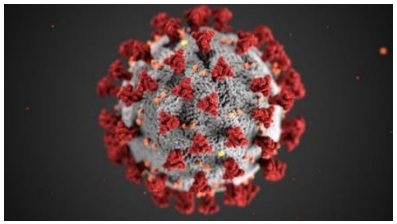
The state of TB: Essential updates

END TB NYC

Joseph Burzynski, MD, MPH
Director, Bureau of Tuberculosis Control
NYC Department of Health and Mental Hygiene

COVID-19 AND TB SERVICES IN NYC

- We are **still providing essential TB services**
- Current impact:
  - 3 out of 4 of our chest centers are closed until further notice as of Monday, March 23 – Fort Greene Chest Center is open
  - Limiting in-clinic appointments to patients who have
    - active TB disease, as well as their contacts
    - recently been discharged from the hospital
  - Switching to **telemedicine** and **vDOT** when possible



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COVID-19 AND TB SERVICES IN NYC

What you need to know:

- Consider your patients' needs during this time of isolation and disconnection
- As you are seeing patients who may have COVID-19, you should also **"think TB"**
- Everyone should be staying at home right now, but if your TB patients are having additional symptoms or adverse medication side effects, they should **call their case manager or health care provider**
- The TB Provider Hotline is still available at (844) 713-0559 – **we are here to support you**

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ESSENTIAL UPDATES

1. 2019 U.S., NYS, & NYC TB Summary
2. Latent TB infection (LTBI) updates
3. New guidelines and policies for TB testing
4. Multidrug-resistant (MDR) TB updates
5. BTBC updates
6. Hopeful developments in TB care

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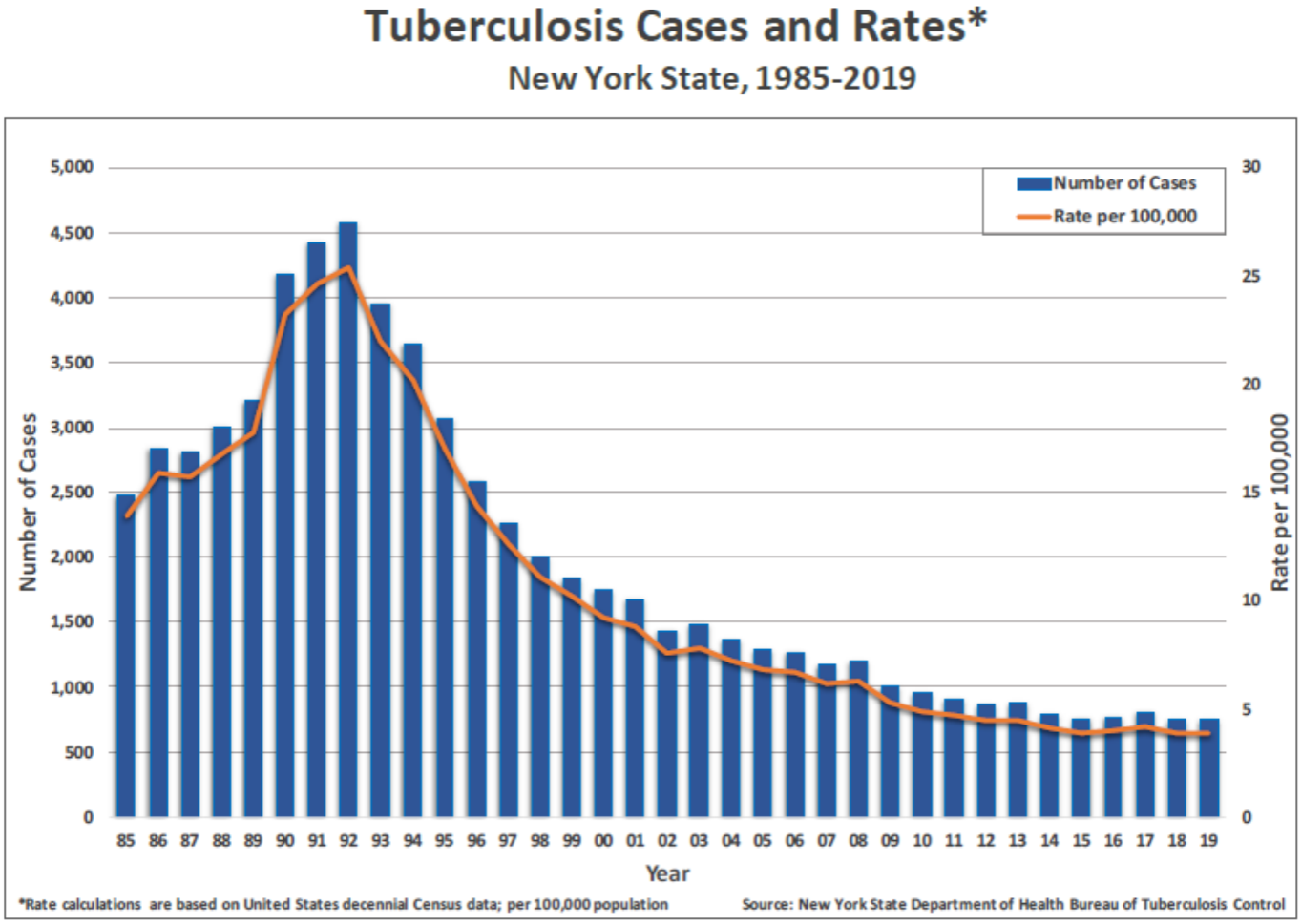
2019 U.S. and NEW YORK STATE TB SUMMARY

UNITED STATES TB DATA, 2019

- Total new cases reported: **8,920**
- Lowest case count in the U.S. on record
- 1.1% lower than 2018
- TB case rate of **2.7 per 100,000**

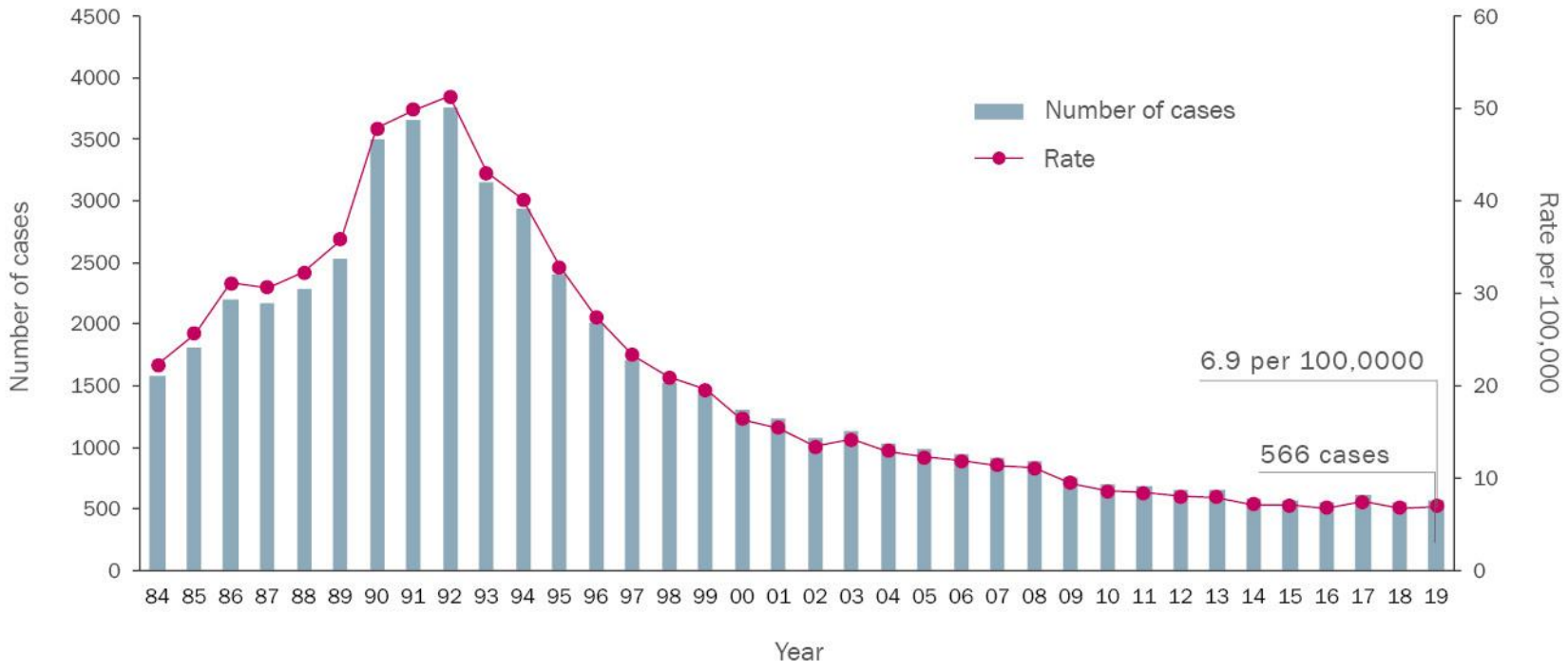
NEW YORK STATE (NYS) TB DATA, 2019



Total NYS cases: 754; case rate is 3.9 per 100,000

2019 NYC TB SUMMARY

TUBERCULOSIS CASES AND RATES,[1] NEW YORK CITY, 1984-2019



1984-1992:

Overall increase: **139%**
Average annual increase: **12%**

1992-2010:

Overall decrease: **81%**
Average annual decrease: **8%**

2010-2019:

Overall decrease: **20%**
Average annual decrease: **2%**

1. Rates are based on decennial census data

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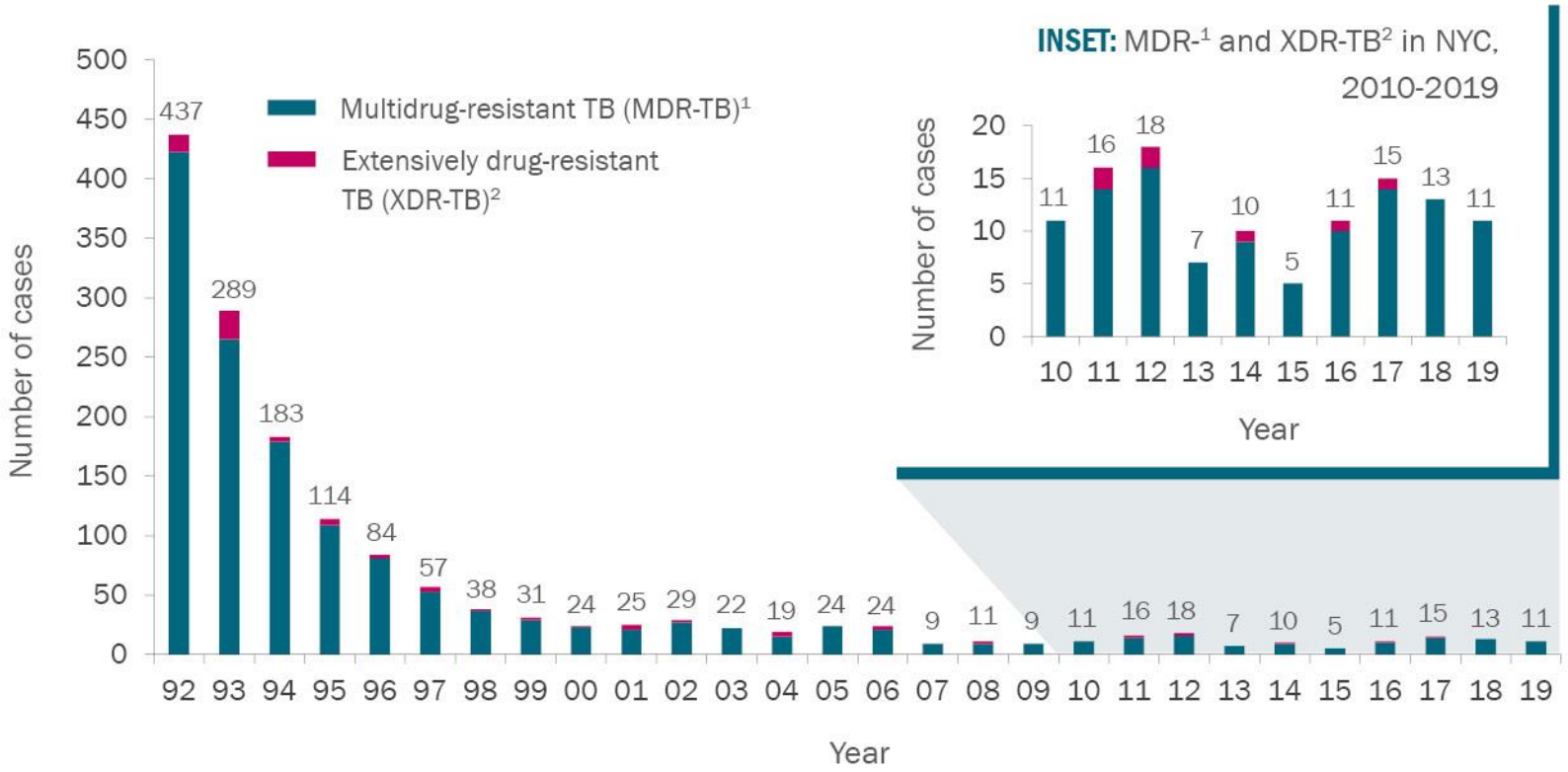
MULTIDRUG-RESISTANT TUBERCULOSIS, NEW YORK CITY, 1992-2019



1. MDR-TB is defined as resistance to at least isoniazid and rifampin. 2. XDR-TB is defined as resistance to at least isoniazid and rifampin plus a fluoroquinolone and a second-line injectable anti-TB medication.

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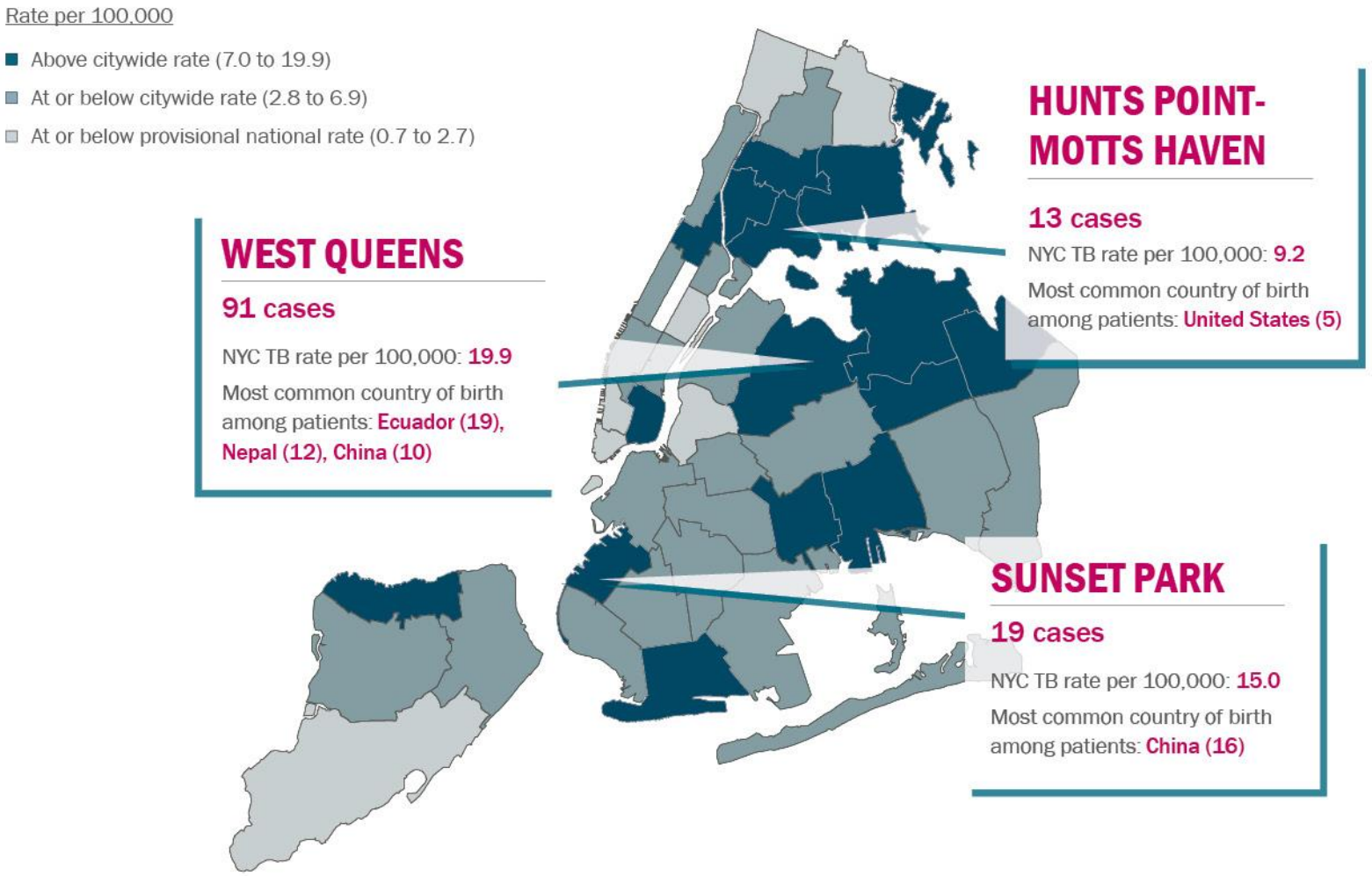
TUBERCULOSIS RATES BY UNITED HOSPITAL FUND NEIGHBORHOOD, NEW YORK CITY, 2019



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LTBI UPDATES

CDC MMWR: NEW LTBI TREATMENT GUIDELINES

Centers for Disease Control and Prevention
MMWR
Morbidity and Mortality Weekly Report
Recommendations and Reports / Vol. 69 / No. 1
February 14, 2020

Guidelines for the Treatment of Latent Tuberculosis Infection: Recommendations from the National Tuberculosis Controllers Association and CDC, 2020

Timothy R. Sterling, MD[1]; Gibril Njie, MPH[2]; Dominik Zenner, MD[3]; David L. Cohn, MD[4]; Randall Reves, MD[4]; Amina Ahmed, MD[5]; Dick Menzies, MD[6]; C. Robert Horsburgh, Jr., MD[7]; Charles M. Crane, MD[8]; Marcos Burgos, MD[8,9]; Philip LoBue, MD[2]; Carla A. Winston, PhD[2]; Robert Belknap, MD[4,8]

[1]Vanderbilt University Medical Center, Nashville, Tennessee; [2]National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Division of Tuberculosis Elimination, CDC, Atlanta, Georgia; [3]Institute for Global Health, University College London, London, England; [4]Denver Health and Hospital Authority, Denver, Colorado; [5]Levine Children's Hospital, Charlotte, North Carolina; [6]Montreal Chest Institute and McGill International TB Centre, Montreal, Canada; [7]Boston University Schools of Public Health and Medicine, Boston, Massachusetts; [8]National Tuberculosis Controllers Association, Smyrna, Georgia; [9]University of New Mexico Health Science Center and New Mexico Department of Health, Albuquerque, New Mexico

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CDC MMWR: NEW LTBI TREATMENT GUIDELINES

- Short-course (3 to 4 month) rifamycin-based regimens are preferred over longer course (6-9 month) isoniazid therapy for LTBI treatment
  - Once weekly isoniazid (INH) + rifapentine for 12 weeks (3HP)
  - Daily rifampin (RIF) for 4 months (4R)
- Guidelines give another option of 3 months daily INH + RIF; however, this regimen is not routinely used in NYC

TABLE 3. Recommendations for regimens to treat latent tuberculosis infection

Priority rank*	Regimen	Recommendation (strong or conditional)	Evidence (high, moderate, low, or very low)
Preferred	3 mos isoniazid plus rifapentine given once weekly	Strong	Moderate
Preferred	4 mos rifampin given daily	Strong	Moderate (HIV negative)†
Preferred	3 mos isoniazid plus rifampin given daily	Conditional	Very low (HIV negative)
		Conditional	Low (HIV positive)
Alternative	6 mos isoniazid given daily	Strong§	Moderate (HIV negative)
		Conditional	Moderate (HIV positive)
Alternative	9 mos isoniazid given daily	Conditional	Moderate

Abbreviation: HIV = human immunodeficiency virus.

* *Preferred:* excellent tolerability and efficacy, shorter treatment duration, higher completion rates than longer regimens and therefore higher effectiveness; *alternative:* excellent efficacy but concerns regarding longer treatment duration, lower completion rates, and therefore lower effectiveness.

† No evidence reported in HIV-positive persons.

§ Strong recommendation for those persons unable to take a preferred regimen (e.g., due to drug intolerability or drug-drug interactions).

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SHORTER REGIMENS FOR LTBI TREATMENT

BTBC has found **higher rates of treatment completion** among patients placed on shorter regimens for LTBI treatment (4R and 3HP)

INT J TUBERC LUNG DIS 22(11):1344–1349

http://dx.doi.org/10.5588/ijtld.18.0035

Improved treatment completion with shorter treatment regimens for latent tuberculous infection

M. M. Macaraig,* M. Jalees,*† C. Lam,*† J. Burzynski*

*New York City Department of Health and Mental Hygiene, New York, New York, †Centers for Disease Control and Prevention, Atlanta, Georgia, USA

CONCLUSIONS: Most patients were placed on shorter regimens for LTBI treatment, and higher treatment completion was observed. Encouraging community providers to use shorter regimens for LTBI treatment would reduce the TB disease burden in NYC.

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GUIDELINES AND POLICIES FOR TB TESTING

NEW CDC GUIDELINES: HEALTH CARE WORKER (HCW) TESTING

- Update recommendations for **TB testing for U.S. HCW**
  - Preplacement: Symptom assessment and IGRA or TST with individual TB risk assessment **(new)**
  - Post-exposure: Symptom assessment and IGRA or TST for those with a negative test at baseline and no TB history **(unchanged)**
  - Serial screening and testing **(new)**
    - Screening / testing not routinely recommended; can be considered for certain HCW groups
    - Annual TB education of all HCW including TB exposure risks
  - Follow up of HCW with LTBI– treatment strongly recommended unless contraindication exists **(new)**
- New York State recently proposed regulations that will be adopted soon

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NEW YORK CITY HEALTH CODE CHANGE

New York City Health Code change **requires laboratory reporting** of all blood-based test results for TB infection

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NEW YORK CITY DEPARTMENT OF HEALTH AND MENTAL HYGIENE
BOARD OF HEALTH

Notice of Adoption of Amendments to Articles 11 and 13 of the New York City Health Code

In accordance with Section 1043 of the New York City Charter (the "Charter") and pursuant to the authority granted to the Board of Health (the "Board") by Section 558 of the Charter, a notice of intention to amend Articles 11 and 13 of the New York City Health Code (the "Health Code") was published in the City Record on June 19, 2019, and a public hearing was held on July 22, 2019. No individuals testified at the public hearing; three written comments were received. After consideration of those comments one change was made for clarity. At its meeting on October 8, 2019, the Board adopted the following resolution.

Tuberculosis Infection Reporting

The Board is amending Health Code Sections 11.03(a) and 13.03(b)(1) to require laboratories to report all test results for tuberculosis (TB) infection, including negative results. Prior to the adoption of these amendments, the Health Code required reporting only of test results and other information attendant to active TB disease, and tests positive for TB infection and related information for children under five years old.

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REMINDER: TB REPORTING REQUIREMENTS

- Report all patients with suspected or confirmed TB disease to the NYC Health Department within 24 hours of diagnosis or clinical suspicion
- Report all results of blood-based tests for TB infection within 24 hours of obtaining test results
- Report quantitative and qualitative results from tuberculin skin test or blood-based tests for children <5 years of age diagnosed with LTBI
- Report patient follow-up and hospital discharge plans
- Civil surgeons must report applicants diagnosed with LTBI
- Detailed requirements can be found on our website

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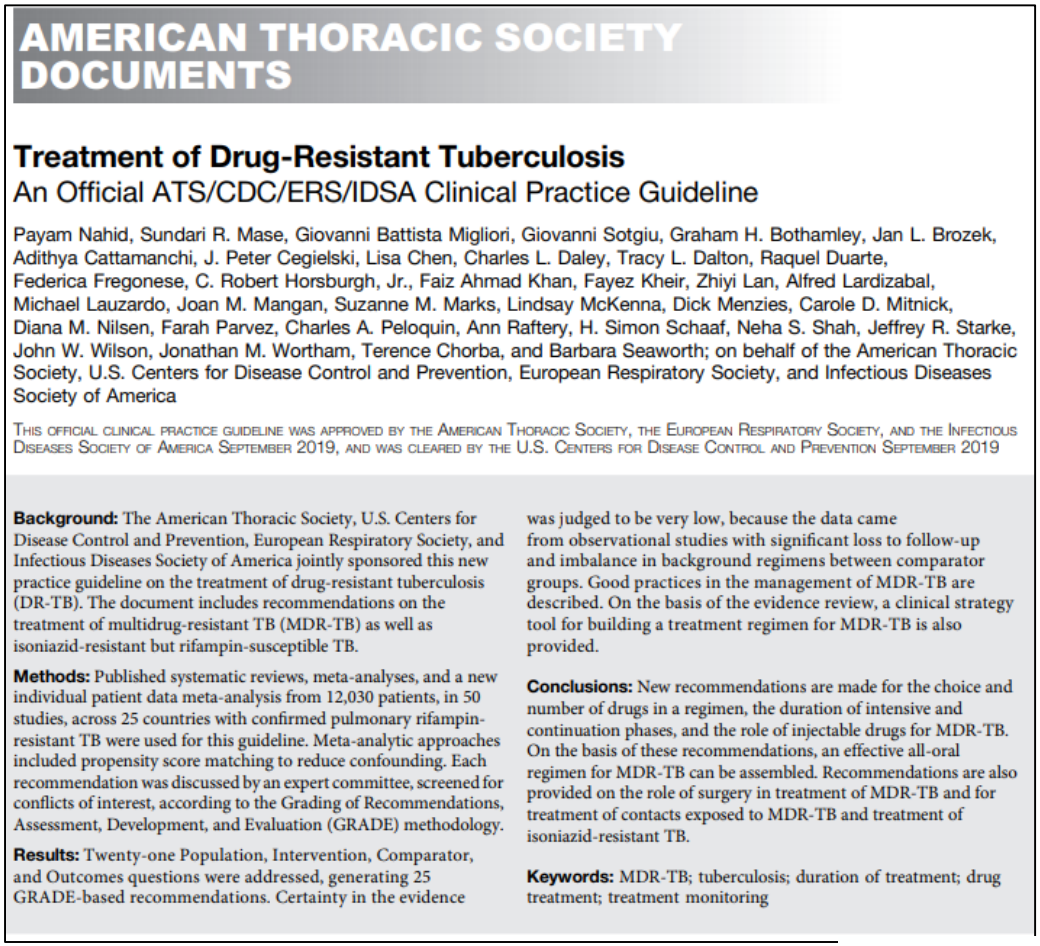
MDR-TB UPDATES

ATS: NEW MDR-TB TREATMENT GUIDELINES

- New MDR-TB treatment guidelines from the ATS/CDC/ERS/IDSA
- Guidelines recommend **all oral regimens**
- Outline new suggestions for **building treatment regimens**



AMERICAN THORACIC SOCIETY DOCUMENTS

Treatment of Drug-Resistant Tuberculosis

An Official ATS/CDC/ERS/IDSA Clinical Practice Guideline

Payam Nahid, Sundari R. Mase, Giovanni Battista Migliori, Giovanni Sotgiu, Graham H. Bothamley, Jan L. Brozek, Adithya Cattamanchi, J. Peter Cegielski, Lisa Chen, Charles L. Daley, Tracy L. Dalton, Raquel Duarte, Federica Fregonese, C. Robert Horsburgh, Jr., Faiz Ahmad Khan, Fayez Kheir, Zhiyi Lan, Alfred Lardizabal, Michael Lauzardo, Joan M. Mangan, Suzanne M. Marks, Lindsay McKenna, Dick Menzies, Carole D. Mitnick, Diana M. Nilsen, Farah Parvez, Charles A. Peloquin, Ann Raftery, H. Simon Schaaf, Neha S. Shah, Jeffrey R. Starke, John W. Wilson, Jonathan M. Wortham, Terence Chorba, and Barbara Seaworth; on behalf of the American Thoracic Society, U.S. Centers for Disease Control and Prevention, European Respiratory Society, and Infectious Diseases Society of America

This official clinical practice guideline was approved by the American Thoracic Society, the European Respiratory Society, and the Infectious Diseases Society of America September 2019, and was cleared by the U.S. Centers for Disease Control and Prevention September 2019

Background: The American Thoracic Society, U.S. Centers for Disease Control and Prevention, European Respiratory Society, and Infectious Diseases Society of America jointly sponsored this new practice guideline on the treatment of drug-resistant tuberculosis (DR-TB). The document includes recommendations on the treatment of multidrug-resistant TB (MDR-TB) as well as isoniazid-resistant but rifampin-susceptible TB.

Methods: Published systematic reviews, meta-analyses, and a new individual patient data meta-analysis from 12,030 patients, in 50 studies, across 25 countries with confirmed pulmonary rifampin-resistant TB were used for this guideline. Meta-analytic approaches included propensity score matching to reduce confounding. Each recommendation was discussed by an expert committee, screened for conflicts of interest, according to the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) methodology.

Results: Twenty-one Population, Intervention, Comparator, and Outcomes questions were addressed, generating 25 GRADE-based recommendations. Certainty in the evidence was judged to be very low, because the data came from observational studies with significant loss to follow-up and imbalance in background regimens between comparator groups. Good practices in the management of MDR-TB are described. On the basis of the evidence review, a clinical strategy tool for building a treatment regimen for MDR-TB is also provided.

Conclusions: New recommendations are made for the choice and number of drugs in a regimen, the duration of intensive and continuation phases, and the role of injectable drugs for MDR-TB. On the basis of these recommendations, an effective all-oral regimen for MDR-TB can be assembled. Recommendations are also provided on the role of surgery in treatment of MDR-TB and for treatment of contacts exposed to MDR-TB and treatment of isoniazid-resistant TB.

Keywords: MDR-TB; tuberculosis; duration of treatment; drug treatment; treatment monitoring

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PREFERRED DRUGS FOR MDR-TB LONGER REGIMENS

BETTER

Drug / Drug Class	Recommendation		Certainty in the evidence	Relative (95% CI) Death	Relative (95% CI) Success
	FOR	AGAINST			
Bedaquiline *	Strong		Very Low	aOR 0.4 (0.3 to 0.5)	aOR 2.0 (1.4 to 2.9)
Fluoroquinolone: Moxifloxacin	Strong		Very Low	aOR 0.5 (0.4 to 0.6)	aOR 3.8 (2.8 to 5.2)
Fluoroquinolone: Levofloxacin	Strong		Very Low	aOR 0.6 (0.5 to 0.7)	aOR 4.2 (3.3 to 5.4)
Linezolid	Conditional		Very Low	aOR 0.3 (0.2 to 0.3)	aOR 3.4 (2.6 to 4.5)
Clofazimine	Conditional		Very Low	aOR 0.8 (0.6 to 1.0)	aOR 1.5 (1.1 to 2.1)
Cycloserine	Conditional		Very Low	aOR 0.6 (0.5 to 0.6)	aOR 1.5 (1.4 to 1.7)
Injectables: Amikacin	Conditional		Very Low	aOR 1.0 (0.8 to 1.2)	aOR 2.0 (1.5 to 2.6)
Injectables: Streptomycin	Conditional		Very Low	aOR 0.8 (0.6 to 1.1)	aOR 1.5 (1.1 to 2.1)
Ethambutol	Conditional		Very Low	aOR 1.0 (0.9 to 1.2)	aOR 0.9 (0.7 to 1.1)
Pyrazinamide	Conditional		Very Low	aOR 0.7 (0.6 to 0.8)	aOR 0.7 (0.5 to 0.9)
Injectables: Carbapenems w/ clavulanic acid	Conditional		Very Low	aOR 1.0 (0.5 to 1.7)	aOR 4.0 (1.7 to 9.1)
Delamanid	Concur with WHO conditional recommendation				

*Approved by the U.S. Food and Drug Administration for use in the treatment of TB.

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NOT RECOMMENDED FOR MDR-TB LONGER REGIMENS

Drug / Drug Class	Recommendation		Certainty in the evidence	Relative (95% CI) Death	Relative (95% CI) Success
	FOR	AGAINST			
Ethionamide Prothionamide		Conditional	Very Low	aOR 0.9 (0.8 to 1.0)	aOR 0.8 (0.7 to 0.9)
Injectables: Kanamycin		Conditional	Very Low	aOR 1.1 (0.9 to 1.2)	aOR 0.5 (0.4 to 0.6)
P-Aminosalicylic Acid		Conditional	Very Low	aOR 1.2 (1.1 to 1.4)	aOR 0.8 (0.7 to 1.0)
Injectables: Capreomycin		Conditional	Very Low	aOR 1.4 (1.1 to 1.7)	aOR 0.8 (0.6 to 1.1)
Macrolides: Azithromycin Clarithromycin		Strong	Very Low	aOR 1.6 (1.2 to 2.0)	aOR 0.6 (0.5 to 0.8)
Amoxicillin-clavulanate		Strong	Very Low	aOR 1.7 (1.3 to 2.1)	aOR 0.6 (0.5 to 0.8)

WORSE

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INTENSIVE PHASE

Use at least **5** drugs in the intensive phase of MDR-TB treatment

Table 3. Propensity Score–matched Analysis of the Number of Drugs in the Intensive Phase of Treatment and the aOR of Treatment Success versus Failure or Relapse

No. of Drugs	No. of Patients		Propensity Score–matched Analysis	
	Success/Total (%)	Death/Total (%)	aOR (95% CI)	Risk Difference (95% CI) (%)
For the analysis of success vs. fail*/relapse†				
0–2 drugs	1,097/1,236 (88.8)	—	1.0 (reference)	
3 drugs	1,257/1,407 (89.3)	—	1.7 (1.4 to 2.0)	6 (4 to 7)
4 drugs	1,657/1,847 (89.7)	—	1.2 (1.4 to 2.0)	8 (6 to 9)
5 drugs	926/986 (93.9)	—	3.0 (2.3 to 3.9)	8 (7 to 10)
⩾6 drugs	523/568 (92.1)	—	2.3 (1.6 to 3.1)	4 (1 to 7)
For the analysis of death vs. success/fail*/relapse†				
0–2 drugs	—	205/1,441 (14.2)	1.0 (reference)	
3 drugs	—	233/1,640 (14.2)	0.9 (0.8 to 1.1)	−1 (−3 to 1)
4 drugs	—	345/2,192 (15.7)	1.1 (0.9 to 1.2)	−3 (−5 to −1)
5 drugs	—	104/1,090 (9.5)	0.6 (0.5 to 0.7)	−2 (−3 to 0)
⩾6 drugs	—	54/622 (8.6)	0.5 (0.4 to 0.7)	2 (−0 to 5)

Definition of abbreviations: aOR = adjusted odds ratio; CI = confidence interval.
*World Health Organization definitions: fail = treatment terminated or need for permanent regimen change of at least two antituberculosis drugs because of: lack of conversion by the end of the intensive phase, bacteriological reversion in the continuation phase after conversion to negative, evidence of additional acquired resistance to fluoroquinolones or second-line injectable drugs or adverse drug reactions.
†Relapse was defined as a positive bacteriological culture in the 12 months after treatment completion.

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CONTINUATION PHASE

Use at least **4** drugs in the continuation phase of MDR-TB treatment

Table 4. Propensity Score–matched Analysis of the Number of Drugs in the Continuation Phase of Treatment and the aOR of Treatment Success versus Failure or Relapse

No. of Drugs	No. of Patients		Propensity Score–matched Analysis	
	Success/Total (%)	Death/Total (%)	aOR (95% CI)	Risk Difference (95% CI) (%)
For the analysis of success vs. fail*/relapse†				
0–1 drug	1,017/1,144 (88.9)	—	1.0 (reference)	
2 drugs	1,272/1,425 (89.2)	—	1.1 (0.9 to 1.3)	1 (−1 to 3)
3 drugs	1,623/1,810 (89.7)	—	1.2 (1.0 to 1.4)	3 (1 to 5)
4 drugs	816/864 (94.4)	—	2.3 (1.7 to 3.1)	3 (1 to 5)
⩾5 drugs	346/383 (90.3)	—	1.2 (0.9 to 1.8)	−4 (−8 to −1)
For the analysis of death vs. success/fail*/relapse†				
0–1 drug	—	187/1,331 (14.0)	1.0 (reference)	
2 drugs	—	193/1,618 (11.9)	0.8 (0.6 to 0.9)	−3 (−5 to −1)
3 drugs	—	307/2,117 (14.5)	1.0 (0.8 to 1.1)	−4 (−5 to −2)
4 drugs	—	78/942 (8.3)	0.5 (0.4 to 0.7)	−1 (−4 to 1)
⩾5 drugs	—	37/420 (8.8)	0.5 (0.4 to 0.8)	5 (1 to 8)

Definition of abbreviations: aOR = adjusted odds ratio; CI = confidence interval.
*World Health Organization definitions: fail = treatment terminated or need for permanent regimen change of at least two anti-tuberculosis drugs because of: lack of conversion by the end of the intensive phase, bacteriological reversion in the continuation phase after conversion to negative, evidence of additional acquired resistance to fluoroquinolones or second-line injectable drugs or adverse drug reactions.
†Relapse was reported as a positive bacteriological culture in the 12 months after treatment completion.

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BEST PRACTICES FOR BUILDING TREATMENT REGIMENS

- TB expert medical consultation is recommended
- Build a regimen using 5 or more drugs to which the isolate is susceptible (or has low likelihood of resistance)
- Choice of drugs is contingent on capacity to monitor for significant adverse effects, patient comorbidities, and preferences/values
- In children with TB disease who are contacts of persons with MDR-TB, use susceptibility results from the source patient's isolate if not available for the child

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STEPS FOR BUILDING TREATMENT REGIMENS

Step 1: Choose one later-generation fluoroquinolone

Levofloxacin
OR
Moxifloxacin

Step 2: Choose both of these prioritized drugs

Bedaquiline
AND
Linezolid

Step 3: Choose both of these prioritized drugs

Clofazimine
AND
Cycloserine/terizidone

Step 4: If a regimen cannot be assembled with five effective oral drugs, and the isolate is susceptible, use one of these injectable agents

Amikacin
OR
Streptomycin

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STEPS FOR BUILDING TREATMENT REGIMENS

Step 5: If needed or if oral agents preferred over injectable agents in Step 4, use the following drugs

Delamanid
Pyrazinimide
Ethambutol

Step 6: If limited options and cannot assemble a regimen of five effective drugs, consider use of the following drugs

Ethionamide or prothionamide
Imipenem-cilastatin/clavulanate or meropenem/clavulanate
p-Aminosalicylic acid
High-dose isoniazid

The following drugs are no longer recommended for inclusion in MDR-TB regimens

Capreomycin and kanamycin
Amoxicillin/clavulanate (when used without a carbapenem)
Azithromycin and clarithromycin

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TREATMENT OF CONTACTS EXPOSED TO MDR-TB

Should contacts of infectious patients with MDR-TB be offered LTBI treatment vs followed with observation alone?

- Recommend offering LTBI treatment
- Suggest 6 to 12 months of treatment
  - Later-generation fluoroquinolone alone; OR
  - Add a 2nd drug, based on relevant susceptibility results
  - Pyrazinamide should not be routinely used as the 2nd drug, based on evidence of increased toxicity and adverse events

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BTBC UPDATES

BTBC UPDATES

- Implemented pilot program using **telemedicine for LTBI treatment**
- Demonstrated the **cost savings associated with video DOT**
- Established a **Contact Case Management Unit** dedicated to coordinating the evaluation of household contacts
  - Trained staff and rolled out **HIV testing** for contacts in household settings

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BTBC UPDATES

- Implemented **syndromic surveillance** to find patients lost to care
  - Since July 2018, 12 patients were returned to TB care
- Ongoing **outbreak investigations** and **contact tracing**

REPORTING AND SURVEILLANCE

OUTBREAK DETECTION AND RESPONSE

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NEW RESOURCES

- Developing a **detailing kit** with provider resources on testing and treatment for LTBI, including short-course regimens
- Planning a **TB patient support group**

OUTREACH AND EDUCATION

CASE MANAGEMENT

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HOPEFUL DEVELOPMENTS IN TB CARE

EXCITING AVENUES OF RESEARCH

- Promising **TB vaccine**
- TBTC Study 37 for **shorter LTBI treatment**
- WHO testing **9-12 month treatment regimens**
- New **6 month treatment** for MDR-TB
  - BPaL: bedaquiline, pretomanid, and linezolid
  - 2 Bellevue Hospital patients are currently on the BPaL regimen

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RECENT RESULTS FROM THE NIX-TB STUDY

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 MARCH 5, 2020 VOL. 382 NO. 10

Treatment of Highly Drug-Resistant Pulmonary Tuberculosis

Francesca Conradie, M.B., B.Ch., Andreas H. Diacon, M.D., Nosipho Ngubane, M.B., B.Ch., Pauline Howell, M.B., B.Ch., Daniel Everitt, M.D., Angela M. Crook, Ph.D., Carl M. Mendel, M.D., Erica Egizi, M.P.H., Joanna Moreira, B.Sc., Juliano Timm, Ph.D., Timothy D. McHugh, Ph.D., Genevieve H. Wills, M.Sc., Anna Bateson, Ph.D., Robert Hunt, B.Sc., Christo Van Niekerk, M.D., Mengchun Li, M.D., Morounfolu Olugbosi, M.D., and Melvin Spigelman, M.D., for the Nix-TB Trial Team*

CONCLUSIONS

The combination of bedaquiline, pretomanid, and linezolid led to a favorable outcome at 6 months after the end of therapy in a high percentage of patients with highly drug-resistant forms of tuberculosis; some associated toxic effects were observed.

Combination of bedaquiline, pretomanid, and linezolid

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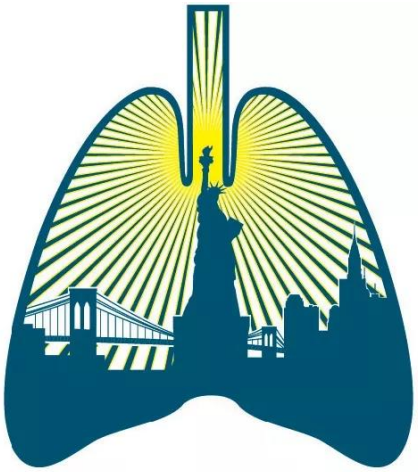
BTBC IS HERE TO SUPPORT YOU

- Reach out to the **TB Provider Hotline** (844) 713-0559
- Connect your patients with **We Are TB** through www.wearetb.com or email info@wearetb.com
- Please join us! The **NYC TB Coalition** meets quarterly. Contact us at tboutreach@health.nyc.gov



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ACKNOWLEDGEMENTS

- Thank you to Dr. Diana Nilsen, Dr. Farah Parvez, and Dr. Barbara Seaworth for contributing information and expertise to this presentation.
- Thank you to all **BTBC staff and community partners** who advocate and provide excellent care for TB patients in NYC.
- Special thanks to all **BTBC staff who have taken on emergency response duties and the health care workers and emergency personnel** around the City responding to the COVID-19 pandemic.

NYC Health

BEST WISHES

Dr. Germaine Jacquette

with deepest gratitude
for your contributions to
TB prevention and care

&

our best wishes for your
retirement

It is a challenging and uncertain time in NYC and across the world, but I thank you for the work you do. You are all critical to achieving our mission of preventing the spread of TB and eliminating TB as a public health problem in New York City. Although we are in the midst of a pandemic, our work is as essential as ever.

END TB NYC

Thank you!

TB PROVIDER HOTLINE: (844) 713-0559

NYC TB COALITION: TBOUTREACH@HEALTH.NYC.GOV

WE ARE TB: INFO@WEARETB.COM

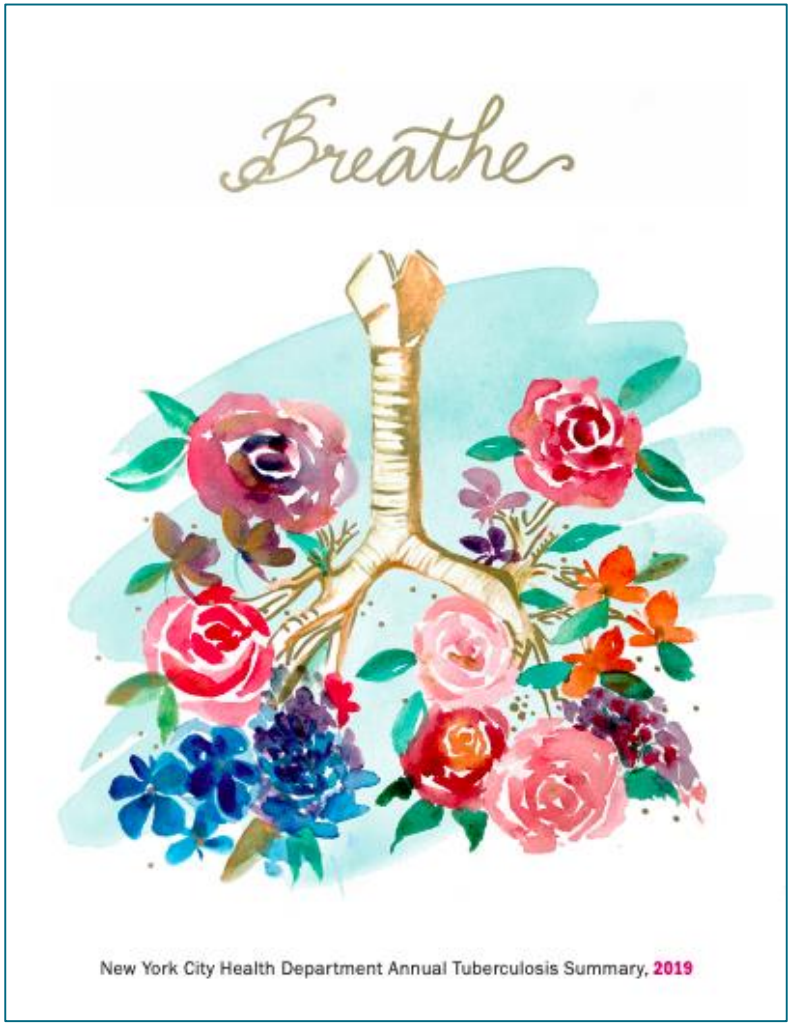
END TB NYC

BTBC 2019 ANNUAL REPORT

To access our annual report, use the camera on your phone to scan this QR code:

Or go here:

https://www1.nyc.gov/assets/doh/downloads/pdf/tb/tb2019.pdf



Artwork by Dr. Sneha

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