019-2020



	Central	Eastern	Northern	Northwest	Southwest
2019	608	825	4166	499	522
2020	522	627	3534	453	366


LTBI Cases by Age Group in Years, Virginia, 2019-2020
Number of Cases
7000
6000
5000
4000
3000
2000
1000
0
62
776
2106
2462
749
465
7
657
1834
2358
470
176
2019
2020
Unknown
>65
45-64
25-44
15-24
0-14

LTBI Cases by Sex, Virginia, 2019-2020



	Female	Male	Unknown
2019	3499	2753	368
2020	3066	2335	101

Top Five Reporters for LTBI - 2020

1. LabCorp (1,970)
2. Quest Teterboro (1,320)
3. Quest Diagnostics – Chantilly (472)
4. Fairfax Public Health Laboratory (365)
5. Quest Diagnostics – Atlanta (175)

Questions?

Contact Us:
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804-864-7922

Jane C. Tingley, MPH
LTBI Epidemiologist
jane.tingley@vdh.Virginia.gov
804-864-7921

References

World TB Day — March 24, 2020. MMWR Morb Mortal Wkly Rep 2020;69:281. http://dx.doi.org/10.15585/mmwr.mm6911a1

Global Tuberculosis Report, 2020. World Health Organization. Global tuberculosis report 2019. Geneva: World Health Organization; 2020. License: CC BY-NC-SA 3.0 IGO.

COVID-19 AND TUBERCULOSIS HANDOUT

COVID-19 and Tuberculosis

The coronavirus (or COVID-19) pandemic has made the focus on tuberculosis (or TB) prevention and treatment more necessary and urgent in the state of Virginia.

COVID-19 < **VS** > **TB**

COVID-19 is a respiratory illness caused by a virus that can spread from person-to-person

TB is a serious and sometimes deadly illness caused by bacteria that usually attacks the lungs, but can also affect other parts of the body

Additional COVID-19 Symptoms

Symptoms may develop **2-14 days** after exposure

Other possible symptoms:

- new loss of taste or smell
- sore throat
- congestion or runny nose
- nausea or vomiting
- muscle or body aches
- diarrhea
- bilateral abnormalities on chest x-ray

Shared Symptoms of TB Disease and COVID-19

Both COVID-19 and TB may cause:

- **cough**
- **shortness of breath**
- **fever**
- **chills**
- **fatigue**
- **chest pain**
- **abnormal chest x-ray**

Both can spread when an infected person coughs, sneezes, sings, or talks

Additional TB Disease Symptoms

Symptoms may develop after **weeks to years** if not treated for latent TB infection

Other possible symptoms:

- night sweats
- coughing up blood or phlegm
- weight loss
- unilateral abnormalities on chest x-ray

Who is at a Higher Risk for TB?

- People who have **lived in or visited another country** other than the United States, Canada, Australia, New Zealand, or Western and Northern Europe
- Those who have a **weakened immune system** (e.g., HIV, organ transplant, cancer, diabetes, etc.)
- History of **close contact** to someone who has TB disease
- People who have experienced **homelessness or been incarcerated**

Recommendations

- Test for TB in individuals with **TB risk factors**
- Encourage and initiate appropriate **treatment**
- Test for COVID-19 in individuals with a **new cough**
- Encourage **physical distancing** and **wearing a mask** when around others
- Encourage frequent **hand washing** and **surface disinfection**
- Encourage COVID-19 vaccination

Where to Get Tested/More Information

- Info on COVID-19: www.vdh.virginia.gov/coronavirus
  - Have questions? Call the VDH hotline 877-ASK-VDH3 (877-275-8343)
  - COVID-19 Testing: www.vdh.virginia.gov/coronavirus/covid-19-testing
- Info on TB: www.vdh.virginia.gov/tuberculosis/tb-disease

Virginia Department of Health
www.vdh.virginia.gov
Adapted from Los Angeles County Department of Public Health "COVID-19 & Tuberculosis" Handout
Revised 02/2021
VDH VIRGINIA DEPARTMENT OF HEALTH

NTM HANDOUT

Nontuberculous Mycobacteria

With over **190 species and subspecies**, nontuberculous mycobacteria (NTM) are on the rise. It is more important than ever to learn about these organisms and how to handle them.

What are they?

NTM are **environmental opportunistic pathogens**.

NTM are organisms that generally live in water, soil, and air. They can cause human infection, particularly of the lung, but can also be laboratory contaminants. *M. gordonae* is usually a contaminant.

Clinical Manifestations

Most common: NTM pulmonary disease

Chronic/recurring cough, sputum production, fatigue, malaise, dyspnea, fever, chest pain, weight loss

Lymphatic

Involved nodes enlarge rapidly, may rupture, not tender

Skin/soft tissue and bone

Localized drainage/abscess at puncture site;
Nosocomial infections - long term catheters, surgical wound infections

Disseminated disease

Seen in immunocompromised hosts;
Fever, night sweats, weight loss, abdominal pain, diarrhea

NTM are grouped by their growth rate in subculture.

Rapid-Growing < VS. > **Slow-Growing**

Growth within 7 days

Most common examples: *M. abscessus* complex, *M. chelonae*, *M. fortuitum*

Growth after 7 days

Most common examples: *M. avium* complex (includes *avium*, *intracellulare*, *chimaera*), *M. kansasii*, *M. xenopi*

NTM with Highest Clinical Significance

1. ***M. avium* complex (MAC)**
   Most common NTM; lung disease is the most common presentation, particularly in elderly females with lung nodules and bronchiectasis
2. ***M. kansasii***
   Closely resembles tuberculosis
3. ***M. abscessus***
   Causes lung disease and other infections, extremely resistant to antibiotics, common in those with cystic fibrosis or non-cystic fibrosis bronchiectasis, including those without smoking history

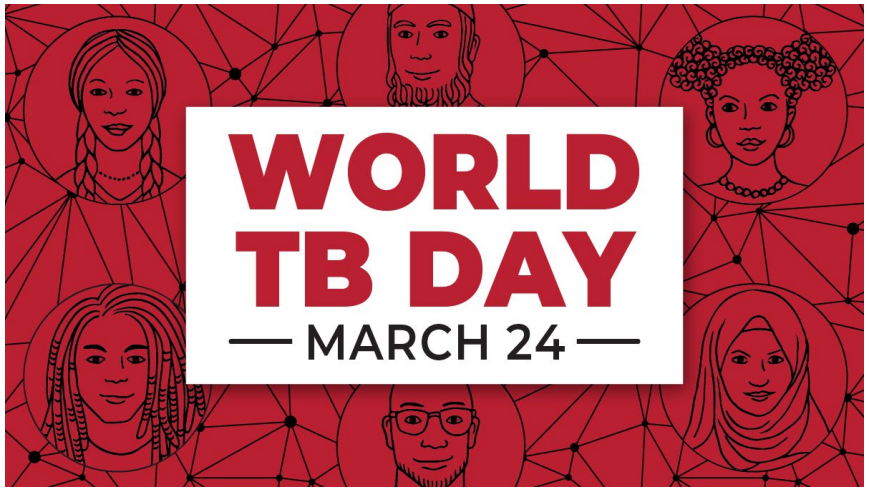
Higher rates of NTM are found in the south and southeastern United States than in other regions

HTTPS://WWW.VDH.VIRGINIA.GOV/TUBERCULOSIS/

Email: tuberculosis@vdh.virginia.gov
Call: 804-864-7906

"What are You? Show me your ID!"

The overlap of tuberculosis (TB), non-tuberculous mycobacteria (NTM), and COVID-19



Scott Heysell MD, MPH
Associate Professor of Medicine
Infectious Diseases and International Health

Eric Houpt MD
Professor of Medicine
Chief, Infectious Diseases and International Health

University of Virginia

We are grateful for our public health services!

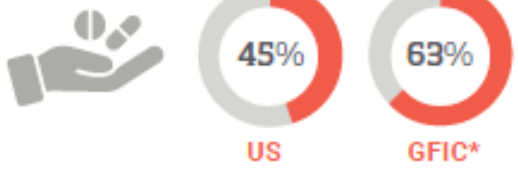
Community COVID-19 testing event, Mt. Zion African Baptist Church, Charlottesville
UVAToday

GLOBALLY

70%+ HEALTHCARE WORKERS

reported a decrease in the number of people coming to health facilities for TB testing.

Healthcare workers also reported reductions in the number of people with TB coming to healthcare facilities for treatment:



IN KENYA

50% OF PEOPLE WITH TB

reported having trouble finding transport to care facilities

IN INDIA

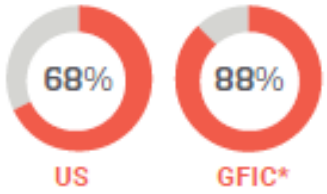
36% OF PEOPLE WITH TB

reported health facilities they normally visit closed

*GFIC= Global Fund implementing countries

GLOBALLY

policy and program officers reported significant drops in TB notification



70% of officers from Global Fund implementing countries reported a DECREASE in the number of people with TB receiving treatment

75% OF ADVOCATES FROM GLOBAL FUND ELIGIBLE COUNTRIES

reported a decrease in TB testing during the pandemic

73%

reported people with TB to be facing significant challenges accessing treatment and care

Civil Society TB Report on TB and COVID-19. Stop TB Partnership.

20% increase in TB deaths worldwide in 5 years after the pandemic compared to pre-pandemic

Hogan et al. *Lancet Global Health* 2020

University of Virginia Health changes in TB care during the pandemic

	2019	2020
LTBI tests	**837**	**350**
LTBI positive tests	**84**	**42**
Active TB inpatients	**3**	**11**
Active TB outpatients	**6**	**10**
TB deaths	**1**	**0**

Far less LTBI care, but doubling of people with active TB seen in inpatient and outpatient settings

Courtesy of Dr. Tania Thomas

Virginia participating in multi-country study with World Health Organization to understand COVID in people with current and prior TB

33 centers in 16 countries on 5 continents→
attendance for TB care was lower during the first 4 months of the pandemic in 2020 than for the same period in 2019

Preliminary analysis suggests→

T**B and COVID-19 were frequently diagnosed simultaneously**, complicating and often delaying diagnosis in some participants.

SARS CoV-2 infection may **amplify the progression to active TB** disease.

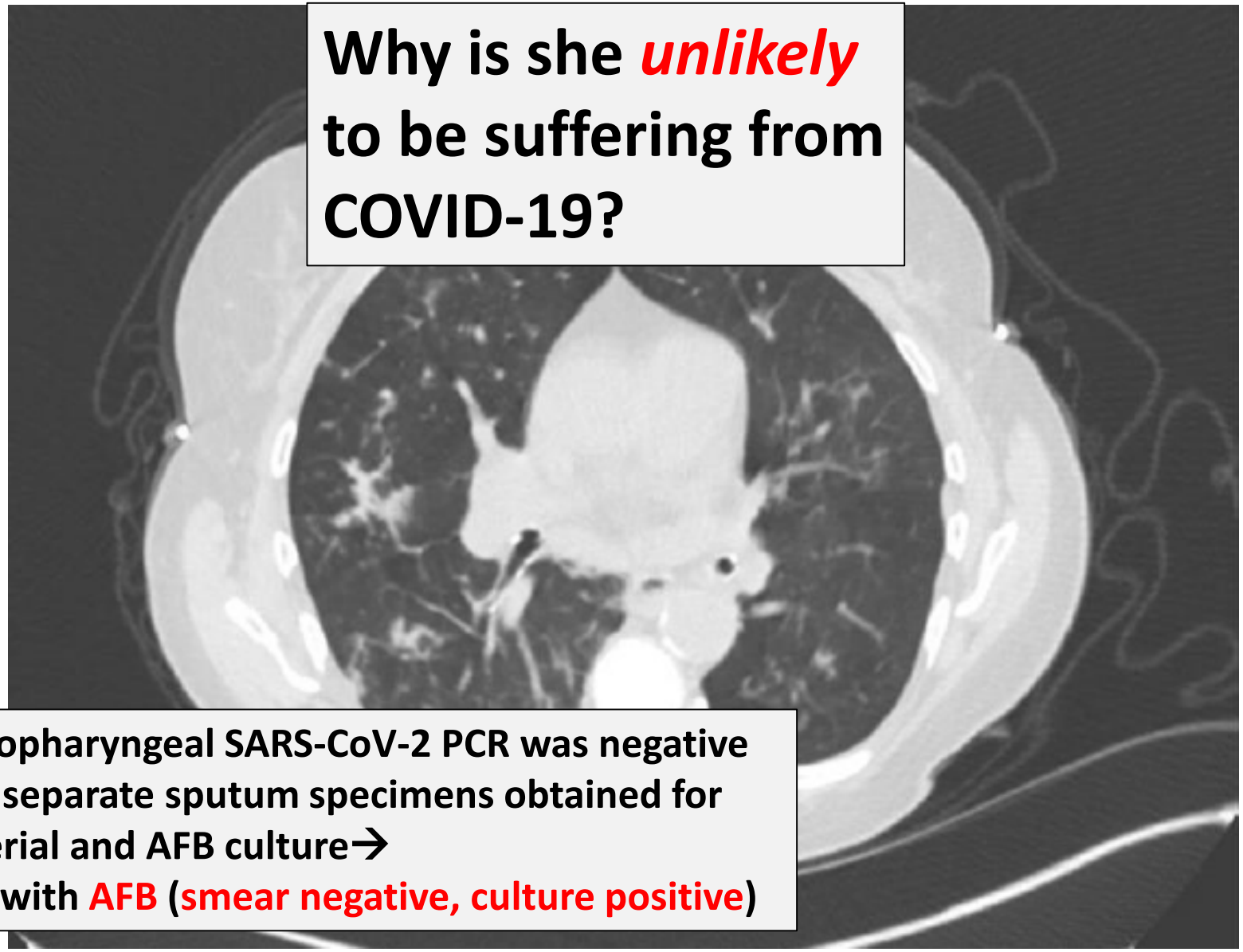
SARS CoV-2 can develop in patients treated/cured of TB often in setting of **chronic lung disease**.

People co-infected with TB and SARS CoV-2 had a **high impact on the health system**.

COVID-19 has disrupted TB services globally.

Tadolini et al, *Euro Resp J* 2021
Migliori et al, *Emerg Infect Dis* 2020

A more common scenario in Virginia…



Why is she *unlikely* to be suffering from COVID-19?

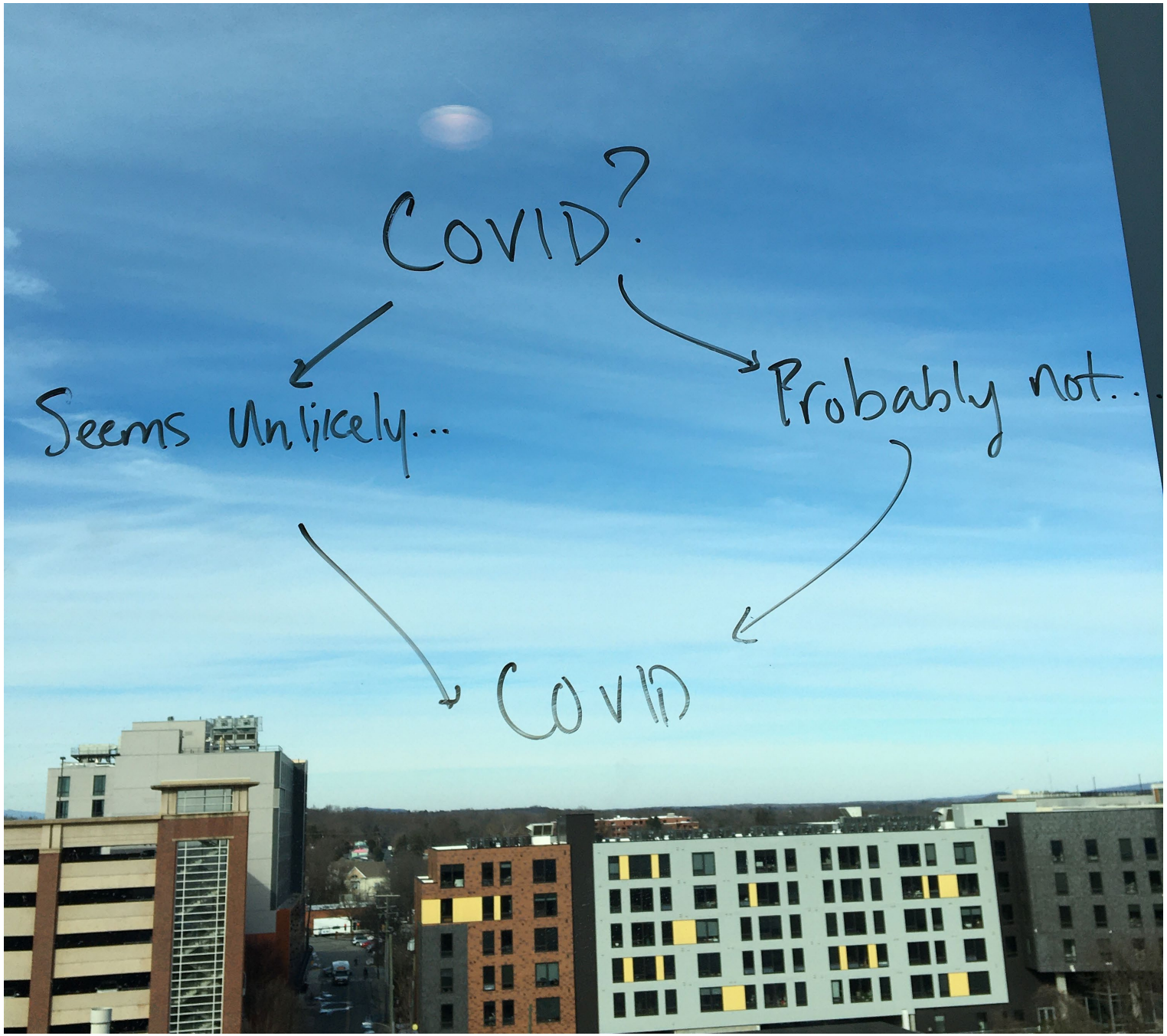
68 year old woman

-Chronic non-productive cough
-Shortness of breath
-Mild malaise

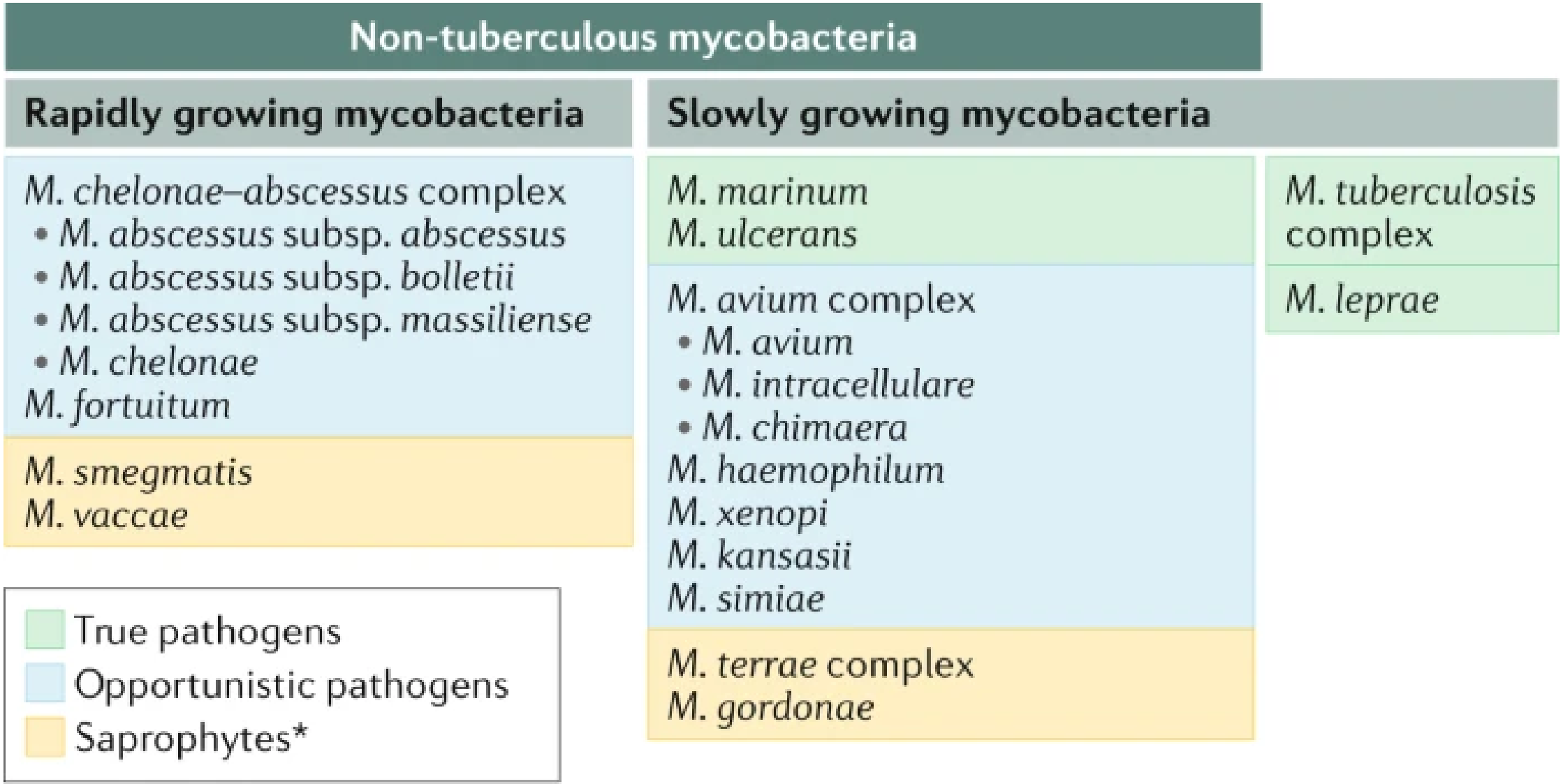
-Possible h/o allergic bronchopulmonary aspergillosis
-No other known immunocompromising conditions

-CT with peribronchovascular infiltrates, nodules (no bronchiectasis)

- Nasopharyngeal SARS-CoV-2 PCR was negative
-Two separate sputum specimens obtained for bacterial and AFB culture→
Both with AFB (smear negative, culture positive)

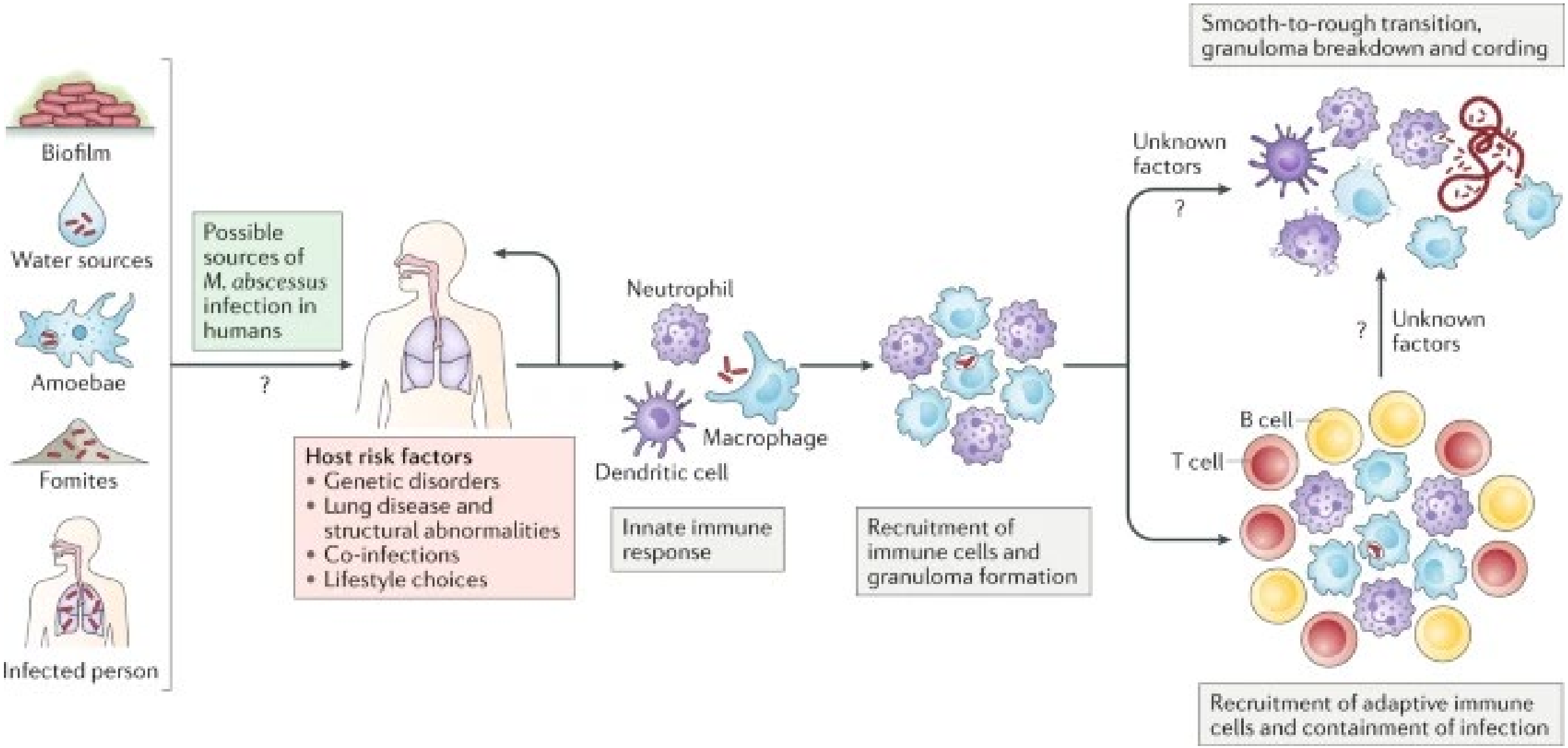


UVA Health Special Pathogens Unit 2021



Johansen et al, *Nature Rev Micro* 2020

Example: *Mycobacterium abscessus* pathogenicity



Johansen et al, *Nature Rev Micro* 2020

NO FEES OF ANY KIND.

ST. JAMES'S THEATRE,

Lady Windermere's Fan

MIDSUMMER DAY

NO FEES. NO FEES.

1892- Oscar Wilde

“**I resist anything but temptation**.”

Lord Darlington- Act 1

“**Experience is the name everyone gives to their mistakes.”**

Mr. Dumbly- Act 3

Not all positive NTM sputum cultures require treatment

Clinical
1. Pulmonary symptoms, nodular or cavitary opacities on chest radiograph, or ahigh-resolution computed tomographic scan that shows multifocal bronchiectasis with multiple small nodules
and
2. Appropriate exclusion of other diagnoses.
Microbiologic
1. Positive culture results from at least two separate expectorated sputum samples (If the results from the initial sputum samples are nondiagnostic, consider repeat sputum acid-fast bacillus (AFB) smears and cultures)
or
2. Positive culture results from at least one bronchial wash or lavage
or
3. Transbronchial or other lung biopsy with mycobacterial histopathological features (granulomatous inflammation or AFB) and positive culture for NTM or biopsy showing mycobacterial histopathological features (granulomatous inflammation or AFB) and one or more sputum or bronchial washings that are culture positive for NTM
4. Expert consultation should be obtained when NTM are recovered that are either infrequently encountered or that usually represent environmental contamination
5. Patients who are suspected of having NTM lung disease but who do not meet the diagnostic criteria should be followed until the diagnosis is firmly established or excluded
6. Making the diagnosis of NTM lung disease does not, per se, necessitate the institution of therapy, which is a decision based on potential risks and benefits of therapy for individual patients

Symptoms + imaging

Exclude other diagnoses

2 or more separated sputum samples (or one bronchoscopy specimen)

ATS/IDSA Guidelines 2007 (repeated in 2020 treatment guidelines)

TB or Not TB?… that is the question

***M. tuberculosis* complex**

M. tuberculosis

M. bovis (almost all pyrazinamide resistant)

M. africanum (more W. Africa)

M. microti

M. canetti

Non-tuberculous mycobacteria
>140 species
~25 known to cause human disease

Almost always disease
M. kansasii

Intermediate
M. avium complex (MAC)

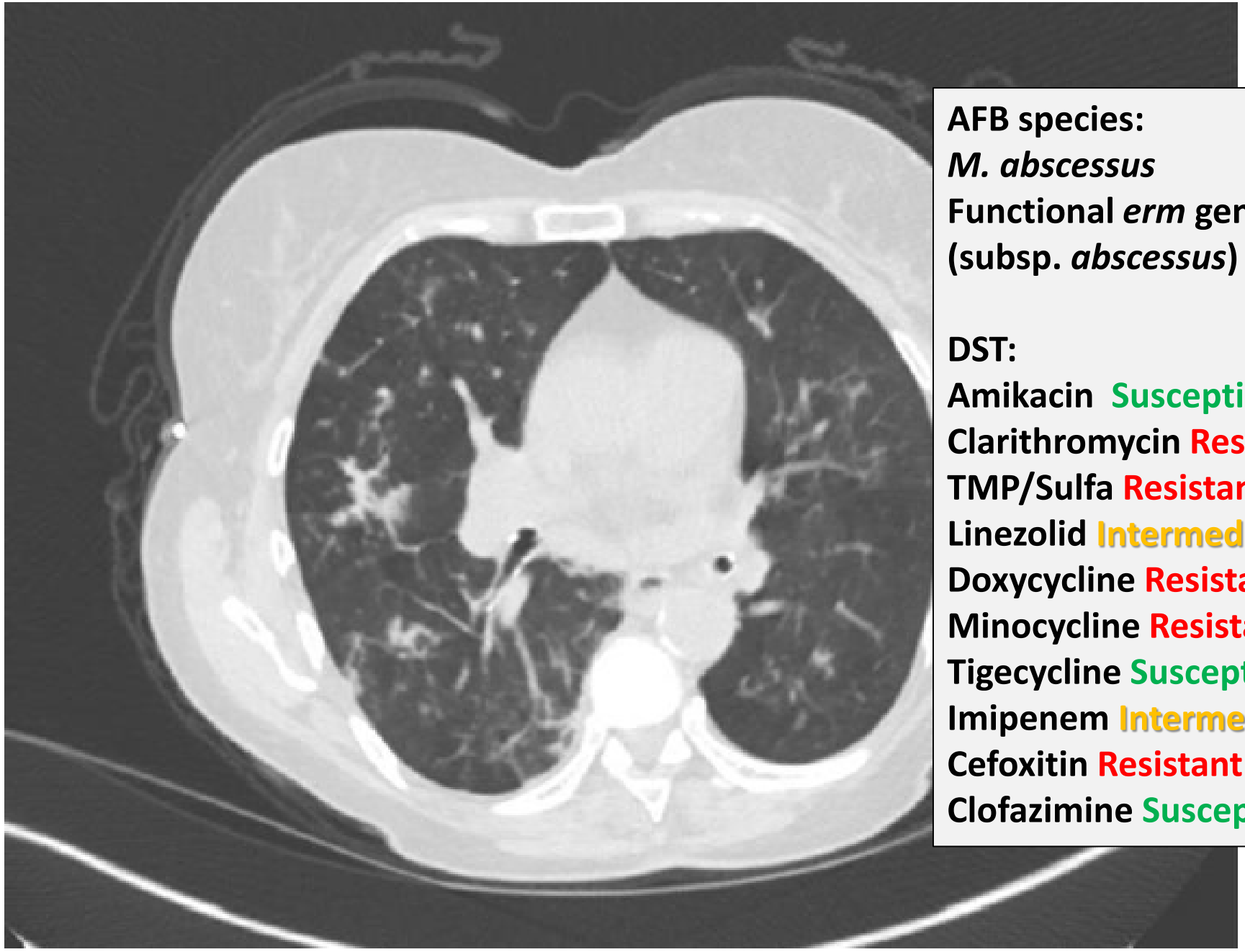
M. abscessus group

Possible contaminant
M. chelonae
M. simiae

Likely contaminant
M. gordonae

For example: MAC and *M abscessus* group account for >90% of all NTM in cystic fibrosis

Recall our 68 year-old woman….

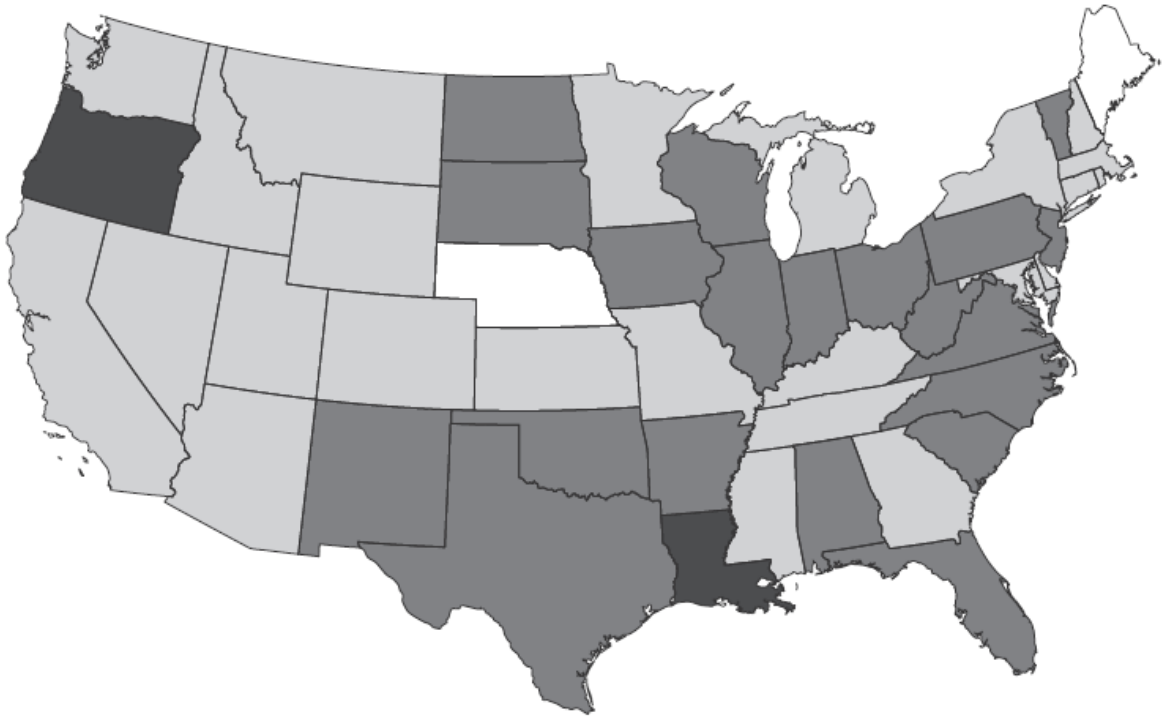


AFB species:
M. abscessus
Functional *erm* gene
(subsp. *abscessus*)

DST:
Amikacin Susceptible
Clarithromycin Resistant
TMP/Sulfa Resistant
Linezolid Intermediate
Doxycycline Resistant
Minocycline Resistant
Tigecycline Susceptible
Imipenem Intermediate
Cefoxitin Resistant
Clofazimine Susceptible

Cystic Fibrosis, screening rates and positive cultures (tip of the iceberg)

M. abscessus



Percentage of Positive Cultures with *M. abscessus*

- >80 – 100
- >60 – 80
- >40 – 60
- >20 – 40
- 0 – 20

Most predictive factor for NTM positivity among patients with cystic fibrosis, was the saturated vapor pressure of their zip code

Adjimean, *AJRCCM* 2014

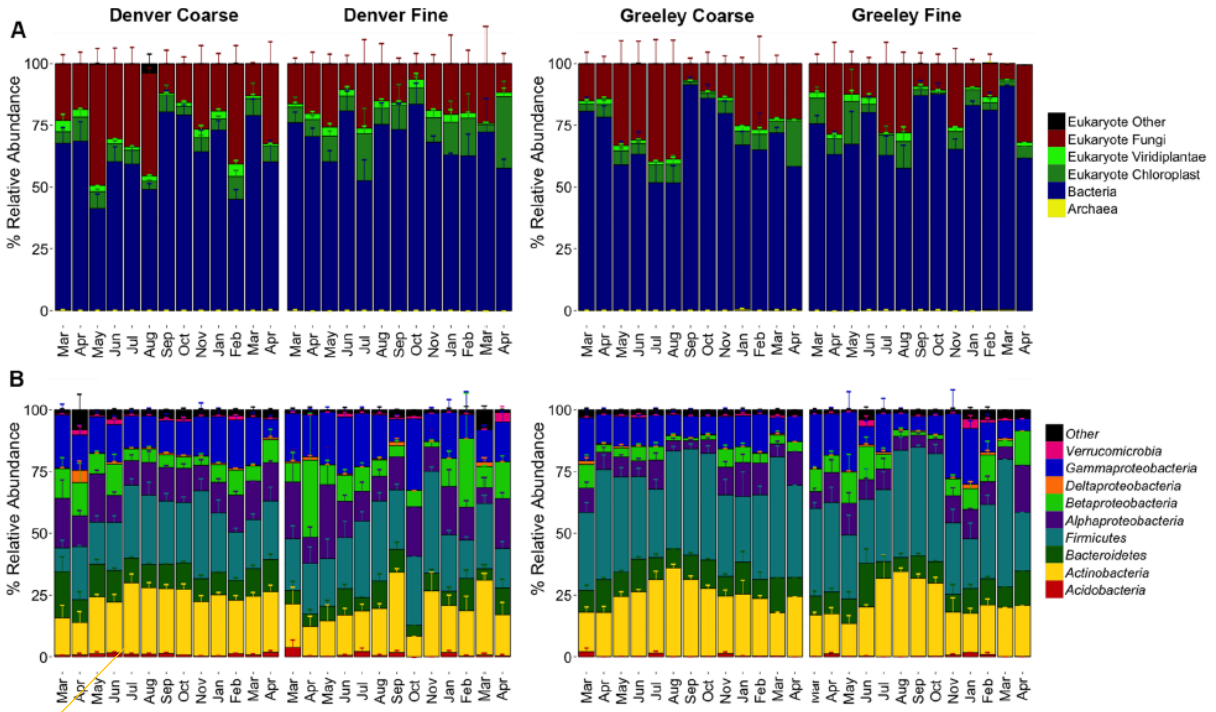
Prevalence of pulmonary disease caused by non-tuberculous mycobacteria (NTM) is increasing worldwide

Environmental factors

Increased surveillance / more sensitive diagnostics

More immunosuppressed patients, living longer

Outbreaks of clonal strains with increased transmissibility or favorable environment



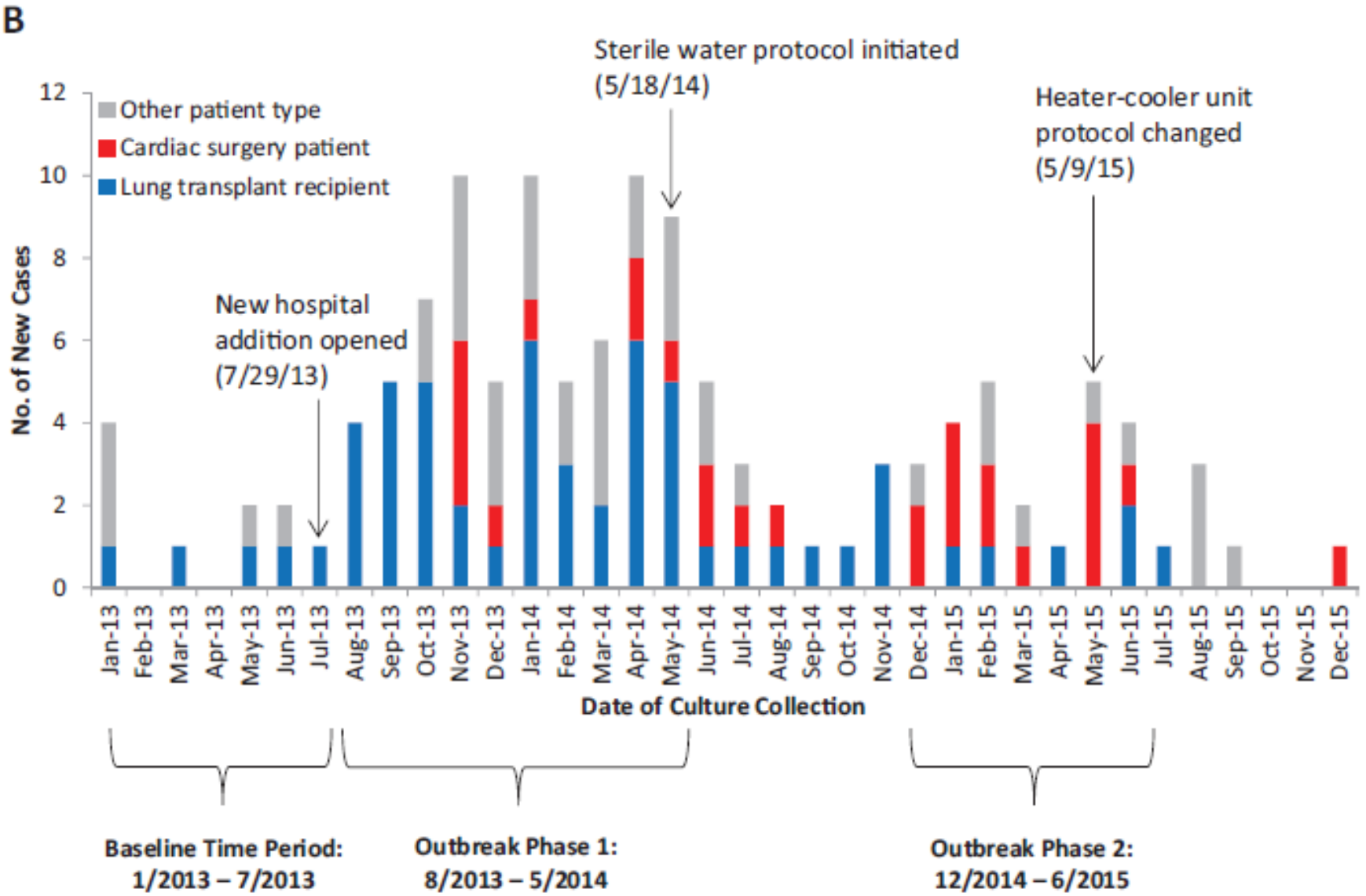
1000-1,000,000 cells/ cubic meter near surface air

2 sites in Colorado ~25% of bioaerosol bacteria are Actinobacteria (mycobacteria)

Adjimean et al, *AJRCCM* 2012

Bowers, *Env Science Tech* 2013

Large nosocomial outbreak of *Mycobacterium abscessus* at Duke (2 clonal strains)



Baker et al, *Clin Infect Dis* 2017

NTM treatment principles

Unlike TB, culture conversion to negative is not always possible

Occasional disease recurrence (depends on the host, the specific NTM species, and the multidrug treatment with the first episode)

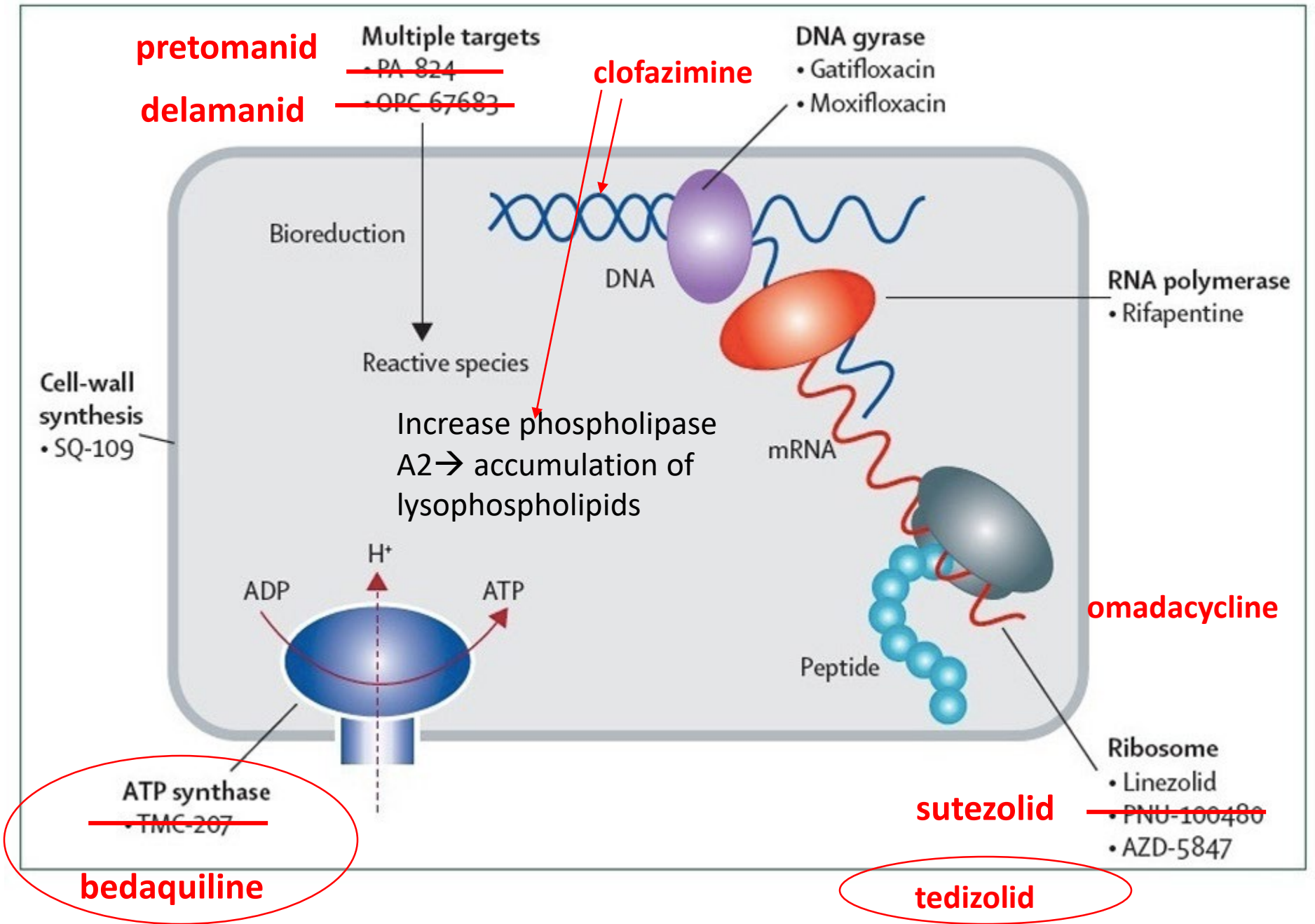
Some NTM treatment without antibiotics (surgery common for extrapulmonary disease)

Unlike TB, the minimum duration is 12 months (usually 12 months beyond culture conversion for pulmonary disease)

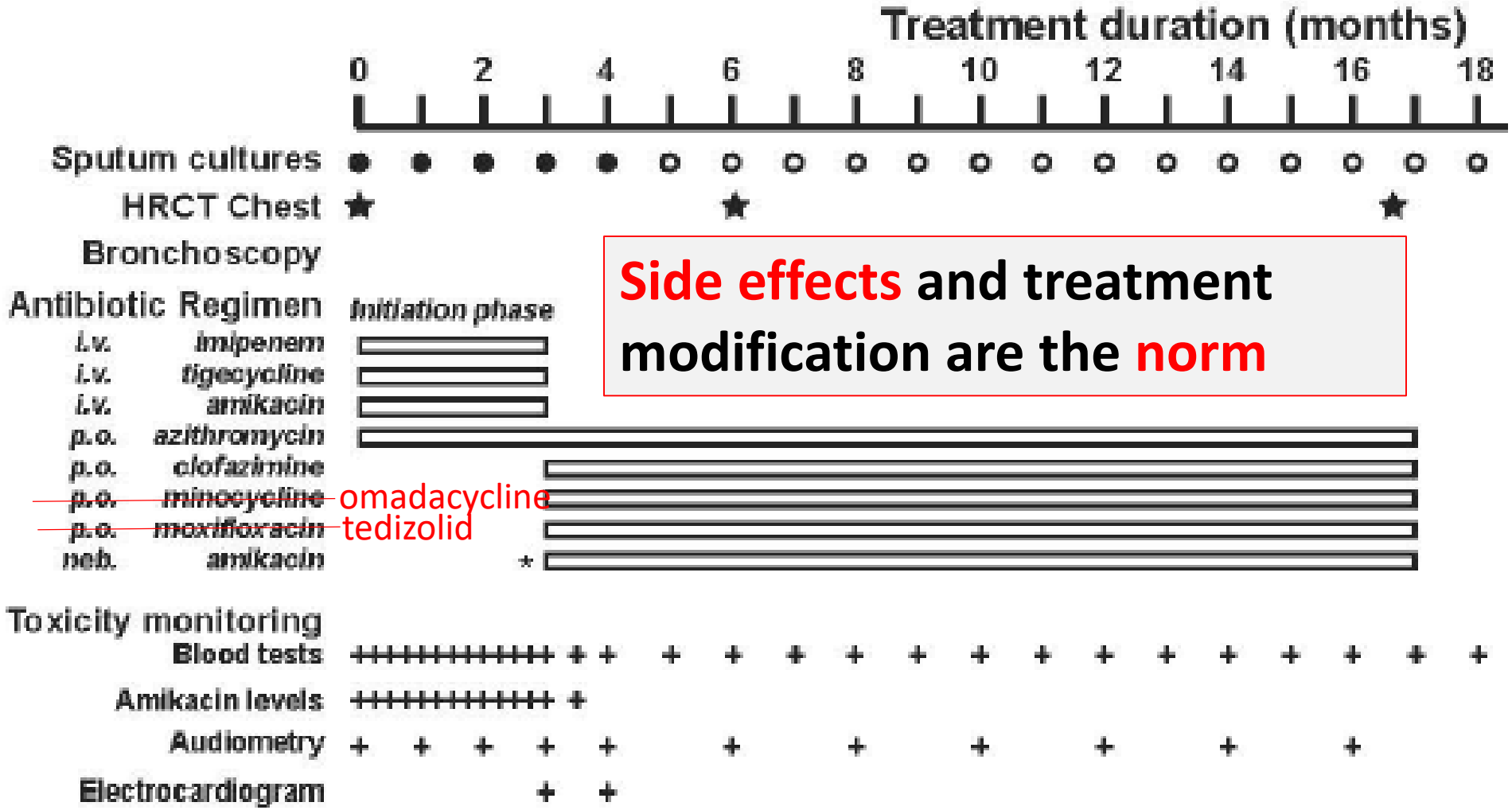
Treatment ranges from three drugs for *Mycobacterium avium* complex (MAC) to five drugs with IV induction phase for drug-resistant NTM like *Mycobacterium abscessus*

NTM Facts.com

New or repurposed mycobacterial drugs



This is what a complete treatment regimen looks like over time for a complicated NTM (*M. abscessus*)→ a lot like MDR or XDR-TB!



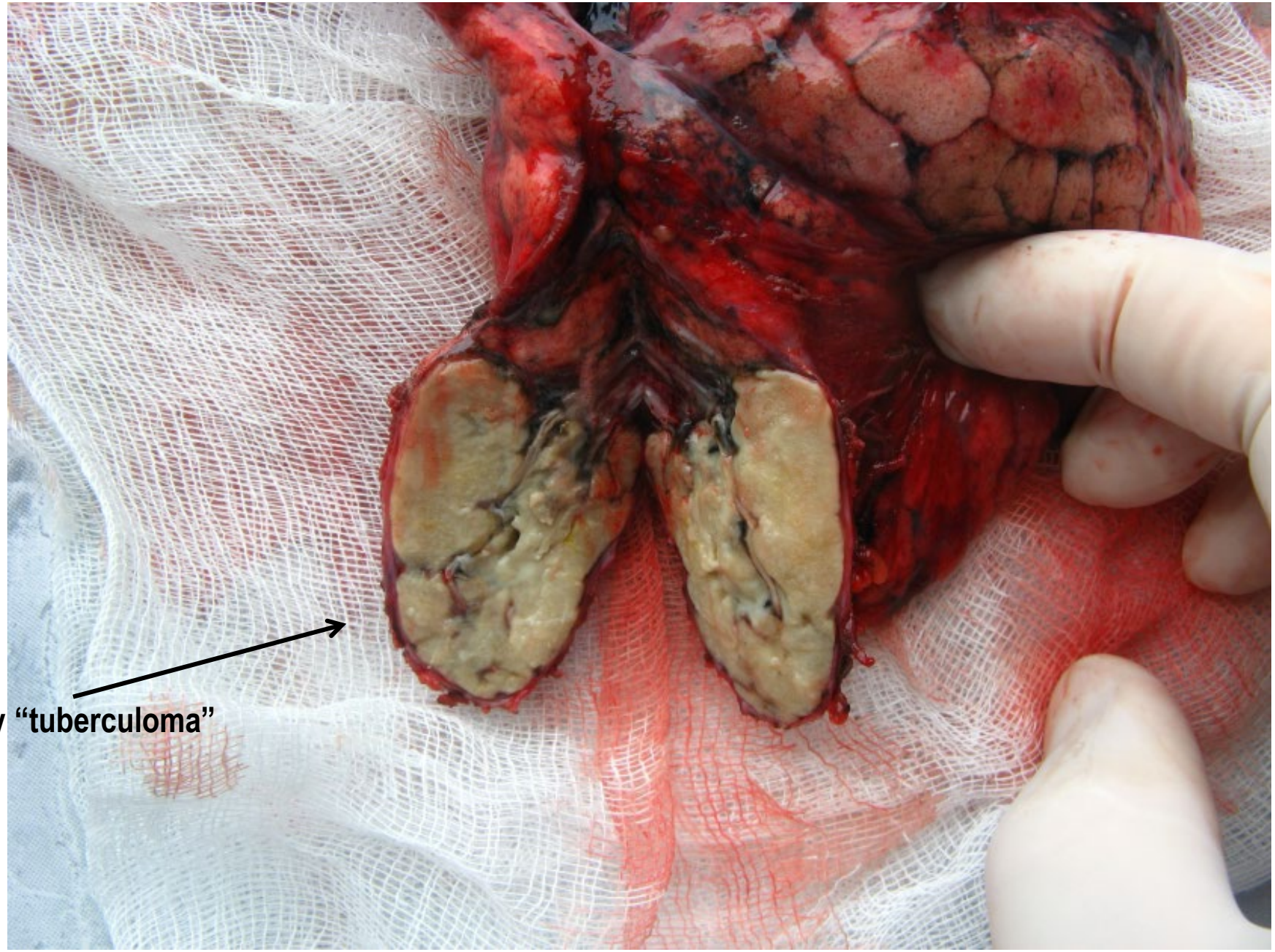
Side effects and treatment modification are the norm

ATS/IDSA 2020; US CFF and ECFS guidelines, 2015

Photos with permission.

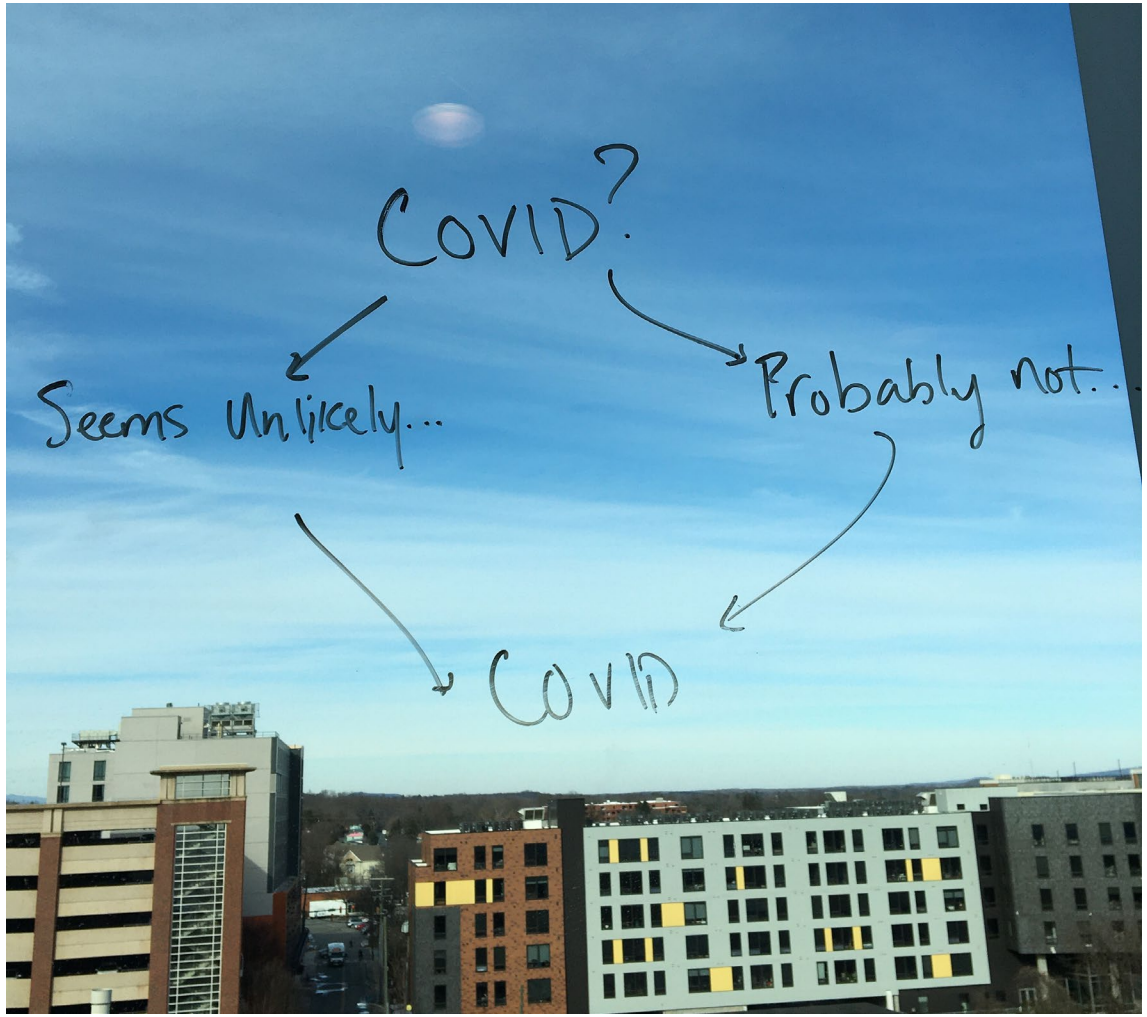
Irkutsk, Siberia: modern day surgery pursued for difficult mycobacterial cases

Thoracoplasty with rib resection



Resected pulmonary “tuberculoma”

So we will never forget about COVID-19….



Non-tuberculous mycobacteria (**NTM**) can **mimic tuberculosis** and are **increasing worldwide**

Diagnostic testing in the pandemic should **consider mycobacterial disease** (NTM and TB), particularly with chronic cough and/or extrapulmonary symptoms

Unlike TB, **not all NTM require treatment** and unlike rifampin-susceptible TB, **when NTM require treatment it is often long** (12 months or more) and may necessitate surgery

MAC
M. avium complex

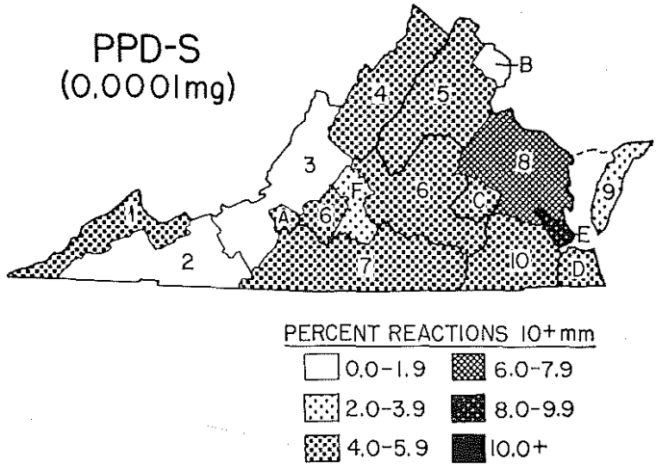
Eric Houpt

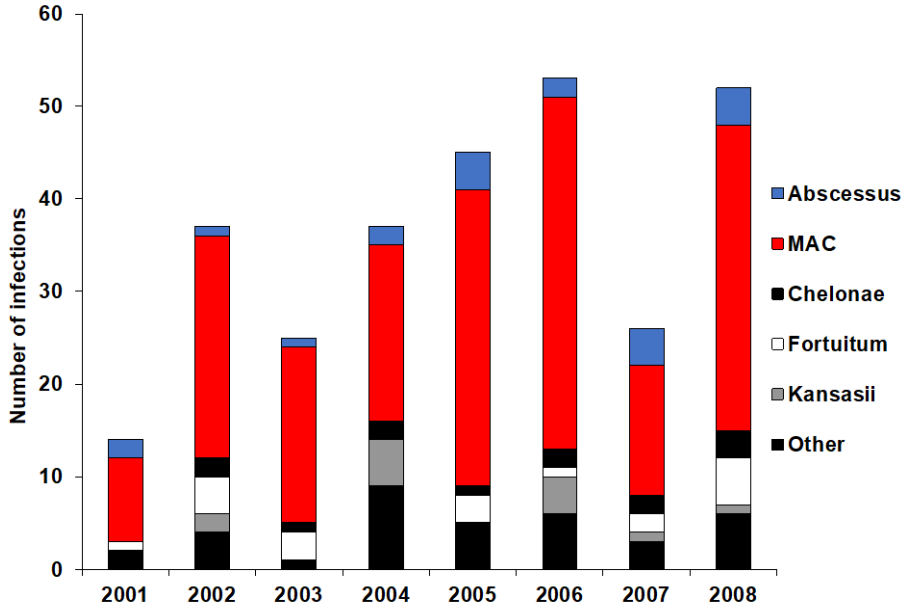
Professor and Chief

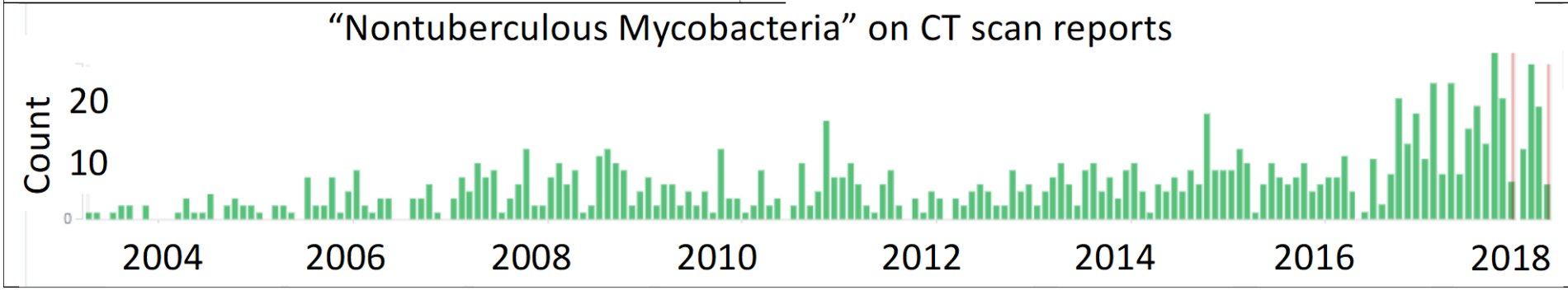
Infectious Diseases, UVA

NTM infections increasing in US

Fig. 1. NTM infections increasing over time in Virginia. Left, Virginia had overall 36% skin test reactivity to *M. intracellulare* among 3280 young male Navy recruits in 1958 (1). Right, mycobacterial infections over time at UVA Hospital (*M. gordonae* excluded) led by MAC (red). Bottom, A search of CT scan radiology reports reveals a higher appreciation for "NTM" on the differential diagnosis.

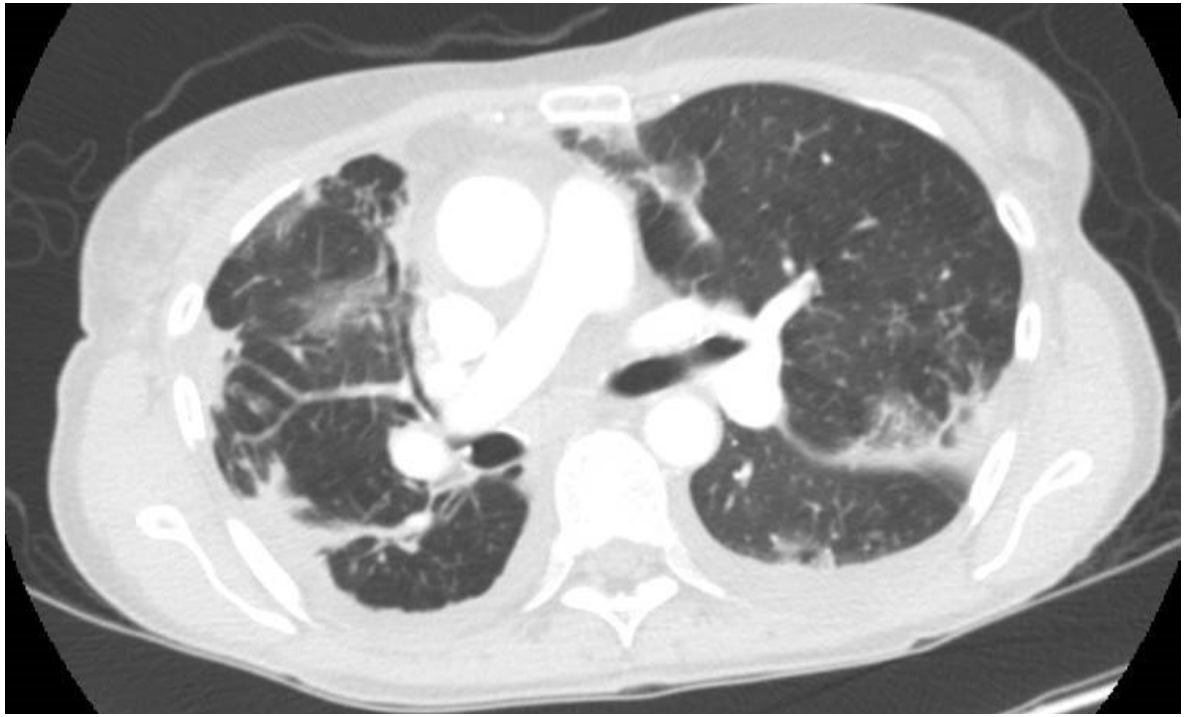






Example 1

- 71 y.o. female with progressive nodular bronchiectasis
- On therapy for years, including standard triple therapy: Azithromycin, Rifampin, Ethambutol



Example 2

MDR TB patient, cavity in RUL measuring 9.6 cm

Date	Site	SMEAR	Culture
12/16/19	Sputum	Many AFBs	
12/16/19	Sputum	Rare AFBs	
12/20/19	Sputum	4+	
12/23/19	Sputum	4+	3+ M.tb
12/30/19	Sputum	3+	2+ M.tb
1/6/2020	Sputum	2+	M. avium
1/13/2020	Sputum	1+	1+ M.tb
1/21/2020	Sputum	1+	11-25 colonies M.tb
1/27/2020	Sputum	Negative	M.Tb
2/3/2020	Sputum	1+	Negative
2/7/2020	Sputum	1+	Negative
2/12/2020	Sputum	1+	Negative
2/18/2020	Sputum	1+	Negative
2/21/2020	Sputum	Negative	Negative
2/28/2020	Sputum	1+	MAC
3/4/2020	Sputum	1+	MAC
3/9/20	Sputum	1+	negative
3/18/2020	Sputum	Negative	Negative
3/20/2020	Sputum	Negative	Negative
3/23/20	Sputum	Negative	MAC

Clinically doing well. Assessment: probably MAC colonization of cavity, probably no MAC treatment, refer nonurgently post MDR TB-rx to Pulmonary or Infectious Disease MD

Recommendation

- If multiple sputum/respiratory specimens culture positive for the same Mycobacterium, refer non-urgently to ID/Pulmonary MD

Date	Client 1	Client 2	Client 3	Client 4	Client 5
AFB culture 1	negative	negative	M. gordonae	MAC	M. abscessus
AFB culture 2	negative	negative	negative	negative	M. abscessus
AFB culture 3	negative	MAC	MAC	MAC	M. abscessus
	Nothing to do	Nothing to do	Nothing to do	Refer	Refer

- Can always call or refer to Houpt/Heysell UVA (434 982 1700) or someone more local
- NTMinfo: https://ntminfo.org/united-states-of-america/

New VDH-UVA-VT NTM Project

- January 2021 – December 2025
- Focusing on the two most common NTM:
- M. avium complex
- M. abscessus

Project

- 1. Sequencing of MAC and abscessus from patients and environmental sources
- 2: Among newly treated NTM lung disease patients, perform serum drug levels to see if low drug levels predict poorer clinical outcome

Workflow

VDH identifies possible NTM lung disease cases =multiple respiratory cultures positive for the same NTM

→

- VDH/UVA connect with the ordering physician office to enroll participant if interested
- OR, refer to UVA

→

- Enrollment
- Quarterly follow-up x 5 years
- Environmental testing
- If starting therapy, serum drug levels

Team

- UVA
- Eric Houpt, Scott Heysell, Suzanne Stroup, Amy Mathers, Hardik Parikh, Suporn Pholwat, Girija Ramakrishnan, Michael Hanley
- Main contact: Lisa Johnson: SFJ8N@hscmail.mcc.virginia.edu

- VDH
- Jasie Hearn, Laura Young

- Virginia Tech
- Joe Falkinham