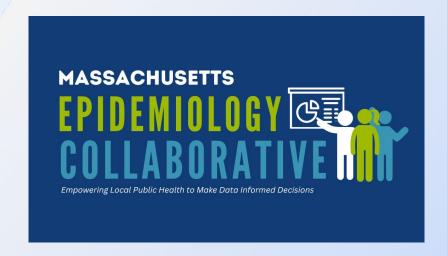
How Epidemiologists Can Assist Local Public Health Nurses (LPHNs) in TB Investigations

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MA Epidemiology Collaborative

Agenda

- 1. Introductions
- 2. Background
- 3. Epidemiology
- 4. Legislation: 105 CMR 365.00
- 5. Case Study
- 6. Additional Resources







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What is Tuberculosis (TB)?

- TB is caused by a bacterium called *Mycobacterium tuberculosis*
- TB usually affects the lungs but can also affect other parts of the body, such as the brain, the kidneys, or the spine
 - TB can affect multiple parts of the body at the same time
- Not everyone infected with TB germs becomes sick. As a result, two TB-related conditions exist:
 - Latent TB infection (LTBI)
 - Active TB disease

Latent TB

VS

Active TB

No Symptoms



May Have Cough, Chest Pain, and Fatigue

Not Contagious



30

Can Be Spread to Others

Treated With Antibiotic for 3–4 Months



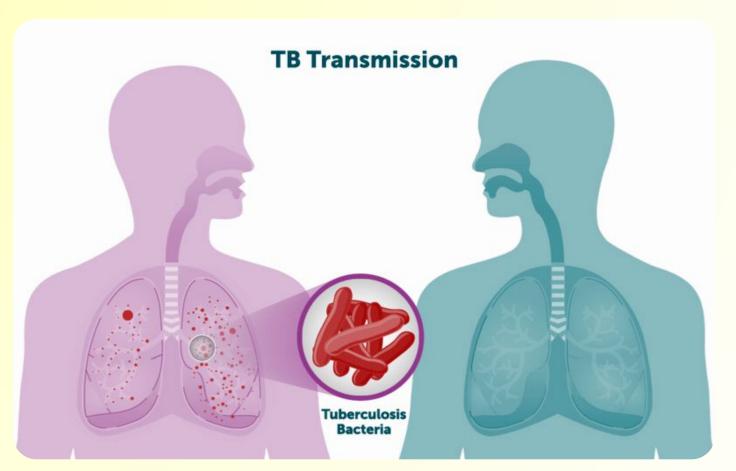
Treated With Antibiotic Combo for 4–9 Months

Can Progress to Active TB





Can Be Deadly if Not Treated



https://www.cdc.gov/tb/causes/index.html

TB RISK FACTORS

As per the CDC, **ANYONE** can get **TB**. People at higher risk for acquiring **TB**:





Travel to or were born in countries where TB is common (listed on following Epidemiology slides)

Recently spent time with or live with a person who has active disease





Live or used to live in large group settings where TB is more common, such as correctional facilities & congregate shelters



Work in places where TB is more likely to spread, such as certain healthcare settings, congregate shelters, nursing homes, and correctional facilities



Have a weaker immune system because of certain medications or health conditions, such as diabetes, cancer, and HIV



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TB Diagnosis

TB diagnosis can be complicated, as a licensed clinician must confirm the case. While TB tests can help determine whether a case is latent or active, they aren't definitive

Latent TB Infection (LTBI):

- IGRA (blood test, gold-standard) or TST (skin test)
- No symptoms: usually normal chest x-ray (CXR)

Active TB Disease:

- Symptoms: cough, fever, weight loss, night sweats
- Chest x-ray: lung abnormalities
- Microbiology: sputum smear, culture, or molecular tests confirm infection

TB Classifications: New Arrivals*

Class A: Active Disease

- Individuals with active disease who may not have completed adequate treatment or may be considered infectious
 - Not the focus of today's presentation

Class B: Latent Infection

- BO: recently treated TB disease
- B1: Significant findings, no signs of infectiousness
- B2: LTBI
- B3: TB contact

*Individuals are tested for TB during immigration if they are seeking permanent residence (i.e., immigrants, refugees). Temporary visa holders are typically not screened.

TB Classifications: New Arrivals

For additional questions on how TB cases appear in MAVEN, please see:

MAVEN Help Videos from MDPH:

- Division of Global Populations Class A/B Update: Anna Hippchen, Michael Boyer, and Sergut Wolde-Yohannes (9/24/24) https://register.gotowebinar.com/recording/6520861958519460096
- Division of Global Populations Annual LBOH Webinar (4/9/2024): Falah Hashem, Anna Hippchen, Sergut Wolde-Yohannes, Kavita Gadani Seabe, Michael Boyer https://register.gotowebinar.com/recording/6019653977237722626

TB Treatment

This is person-specific and depends on several factors. We won't go into detail about the different treatments, but here are a few points to provide context for future slides:

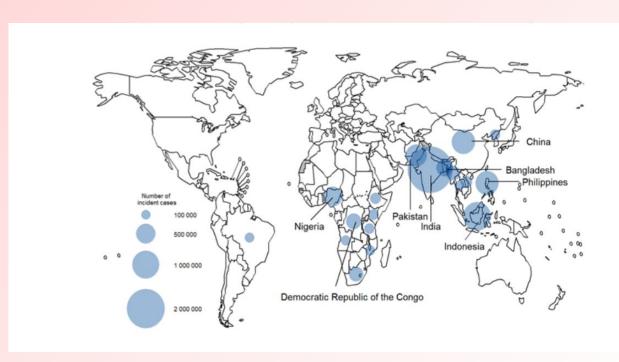
- The four most common first-line medications for TB treatment:
 - Rifampin (RIF)
 - Isoniazid (INH)
 - Pyrazinamide (PZA)
 - Ethambutol (EMB)
- DOT (<u>Direct Observed Therapy</u>): A method for treating TB where a healthcare worker watches the patient swallow each dose of their prescribed medication. This ensures that the patient takes their full course of medicine, which is crucial for curing TB and preventing the spread of drug-resistant TB.

Epidemiology

Epidemiology of TB: Global TB Trends (Active Disease)

(WHO, 2022)

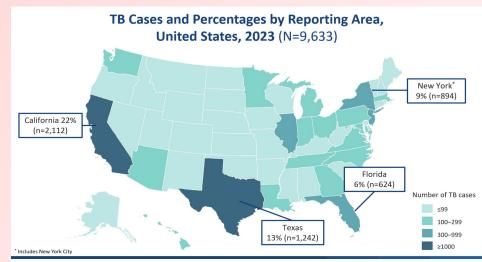
- Total cases & incidence: 10.6M people developed TB in 2022 (~133/100k); increase vs 2020–21
- Regional distribution: SE Asia (46%), Africa (23%), W. Pacific (18%), smaller in Americas & Europe
- Top 8 countries: India, Indonesia, China, Philippines, Pakistan, Nigeria, Bangladesh, DRC ≈ ²/₃ of global cases
- Trends & drivers: COVID-19 disruptions → underdiagnosis (2020-21) → rebound in 2022
- Drug resistance: Multidrug Resistant TB (MDR/RR-TB) remains major challenge (see WHO report)

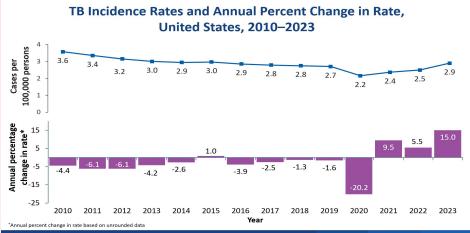


Epidemiology of TB: In the US

(CDC, 2023)

- Cases & incidence: 9,633 TB cases in 2023 (2.9/100,000); ~15% increase vs 2022, returning to 2013 levels
- Geographic distribution: 4 states (CA, TX, NY, FL) = ~50% of cases. MA incidence = 3.2/100.000
- Drug resistance: 588 isoniazid (INH) resistant, 100 MDR-TB cases; molecular testing included since 2023
- Directly observed therapy (DOT): A
 healthcare worker watches the patient
 take each TB dose to ensure the medicine
 is taken correctly and treatment stays on
 track
 - Widely used, 95% treatment completion goal
 - Standard practice in USA





Epidemiology of TB: In MA

- **Total cases & incidence:** 254 active TB cases; 3.6 per 100,000 population \rightarrow 13% increase vs 2023 (national rate 3.0/100,000)
- Demographics & risk groups:
 - 90% non-U.S.-born; 10% U.S.-born
 - 90% cases in racial/ethnic minorities (Risk ratio[RR] vs white non-Hispanic: Asian 29.8×, Black 34.6×, Hispanic 11.6×)
 - Children <15 yrs: 5 cases (<1/100,000)
 - Unhoused individuals: 22 cases (9%)
 - HIV co-infection: 9 cases (4%)
 - Known contacts to previous TB cases: 15 (6%)
- Clinical & diagnostic features:
 - Pulmonary: 61%; Extrapulmonary: 11%; Both: 28%
 - Cavitary disease: 31%; Non-cavitary: 53%
- Drug resistance (culture-confirmed, N=194):
 - Any resistance: (27%); INH-resistance: (15%); MDR-TB: 3 cases: (2%)

Geographic TB Case distribution

Case Counts and Percent Distribution

TB Case Distribution - Key Insights

- 60% of TB cases are from Suffolk, Middlesex, and Essex counties
- Suffolk (Boston) reports the highest number of cases
- Dukes County has a high rate, but very few actual cases
- Case counts + percentages together give a clearer picture

Why this matters:

- Helps target resources to high-activity areas
- Prevents misinterpretation in small counties (e.g., Dukes) due to small population sizes

(=254 Cases) Suffolk 66 26.0% Middlesex 63 24.8% 29 11.4% Essex Norfolk 28 11.0% 10.2% 26 Worcester Plymouth 25 9.8% Bristol 8 3.1% Hampden 4 1.6% Dukes <5 1.6% Hampshire 2 0.8% Franklin 0.8% 2 Barnstable 0% 0 Berkshire 0 0% Nantucket 0% 0

No of Cases

% of State Total

County

Information obtained from: MDPH, 2024

Tuberculosis Legislation 105 CMR 365.00

105 CMR 365.00: TB Case Management Outside of Hospitals

Reference:

 "Case management for tuberculosis is the coordination of medical, nursing, outreach, adherence support, and social service systems to ensure appropriate therapy and completion of treatment for all persons with confirmed or suspected TB"

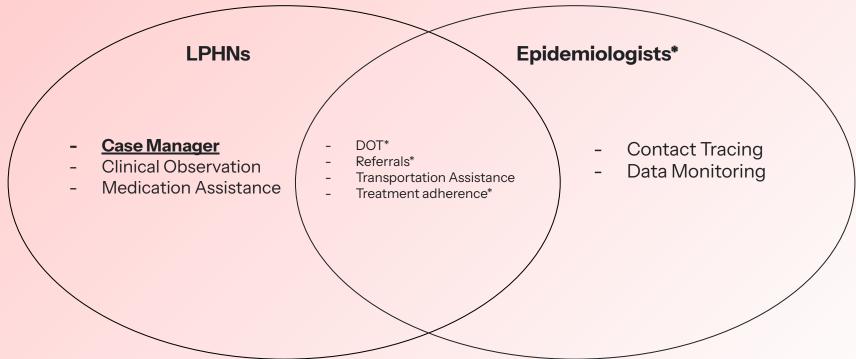
Key Points (per 105 CMR 365.200):

- Every TB case must have a local nurse case manager designated by the local board of health
- The nurse case manager leads case management and develops the care plan
- Local epis may provide referrals but cannot perform DOT or medication management without a Local Public Health Nurse (LPHN)
- Initial case assessment and contact investigation must begin within 3 business days of notification
- The LPHN remains responsible for overseeing DOT and may delegate specific tasks to epidemiologists or community health workers, <u>as appropriate to their scope of</u> <u>practice</u>

PHNs MUST Fulfill the Role of Case Management:

LPHNs may delegate other tasks to Community Health Workers (CHWs) and Epis on an as-needed basis

For example, in the context where an LBOH has an epidemiologist on staff:



^{*}Epis can only do these case management activities under the management of a PHN and only work within their authorized scope of practice NOTE: Community Health Workers may also assist with transportation assistance, education, and home visits

Case Study

Case #1: Pediatric LTBI

Scenario: Local Board of Health (LBOH) received notification of a positive IGRA in a Child <5 from local pediatrician's office. Child was US born, but lived overseas for 2+ years. Child was taken for IGRA testing upon return to the US as precaution by parents, even though it was not required. Child asymptomatic.

Actions Required: Establish baseline understanding of TB workflows, identify and use available resources (MAVEN, providers, state/regional TB staff), collect and document demographic & risk history as available

Day 1-2 Initial Steps & Risk History

- Reviewed MAVEN lab report
- Contacted ordering provider to confirm results
- Confirmed date of chest x-ray (CXR)
- Collected demographics & risk history:
 - Household TB history
 - Prior TB treatment
 - Country of birth/origin
 - Recent travel

Week 1-2 Care Coordination

- Connected with treating providers and hospital infection preventionist (IP)
- Confirmed CXR results w/ ordering provider (OP)
- Confirmed treatment plan (e.g., rifampin [RIF] daily/4mos)
- No referral to the TB clinic needed

Pediatric LTBI

Scenario: Positive IGRA in child <5 y.o.

Actions Required: Establish baseline understanding of TB workflows, identify and use available resources (MAVEN, providers, state/regional TB staff), collect and document demographic & risk history as available

Week 2-3 Consultation with State TB Team

- Discussed case with State TB Nurse, State Direct Services Coordinator, and our Regional Nurse Consultant
- Determined this specific case did not require DOT due to:
- Results from CXR, complex past medical history, and their ongoing specialized/personalized care by multiple physicians (specialists & infectious disease doctors)
- Please note: You should always follow up with your State TB Nurse regarding pediatric cases that may need DOT, such as those under the age of 5. DOT may be determined on a case-by-case basis.

Ongoing Monitoring & Documentation

- Monthly follow-up with treating provider/IP for adherence
- Enter updates into MAVEN question packages
- Continue collaboration with state/regional
 TB team as needed until end of treatment
- Work with the Local PHN to update event notes frequently
- Task monthly to remind self or Local PHN to follow up with ordering provider and/or infection prevention to conduct treatment adherence calls

Pediatric LTBI

Key Takeaways

- TB case management is nurse-led per 105 CMR 365.200
- Local epis play a vital support role in coordination, documentation, and communication
- Always consult the State TB Nurse for pediatric or complex cases before determining DOT needs
- Collaboration across local, regional, and state levels ensures timely, compliant, and patient-centered TB care

Local Epi Role

- Support the Local PHN and State TB Team through coordination and communication
- Collect and document key demographic and risk information in MAVEN
- Facilitate provider contact to confirm labs, CXR results, and treatment plan
- Assist with referrals and ongoing data entry
- Maintain case continuity by setting follow-up reminders and updating event notes

Case #2 B1 Arrival: Positive TB diagnosis with Family Hesitancy & Language Barriers

Scenario:

- Adult Female, arrived in the US as a B1 immigrant from a country with high TB prevalence
- Overseas screening: Abnormal chest X-ray; sputum smear negative
- Barriers: Language difficulties and family mistrust of outreach calls
- Support: Required interpreter and community health worker (CHW) involvement throughout the process

Timeline & Actions:

Initial Contact Phase:

- State TB team reviewed overseas records and notified local health department
- Local epi attempted multiple calls but the family declined to speak, believing the outreach might be a scam
- A community health worker fluent in the family's language was engaged to assist with communication

Trust-Building & Engagement Phase:

- CHW conducted a home visit, introduced the public health role, and explained confidentiality and purpose of the evaluation
- Family was encouraged to verify the health department's number before proceeding; they called and spoke with the local epi
- After reassurance and TB education, the family agreed to proceed with testing

B1 Arrival: Positive TB diagnosis with Family Hesitancy & Language Barriers

Diagnosis & Coordination Phase:

- IGRA testing was completed and returned positive.
- Local epi placed a referral to TB clinic for further evaluation.
- Repeat CXR and specimen collection were completed; sputum and culture confirmed TB disease.
- Epi and CHW jointly arranged interpreter services and transportation for clinic visits.

Treatment & follow-up Phase:

- The State TB Nurse initiated Directly Observed Therapy (DOT) at home, assisted by the local epi.
- CHW provided ongoing language and cultural support, helping the family understand the importance of treatment adherence.
- Epi documented all updates in MAVEN, coordinated with state staff, and monitored for any close contact evaluations and investigations for close family members.
- Treatment is ongoing; the case remains open until completion and confirmation of cure.

PHN & CHW Roles:

- PHN: Conducted DOT, symptom monitoring, and treatment adherence counseling.
- CHW: Provided language interpretation, trust-building, and ongoing family support.

B1 Arrival: Positive TB diagnosis with Family Hesitancy & Language Barriers

Local Epi Role:

- Coordinated interpreter services, transportation, and CHW support to overcome language and cultural barriers.
- Maintained comprehensive documentation in MAVEN and support PHNs with case tracking and follow-up.
- Engaged the family through trust building, education, and facilitating acceptance of testing and treatment.
- Collaborated with PHN, CHW, and state TB staff for DOT initiation, contact investigations and continuity of care.

Key Takeaways:

- Language barriers and mistrust can delay evaluation- trusted community partners are essential.
- CHW involvement can significantly improve engagement and adherence.
- Joint coordination among epi, PHN, CHW, and state staff ensures continuity and cultural sensitivity.
- Early verification and transparency build long-term trust with families and communities.

"What If" Scenario - Active TB

Patient arrives in Massachusetts classified as **B1**. Initial outreach is difficult. Later confirmed with **active TB** (could be MDR-TB). Lives with one roommate who will require screening.

Requires immediate treatment, intensive monitoring, and contact investigation.

Day 1-2

- State PHN & State Direct Services
 Coordinator: Reviews B1 report, alerts local
 team
- Local PHN: Attempts contact; delegates referral to Local Epi due to flu clinic workload
- Local Epi: Files clinic referral, sends welcome letter with appointment details, documents in MAVEN

Week 1-2

- Local Epi: Ensures risk factor documentation, flags a roommate for contact testing. Coordinates with State CHW (case & roommate are unresponsive)
- **Local PHN:** Coordinates clinic evaluation and sputum testing. Arranges interpreter or transport if needed. Conducts initial phone call with the case.
- State CHW: Assists outreach, locates patient, conducts home-visit, explains next steps
- Clinic: Confirms active TB; reports to MDPH
- **State PHN:** Reviews diagnosis & labs, initiates treatment planning

"What If" Scenario - Active TB

Patient arrives in Massachusetts classified as **B1**. Initial outreach is difficult. Later confirmed with **active TB** (could be MDR-TB). Lives with one roommate who will require screening.

Month 1-2

- **Local PHN:** Initiates DOT, monitors side effects, ensures documentation in MAVEN.
- State PHN: Reviews drug susceptibility testing (DST) results, consults on MDR-TB. management. Communicates with LPHN to discuss treatment plan regularly. Creates MAVEN event for contact and tasks referral to LBOH.
- Local Epi: Maintains documentation and ensures ongoing coordination. Refers roommate to clinic & documents in MAVEN, ensures roommate is seen by clinic.
- **State CHW:** Supports adherence and connects patient to social supports.

Ongoing/Conclusion (Month 9-10)

- Local PHN: Continues managing video DOT (vDOT), patient is compliant, and completes final case review.
- Local Epi: Finalizes records in MAVEN, ensures contact complete testing, assists LPHN with vDOT, relays side effects to LPHN as needed.
- State PHN: Reviews DSTs, confirms documentation is accurate, and confirms cure and case closure.
- State CHW: Provides closure education and transition support.

"What If" Scenario – Active TB

Patient initially classified as **B1** now confirmed with **active TB** (or **MDR-TB**). Requires **immediate treatment, intensive monitoring, and contact investigation.**

Weekly Coordination:

- Multidisciplinary case calls: State PHN, Local PHN, Local Epi, State CHW
- Review of clinical progress, contacts, and adherence barriers
- Shared updates documented in MAVEN

Communication & Access:

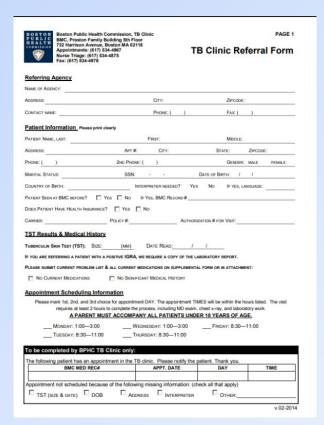
- Unified messaging to patient/family
- Language, transportation, and housing needs addressed collaboratively
- CHW supports continuity during isolation/treatment

Key Takeaways:

- Collaboration intensifies after disease confirmation
- Clear roles ensure fast, coordinated public health response
- LPHN delegates additional tasks as needed to local staff within their scope of practice
- Local logistics + State clinical oversight =
 Successful case management

Referral Forms Examples

BMC TB clinic



(Patient)	Name) (I	Date of Birth)
The BPHC TB Clinic has received a request for an a To schedule an appointment, the following informati		d above.
□ TUBERCULIN SKIN TEST (MANTOUX. PE The size of the TST is critical in determining tient's verbal report of a positive reaction. For a repeat TST must be done or approvat g an appointment. Please contact the clinic troncers.	appropriate treatment. The TB of or all patients with an undocumer given by the TB clinic allowing for	ited history of a "positive" TST, or exclusion prior to receiving
SIZE (MM INDURATION)	DATE READ	
MEDICAL PROBLEM LIST		
1	5.	
2		
3		
4	8.	
□ No significant medical history □ CURRENT MEDICATIONS (DOSAGE AND		
CURRENT MEDICATIONS (DOSAGE AND 1	FREQUENCY) 5 6	
□ No significant medical history □ CURRENT MEDICATIONS (DOSAGE AND 1. 2. 3.	5	
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CURRENT MEDICATIONS (DOSAGE AND 1	s	iny chest radiographs or

- Referral processes differ by facility
- No standardized state form
- Forms may not be listed in MAVEN
- Encouraged to maintain direct communication with TB/pulmonary clinics

Additional Resources

Class AB Tracking Checklist

- Purpose: Helps track steps in TB case management and stay organized
- Usefulness: Especially helpful when managing multiple cases
- Note: Not a case management tool- more of a workflow/organizational aid

	Ma	ssachusetts Class AB Tracking Checklist			
within 30 days of yo located within 30 da successfully make of	ur receiving the notification ys please fax this checklist ontact and schedule a clinic	reciates all efforts made to locate and evalua packet Please use this checklist as a guide to the TB Division together with the comple visit, please fill in the date and time of the a IJAL FAX: 617-983-6540 OR 617-983-6	for follow-up. If a new arrival can not be ted TB Follow-up Worksheet. If you ppointment where indicated below and fax		
Arrival Name:			MAVEN ID:		
	Packet Received - Date:				
		t and specific instructions for this specific T	P. Classification		
	Within 24 hours of receiving notification packet, attempt to initiate contact with new arrival. Use the guide below to help you.				
If a phone number is included in the packet					
	Call 1 - Date:	Time:			
	Contact made	Set date for skin test and/or clinic appt			
	Message	If no callback - proceed to Call 2 within			
	No Answer	Proceed to Call 2 within 7 days	ar r days		
	Incorrect#	Send Letter (below)			
Call 2 – Date:		Time:			
	Contact made	Set date for skin test and/or clinic appt	- 7 3		
	Message	If no callback - proceed to Call 3 with	n / days		
	No Answer Incorrect#	Proceed to Call 3 within 7 days			
	Call 3 – Date:	Send Letter (below) Time:			
	The state of the s				
	Contact made	Set date for skin test and/or clinic appt.			
	Message	Send Letter (below)			
	No Answer	Send Letter (below)			
	Incorrect#	Send Letter (below)			
Lj	no working phone numbe	r, or the new arrival does not respond after	three attempts by phone		
	Date sent:	on including Nurse's name, phone numbe	r and brief explanation of process.		
	Contact made	Set date for skin test and/or clinic appt			
	No response		it within 14 days. If not, fax checklist and		
	Completed TB Follow-up Worksheet to TB Division within 24 hours If resources allow and no response by any other method, visit new arrival's home in person Visited new arrival at address provided in Class AB packet. Date:				
	Contact made	Set date for skin test and/or clinic appt.			
	No one home Repeat if resources permit, otherwise fax checklist and completed up Worksheet to TB Division within 24 hours		e fax checklist and completed TB Follow-		
	Incorrect address	Fax checklist and TB Follow-up Wor	ksheet to TB Division within 24 hours		
	If contact is m	ade with the new arrival during any of the			
	TST or IGRA Planted/Re (if required)	ad Date Read:	Result: Positive / Negative		
	Clinic appointment Scheduled	Write Appointment date, time and clinic in box on right. Fax a copy of	Appointment Date:		
		this checklist to the TB Division	Clinic:		
	New arrival refused care	Fax a copy of this checklist and the c the TB Division within 24 hours	ompleted TB Follow-up Worksheet to		
		If the new arrival agrees to go to clinic			
-	Client does not show up t appointment	Reschedule appointment. If client continues non-compliance, fill out the TB Follow-up Worksheet and fax to the TB Division within 24 hours			
	Client does not accept	Within 24 hours of receiving the TB clinic form from the clinic fill out and			
	treatment for TB infection	fax the TB Follow-up Worksheet to t	fax the TB Follow-up Worksheet to the TB Division		
	Client starts treatment	Monitor adherence for duration of therapy			
Client completes treatment		Within 24 hours of notification from the clinic that the new arrival has completed therapy, fill out and fax the TB Follow-up Worksheet to the TB Division			
Client begins but does not complete treatment			Within 24 hours of learning that the patient stops treatment and refuses to restart, fill out and fax the TB Follow-up Worksheet to the TB Division		
Form revised on 2-21-					

Additional Resources

MAVEN Help

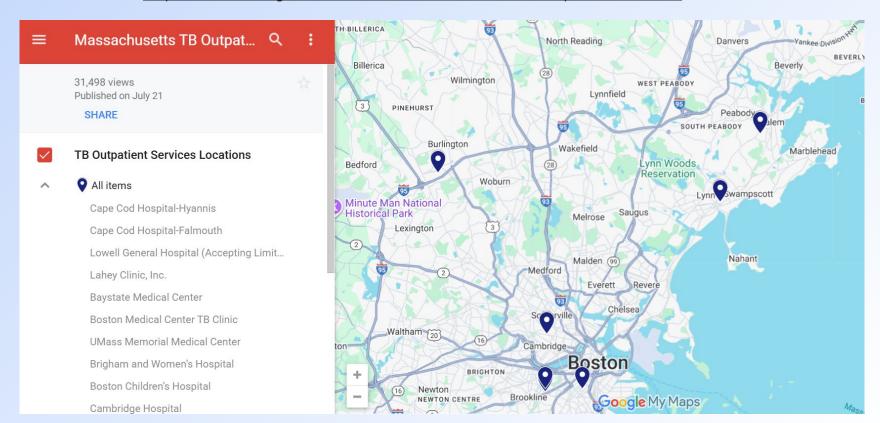
Can be found at: https://www.maven-help.maventrainingsite.com/



Additional Resources

TB Outpatient Clinics

Can be found at: https://www.mass.gov/info-details/massachusetts-tb-outpatient-services



Questions?

Contact us!

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Mystic Valley Public Health Coalition

Laura Nash, MPH: <u>LNash@Salem.com</u>

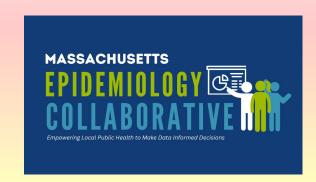
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Resources







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