California Tuberculosis Elimination Plan

2021-2025

A FIVE-YEAR ACTION PLAN

AUGUST 2021

California Tuberculosis Elimination Advisory Committee

UCSF
University of California
San Francisco

CTEAC
California Tuberculosis Elimination
Advisory Committee

CDPH
California Department of
PublicHealth

California Tuberculosis Elimination Plan

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AUGUST 2021

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One Californian's perspective on TB prevention:

"…latent TB infection is treatable…you've got thousands and thousands and thousands of people walking around with LTBI…it's a little bit of a time bomb…In the United States, we have the luxury of being able to get tested, being able to get treated for LTBI and…stopping the spread of a disease in its tracks. And in a very small way, I'm really proud to be a part of that and help stop that spread…."

— ZACK,* a contact exposed to TB (San Francisco, 2019)

*A video of TB patient Kristen V. and her husband Zack can be found at:
https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/TB_Community_Resources.aspx

Preface

This Tuberculosis Elimination Plan is dedicated to the 1.5 million people who die from tuberculosis each year worldwide, including those in California. Tuberculosis is a preventable disease. This Plan was developed to create a future without tuberculosis disease and death.

Acknowledgements

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Executive Summary

The California TB Elimination Advisory Committee (CTEAC), in collaboration with the California Department of Public Health (CDPH), developed the nation's first statewide Tuberculosis (TB) Elimination Plan in 2016. It was an opportune time for California to intensify its efforts to eliminate TB due to the declining number of TB cases in the state and the decrease in community transmission of TB. The purpose of the first Plan was to address the large pool of untreated latent TB infection (LTBI) strategically, which, in many persons, progresses to active and infectious TB disease.

California TB elimination targets:

- Pre-elimination by **2035**
- Elimination by **2050**

While California has made great strides in controlling TB in the last 30 years, disparities among populations have increased, especially among Asian and Pacific Islander populations. In 2020, the case rate among Asians born outside of the United States was 50 times higher than the case rate of U.S.-born Whites.[1] Additionally, as the average age of a person with TB has increased, TB treatment has become more challenging, due to co-morbidities more commonly found among older patients. TB persists as a deadly disease in California: 10% do not survive treatment and one in six die within five years of diagnosis.[2] Catastrophic costs occur for patients and families, and direct and societal costs in California were over $180 million in 2020.[3]

The CTEAC membership includes TB controllers, medical and public health experts, academic partners and TB survivors. In December 2020, CTEAC members and partners met to update the statewide 2016-2020 TB Elimination Plan for 2021-2025. During the meeting, the progress made from the first Plan was reviewed. Meeting attendees then participated in a comprehensive review of the barriers to elimination and proposed Plan action steps for 2021-2025. The barriers which challenge TB prevention addressed by this Plan include: 1) a lack of awareness and engagement among high risk populations and their providers; 2) patient and health system impediments to affordable TB prevention services; 3) the absence of a required performance measure for LTBI testing and treatment; 4) a

lack of electronic health record (EHR) and LTBI surveillance systems to support and track LTBI continuity of care; 5) the absence of continuous, dedicated resources to support TB prevention; and 6) limited TB prevention research.

Building upon the achievements of the first Plan, the California Tuberculosis Elimination Plan, 2021-2025, presents an action plan for the TB prevention and control community and its partners to move the TB elimination dial even further toward the state's goals. The new Plan presents bold TB elimination targets, including, by 2025, to: reduce the annual number of TB cases by 30% to 1,500; reduce TB disparities among non-U.S.-born Californians by 25%; and reduce annual TB deaths also by 25%, to 150. New targets for TB pre-elimination and elimination have also been set — to reach pre-elimination (400 cases/year) by 2035 and full elimination (40 cases/year) by 2050.

The Plan outlines actions for TB elimination to ensure the **>2 million Californians with LTBI** are detected and successfully treated, and future cases of active TB are prevented.

The updated Plan provides recommendations which focus on: 1) engaging populations at risk and their providers; 2) ensuring implementation of effective strategies for LTBI testing and treatment; 3) implementing a statewide LTBI surveillance system; 4) securing sufficient resources for Plan implementation; and 5) conducting research to evaluate TB prevention strategies. Each Plan recommendation is supported by new action steps which provide a roadmap for success. Compared to the status quo, if California reaches TB elimination by 2050, the state can avert 36,000 cases of TB disease and 3,600 TB deaths and save one billion dollars in medical costs and an additional one billion dollars in societal costs.

New areas of focus in the updated Plan include: new efforts to promote TB-related health equity; an intensified focus on outreach and education to high risk communities; educating providers about the importance of measuring the LTBI care cascade and supporting their efforts to do this work; using new LTBI reporting requirements to stimulate prevention efforts; promoting synergistic efforts across new local and state-level elimination plans; working with healthcare plans to promote the new U.S. Preventive

Services Task Force (USPSTF) recommendation for LTBI testing; establishing a research network focusing on LTBI; and facilitating opportunities to build on COVID-19 and TB synergies.

A multitude of partners is needed to successfully implement the Plan, including local TB programs; primary care providers and community health clinics (CHCs); public and private healthcare systems; community-based organizations; TB survivors; new funders; academic researchers; and others.

While there are challenges to reaching elimination which are further complicated by the COVID-19 pandemic, many opportunities exist to make progress on TB elimination, including: 1) the ability to focus on TB prevention due to a nadir in TB transmission; 2) research demonstrating that LTBI testing and treatment of high risk populations is cost-effective; 3) new tools for LTBI testing and treatment scale-up; 4) new LTBI surveillance reporting streams; and 5) the ability to address the potential synergies of COVID-19 and TB disease prevention. In addition, at the national level, the USPSTF now recommends testing of all non-U.S.-born persons for LTBI and CDC has launched a national TB prevention and elimination campaign.

Ongoing monitoring and evaluation of this Plan is paramount to its success. The evaluation plan includes a logic model which communicates the overall evaluation strategy and detailed measurements to assess the Plan's implementation. Specific outcomes targeted for 2025 include: 1) an increase in both LTBI testing and treatment completion to 80% and 77%, respectively; 2) a reduction in annual case numbers (1,500 cases/year); 3) a reduction in the non-U.S.-born TB case rate by at least 25%; and 4) reduced TB deaths (150/year).

Below are the 40 action steps (abbreviated) for the California TB Elimination Plan, 2021-2025, recommended by CTEAC members and stakeholders to overcome the obstacles that challenge effective implementation of TB prevention activities. Annually, CTEAC members and partners will monitor the implementation of the Plan with the intent to achieve the targets presented for 2025.

California Tuberculosis Elimination Plan
A Five-Year Action Plan, 2021-2025

RECOMMENDATION 1

Find and engage persons at high risk and their providers

1. Conduct outreach and education to engage priority primary care providers in TB prevention activities
2. Engage primary care medical organizations to message the value of TB prevention to their memberships
3. Implement "California TB Hero" program to recognize providers and organization leaders excelling in LTBI testing and treatment
4. Increase LTBI testing and treatment in healthcare settings focused on health equity and hepatitis B initiatives serving Asian American, Native Hawaiian and Pacific Islander (AANHPI) populations
5. Implement a curriculum to train non-licensed health workers in community health clinics to message TB prevention and link high risk individuals in AANHPI and Latinx communities to care
6. Use CDC's LTBI communications research findings to tailor messages
7. Integrate TB prevention messages into California Department of Public Health education materials/campaigns for diabetes, tobacco, HIV and other chronic diseases
8. Support TB survivors' efforts to increase TB prevention awareness in California
9. Implement TB prevention public awareness campaigns for AANHPI and Latinx populations
10. Post the most effective patient education materials on public websites

RECOMMENDATION 2

Apply effective strategies for LTBI testing and treatment

1. Publish a TB prevention "playbook" for clinics/health systems serving high risk populations
2. Partner with clinics serving high risk populations to measure and improve their LTBI care cascades
3. Disseminate steps for linkage to care for LTBI treatment for immigration status adjustors to civil surgeons
4. Implement interventions to improve LTBI treatment outcomes for groups already systematically tested
5. Couple LTBI testing, referral and care linkage into COVID-19 testing/vaccine outreach efforts
6. Provide technical assistance to Medi-Cal Managed Care plan leaders to implement LTBI testing and treatment quality improvement projects
7. Encourage Medi-Cal Managed Care plan leaders to seek awards for their LTBI testing and treatment quality improvement projects

RECOMMENDATION 3

Develop a California LTBI surveillance system

1. Publish an annual California LTBI report describing LTBI testing and treatment outcomes for high risk California populations
2. Map TB and COVID-19 case overlap to identify hardest hit communities for outreach and testing
3. Establish statewide LTBI measures and submit measures to the National Quality Forum (NQF) for endorsement and to the Centers for Medicare & Medicaid Services (CMS) Adult and Child Core Set Workgroup for addition to the Child and Adult Care Measure Set

4. Update report on treatment completion rates for Medi-Cal participants with LTBI
5. Implement a statewide surveillance system to track data on individual contacts to TB cases
6. Enhance electronic laboratory reporting (ELR) of interferon-gamma release assay (IGRA) results to capture individual risk information and negative IGRA results
7. Create routine transfer of EHR data to the California Department of Public Health and local health departments from healthcare entities to measure the TB prevention cascade
8. Promote routine measurement of LTBI testing and treatment in the Association of Asian Pacific Community Health Organizations (AAPCHO) clinic network
9. Outreach to health system quality assurance managers to measure United States Preventive Services Task Force-recommended LTBI testing

RECOMMENDATION 4

Secure sufficient resources for Plan implementation

1. Define the resources needed for successful implementation of the 2021-2025 California TB Elimination Plan
2. Develop a "business case" that describes the compelling human and economic benefit of preventing TB
3. Expand California TB coalitions to include representatives of populations most affected by TB
4. Ensure synergistic efforts and coordination across the four California TB elimination plans
5. Secure funding to support key TB prevention and elimination efforts
6. Establish routine monitoring of rifamycin inventory and price for early warning of drug supply disruptions

7. Ensure rifamycin LTBI medications are on the Medi-Cal pharmacy benefit program's formulary
8. Ensure cost coverage of IGRAs by California health plans, including Medi-Cal Managed Care, Covered California and private plans
9. Reduce cost-sharing of IGRA testing and LTBI treatment for healthcare systems

RECOMMENDATION 5

Conduct research to evaluate TB prevention strategies

1. Establish a research network focused on LTBI in California
2. Use TB elimination modeling to establish targets for case reduction, disparity reduction and TB pre-elimination
3. Promote research on implementation of new LTBI diagnostics and treatment in California
4. Conduct research on effectiveness and cost-effectiveness of strategies to reduce LTBI care cascade attrition
5. Analyze health system and pharmaceutical data sets to provide current information on LTBI testing and treatment practices in California healthcare settings

Background

The California TB Elimination Plan, 2016-2020

In 2015, the California TB Elimination Advisory Committee (CTEAC) convened to develop a five-year TB elimination plan for California. Since TB disease was at a nadir and community transmission of TB was limited, the purpose was to address strategically the large pool of untreated LTBI, which remains the main driver of TB disease in California. The 2016-2020 California TB Elimination Plan (https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/TBCB-TB-Elimination-Plan-2016-2020.pdf) stimulated a multitude of efforts that led to an ongoing bold movement towards achieving TB elimination.

> Improving healthcare outcomes for California's most vulnerable populations is a prerequisite of TB elimination.

The primary strategy of the state's first TB Elimination Plan was to intensify targeted testing and treatment of LTBI while simultaneously controlling TB disease, as the core functions of TB control must be maintained while TB prevention activities expand to hasten progress towards elimination. To intensify TB prevention, the Plan outlined 68 action steps to: 1) identify and engage persons and populations at high risk for TB, and the providers who serve them; 2) apply focused and effective strategies for TB testing and optimization of LTBI treatment; 3) develop and maintain strong and effective partnerships with elimination stakeholders; 4) create effective communication strategies to promote TB prevention to both providers and high risk populations; 5) improve LTBI surveillance; and 6) secure sufficient resources for implementing the Plan.

During the 2016-2020 timeframe of the first Plan, leaders and partners participating in California's TB elimination efforts made incredible progress across all of the Plan's recommendations outlined above. Highlights of successes include the development and adoption of TB risk assessment tools and a documented increase in the use of IGRAs — a more effective LTBI diagnostic test than the traditionally used TB skin test. Progress in treating persons with LTBI with the recommended short-course LTBI regi-

mens also occurred, and the majority of Medi-Cal Managed Care plans in California now cover rifapentine on their formularies. Advances with LTBI surveillance have been made as well, as positive IGRA results became reportable in California in 2018. Scale-up of TB prevention in primary care settings occurred with seven clinical sites in California measuring their LTBI care cascades. New grants of limited size have enabled increased community engagement with high risk populations and have contributed to the start-up of local TB coalitions.

Underpinning the successes of the last five years is the CDPH TB Free California project, the only statewide program with dedicated funding for TB prevention. The program's goal is to increase testing and treatment of LTBI in order to prevent cases of TB disease. TB Free California works to train healthcare providers who serve high risk populations to measure LTBI testing and treatment completion in community clinical settings and provides patient education and engagement of populations at highest risk of LTBI. In addition, the project contributes to state and national efforts to build data systems that measure LTBI care. This work aligns with the CDPH Strategic Map and Public Health 2035, strengthening infrastructure for a foundational public health service and promoting health equity through disease prevention. Since the project's inception in 2017, TB Free California staff estimate that the clinics they have worked with have screened more than 29,000 individuals for TB risk factors and have tested more than 7,500 high risk patients for TB. Quality improvement projects with the clinics TB Free California staff have worked with have shown a 50-100% increase in LTBI treatment completion.

Collectively, the efforts of TB Free California and other successes achieved in 2016-2020 mentioned above, in addition to many others, have successfully laid the groundwork for creating meaningful change, i.e., translating to TB case decline during the next five years. For a more detailed overview of progress made during 2016-2020, see Appendix C.

Despite the multitude of successes, many challenges for optimizing TB prevention still loom, including those presented by the COVID-19 pandemic which startled the nation in early 2020. To tackle these challenges, in December 2020, CTEAC members, liaisons and stakeholders met to

review the evidence for proposed strategies and action steps for an updated California TB Elimination Plan for 2021-2025.

The role of the CTEAC body, which is comprised of TB controllers, medical and public health experts, community-based organization representatives, TB survivors and researchers, is to review the evidence-bases for TB elimination strategies and to monitor the implementation of the statewide Plan. The Committee was expanded to include new members and stakeholders before updating the Plan for 2021-2025.

The absence of dedicated resources to support TB prevention is a major impediment to making substantial progress on TB elimination in California.

The first Plan's framework and action steps were modified to address the current impediments to making substantial progress in meeting the state's TB elimination targets. As an example, the absence of dedicated resources to support TB prevention is an impediment to making substantial progress on TB elimination in California. TB control programs have been unable to fully give TB prevention the priority it deserves given sparse funding and ongoing complex TB disease management challenges.

Another impediment to elimination is the lack of a requirement in California for providers or clinics to measure LTBI testing and treatment – which has the potential to change healthcare practice expeditiously. Furthermore, a systematic TB prevention approach is stymied by multiple independent EHR systems operating without interconnection to each other and without being accessible to public health agencies. This results in the need for extraordinary efforts statewide to achieve a simple goal of effective LTBI surveillance and measurement of the LTBI care cascade.

In addition to these broader barriers, impediments exist at the patient and provider levels. One impediment is the cost of IGRAs to individual patients who lack health insurance (or are underinsured) as well as healthcare plans and systems that are reluctant to assume the costs of these more expensive LTBI tests, despite their greater efficacy. Additionally, many community providers (e.g., providers in private practice groups, health maintenance organizations, community clinics) lack basic knowledge about TB

prevention while others lack the bandwidth to provide education about LTBI treatment to their patients. Furthermore, few provider groups have the processes in place to ensure their patients with LTBI are linked to care through treatment completion. Lastly, TB prevention research needs to be increased to identify the most effective interventions.

The COVID-19 pandemic provides both challenges and opportunities for TB elimination in California. While the decline in TB case numbers in California was largely stagnant in recent years, in 2020 the TB case count decreased dramatically — more than 19%. This was the largest drop in an annual TB case count since 1981. It is likely that at least some of the decrease is related to the COVID-19 pandemic. The specific causes of this single year decline may not be known for some time. However, likely contributing factors include missing TB cases from: decreased detection of TB due to fewer patients seeking care or fewer TB diagnoses made when they sought care; decreased immigration because of travel restrictions or economic conditions; or decreased transmission of TB because of interventions to decrease COVID-19 spread, such as masking and reduced movement outside of households, as has been noted for influenza. It is expected there may be a rebound of TB disease in the near term when these conditions resolve, which will need to be tackled as TB prevention efforts expand.

Purpose

The California TB Elimination Plan, 2021-2025, represents an update to the state's first Plan (2016-2020). Its purpose is to outline actions that can be taken to ensure that the more than two million Californians with LTBI are diagnosed and successfully treated in order to prevent future cases of active TB as well as to accelerate the time to TB elimination in the state.

In order to truly make progress on TB elimination, substantial investments in targeted LTBI testing and treatment must be made. One TB elimination model demonstrated that TB cases would decrease only 1.3% per year if prevention and control activities continued at the same pace as in 2019.[4] Intensifying targeted testing and treatment of LTBI must occur in parallel to ongoing TB disease detection and treatment efforts. It is critical that the detection of TB disease be timely, that treatment be effective and that thorough contact investigations are completed. It is only with well-resourced and competent health departments that the core functions of TB control can be maintained while TB prevention activities expand to hasten progress towards elimination.

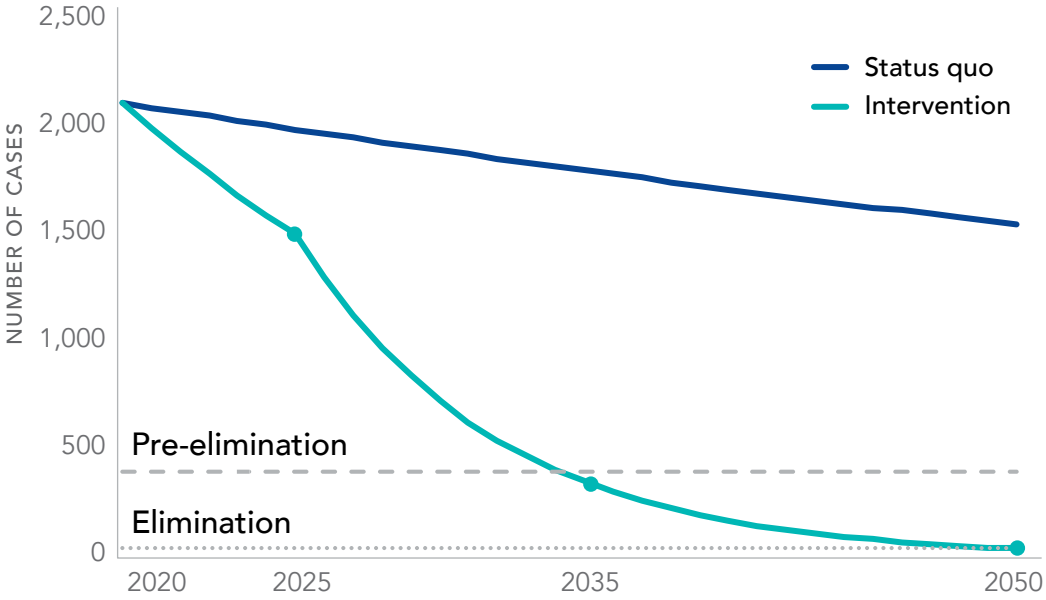
The overall human and economic consequences of persistent TB disease in California are the most compelling reasons to pursue elimination.

There are several compelling reasons to intensify efforts to eliminate TB in California. The fact that the state has experienced a substantial decline in TB cases and TB mortality since the height of the TB resurgence in the 1980s and early 1990s is just one. Epidemiologic evidence suggests that recent transmission of TB is at a nadir and that the percentage of TB contributed by recent arrivers has declined by 50% since overseas TB screening and treatment were improved in 2007.[5] This significant improvement, in addition to better LTBI tests and new short-course treatments (and other TB elimination successes since 2016), creates new opportunities to prevent TB by focusing on reducing the size of the LTBI reservoir in California.

Compared to the status quo, if California reaches TB elimination by 2050, the state can avert 36,000 cases of TB disease and 3,600 deaths with TB, and save one billion dollars in medical costs and an additional one billion dollars in societal costs.

Finally, there are new nationwide efforts that are supporting TB elimination. CDC is actively pursuing a TB elimination campaign and, as of 2020, is requiring states and cities that receive federal funding for TB prevention and control to develop elimination plans for their respective jurisdictions.

Targets for California TB Elimination Plan, 2021-2025 — Status quo versus intervention



Further rationale that the time is right for California to focus on TB elimination is the substantial evidence that TB prevention is cost-effective.[6,7] It is much less costly to test and treat an individual with LTBI than for TB disease. The cost to prevent TB for one person is minimal ($790) compared to the cost of diagnosing and treating one person with active TB disease ($43,900).[8] From a population perspective, studies have revealed the cost-effectiveness of testing non-U.S.-born individuals and treating those who have LTBI.[9] One study found that targeted testing with IGRAs and short-course treatment for LTBI among non-U.S.-born persons, both

with and without comorbidities, are both effective as well as cost-effective.[10] Perhaps most importantly, the overall human and economic consequences of persistent TB disease in California are the most compelling reasons to pursue elimination. If not prevented, TB disease can result in hospitalization, disability and most critically, premature death. For example, half of individuals diagnosed with TB are hospitalized for treatment or disease complications; these hospitalizations are twice as expensive and four times longer than hospitalizations for other conditions.[11] Individuals' inability to work and loss of income due to TB disease affect their families and leads to an overall depreciation in their quality of life.

The cost to prevent TB for one person is minimal **($790)** compared to the cost of diagnosing and treating one person with active TB disease **($43,900)**.

Furthermore, the TB death toll is daunting[12]: in California, one in 10 diagnosed with TB disease dies, either during therapy or before treatment[2]; one in six dies of TB within five years of diagnosis. If trends in case burden continue, by 2050 there will have been approximately 5,600 deaths with TB in California.

TB has tragic consequences[2,13-17]

Death

- 1 in 6 die within five years of diagnosis
- 10% do not survive treatment

Disability

- After treatment, impaired lung function and shorter life expectancy
- >80% of children with CNS TB die or permanently disabled

Hospitalization

- 2x expensive and 4x longer than hospitalizations for other conditions

Cost

- Catastrophic costs to patients and families
- >$180 million in direct and societal costs in California in 2020

Since 2016, there are additional opportunities for scaling up TB prevention efforts. These include: COVID-19 response innovations which can advance outreach, testing capacity and facilitate an important disparity focus for TB prevention; and research findings from CDC's TB Epidemiologic Studies Consortium (TBESC) which provide evidence and new strategies for changing practice. In addition to this updated Elimination Plan, new plans from three California cities with high TB morbidity — Los Angeles, San Diego and San Francisco — will help to focus synergistic efforts to reach California's TB elimination targets.

TB elimination in California

The World Health Organization defines TB elimination as <1 case of TB disease/million, which translates to an elimination target of 40 cases per year in California. In 2019, 2,115 TB cases were reported in California. While TB control efforts successfully reduced TB disease to below the epidemic threshold of <100 cases/million in 2000, the current case count is still five times higher than the pre-elimination target and 50 times higher than the elimination target. To reach pre-elimination in the state by 2035 (400 cases), a 10% annual decline in TB cases must occur. The 2021-2025 Elimination Plan sets new TB disease targets for the next five years and beyond, as shown in the following tables.

Targets for California TB Elimination Plan, 2021-2025 — TB disease, disparities and death

OUTCOMES	CURRENT STATUS (2019)		TARGETS		
	CASES	RATE	CASES	RATE	YEAR
Reduce TB cases by at least 30%	**2,115**	**53**/million	**1,500**	**38**/million	2025
Reduce TB disparities — reduce non-U.S.-born case rate by at least 25%	**1,772**	**163**/million	**1,222**	**116**/million	2025
Reduce TB deaths by at least 25%	**200**	**5.3**/million	**150**	**3.8**/million	2025

Pre-elimination and elimination

OUTCOMES	TARGETS		
	CASES	RATE	YEAR
Pre-elimination	**400**	**<10**/million	2035
Elimination	**40**	**<1**/million	2050

To create a TB-free California in the near future, strategic thinking and bold actions are needed. As an example, to reach these targets, two million non-U.S.-born persons will need to be tested for LTBI annually. The Plan's action steps provide a roadmap for achieving these metrics.

The faces of TB in California

In recent years, the TB public health community has endeavored to bring the faces of TB to the forefront. Each case of TB represents an individual, along with each of their families and larger communities, who has suffered from TB, a preventable disease. Until recently, these persons have remained largely invisible, yet we know that clinical and public health providers can learn a lot from those who have experienced TB first-hand. Patient advocacy organizations such as "We are TB" provide peer support to TB patients and also serve as advocates for TB diagnostics, treatment and funding. These advocates have been through the wear and tear of long treatments for TB and can share their insights with providers and public health experts to facilitate improvements in healthcare delivery. Furthermore, TB survivors can serve as invaluable supporters and champions for current TB patients going through TB treatment.

TB kills and disables Californians every year, and stark disparities persist.

We can prevent TB and its consequences.

TB survivors are also the TB community's most powerful messengers. Their unique perspectives contribute to crafting effective prevention messaging for high risk populations. They can provide heartfelt persuasion to encourage those with LTBI to accept treatment to prevent their infection from becoming active and spreading. A great example is Khayr, a TB survivor, who shares a piece of his story[18]:

> *"If I had been sat down when I was 19 and told, 'hey, you have latent TB, and if you don't finish your treatment, it can develop into dangerous TB disease,' I would have done so. It would have saved me a lot of grief in the future. It would have saved me seven months in isolation. So I think stopping TB at that initial stage, when it's latent, and when you're not infectious, I think is something that we need to educate more people about."*

In California, a number of efforts are underway to engage TB survivors to speak out about their experiences. So far, at least one local TB elimination coalition has a number of TB patient advocates who are active in the group. The TB community can benefit from providing opportunities for these advocates to share their experiences.

Intended audience

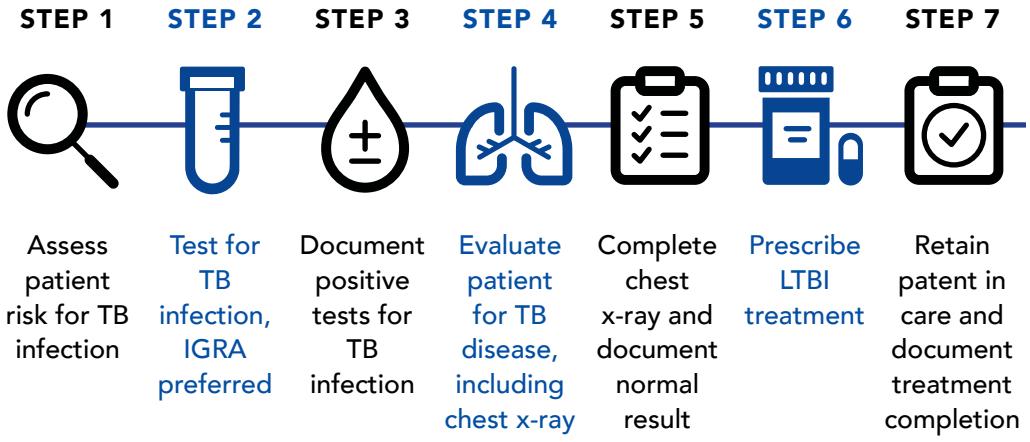
The audiences of the California TB Elimination Plan, 2021-2025 are public health practitioners; community providers; health plan leaders; policymakers; community organizations and TB coalitions; and other partners in the public and private sectors who serve populations at risk for TB. Ultimately, the Plan is intended to benefit all Californians as efforts to make California TB-free will be of benefit to all of the state's residents. The Plan will be used by CTEAC and its partners to monitor and advance progress on TB elimination and identify and overcome barriers to successful implementation.

Key concepts

TB prevention. While many activities are needed to control and reduce the number of TB cases in California, the term "TB prevention," as used in this report, specifically refers to targeted testing and treatment of LTBI. The term can also be used to describe other activities that contribute to TB disease prevention (e.g., early detection and treatment of TB, isolation of patients with infectious TB, contact investigation, bacille Calmette–Guérin (BCG) vaccination and environmental controls for preventing transmission of *Mycobacterium TB*). "TB prevention" in this Plan primarily refers to preventing LTBI from reactivating and developing into infectious TB disease.

LTBI care cascade. The care cascade outlines the steps from initial TB screening through LTBI treatment. The purpose of measuring each step of the care cascade is to assess the number of patients who are lost at each stage of the cascade so interventions can be implemented to limit attrition and ensure the completion of LTBI treatment, the final step of the cascade. Supporting best practices for these efforts is integral to continuity of care, which ultimately promotes TB elimination.

LTBI care cascade



Geographic focus of the Plan. This Plan describes strategic actions that TB elimination stakeholders can implement in California. While national and international policies and activities strongly influence TB disease trends in the state, the primary focus of this Plan is what can be accomplished in California within a five-year period.

Innovations and research. Many recent advances and innovations, such as LTBI diagnostic and treatment regimens and technologies, are central to this Plan. It is understood that new and ongoing research is needed to improve current methods for LTBI testing, treatment and surveillance, among other areas. Because ongoing research is crucial, this updated Plan includes a new recommendation with correlating action steps for conducting research to evaluate TB prevention strategies.

Collaboration with local TB programs with TB elimination plans

With the intent to coordinate TB elimination efforts throughout the state, CDPH TB Control Branch leadership regularly meets with leaders from the three local health departments that are directly-funded by CDC's Division of TB Elimination. As of 2020, each of these jurisdictions (Los Angeles, San Diego and San Francisco) was required to develop and implement a TB elimination plan. Regular meetings and coordination across efforts during this five-year period will reduce duplication of effort and identify best practices.

Epidemiology of Tuberculosis in California

TB is a communicable disease that is caused by the bacterium *Mycobacterium tuberculosis* (*M. tuberculosis*). When a person becomes infected with *M. tuberculosis*, the bacteria are usually contained by the immune system and remain dormant in the lungs; this condition is called LTBI. Approximately one-third of the world's population has LTBI. This condition is not infectious, nor does it create any symptoms unless it progresses. Most people do not even know that they have LTBI. In approximately five to 10% of people with LTBI, the TB infection will progress. In these people the TB bacteria will multiply and spread inside their bodies, creating an infectious form of the condition, referred to as "TB disease" or "active disease," which usually creates symptoms in the person. If left untreated, TB disease is life-threatening and remains the leading cause of global death from a bacterial agent.[19] While LTBI is common worldwide, and TB disease may be deadly, treatment for both LTBI and TB is available. LTBI can be treated so it does not progress to TB disease, and TB can be treated so the patient is cured and is no longer infectious or symptomatic. Tools for diagnosis and treatment are available, yet many barriers to identifying and treating both conditions exist. In California, these barriers include limited experience in the diagnosis and treatment of LTBI and TB disease among most healthcare providers.

More than two million Californians are infected with TB, and most are unaware of their infection and have not been treated.

California TB and LTBI risk profile

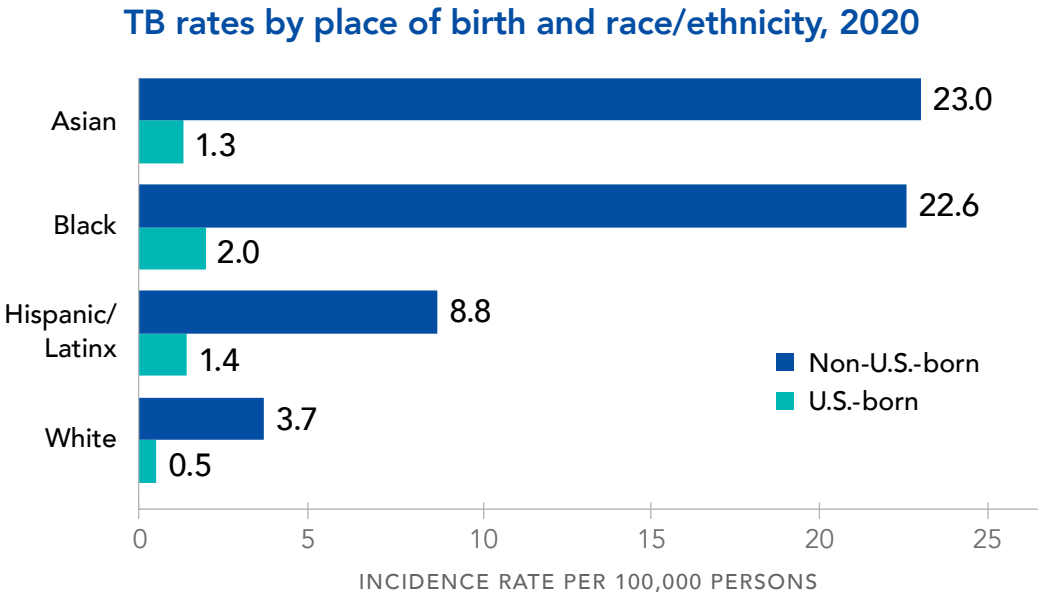
California is home to a large, diverse population that represents the highly mobile global community. Ten million individuals, or 27% of California's population of 39 million, were born outside the U.S., many from regions with an elevated TB burden.[20] Additionally, over 11 million individuals enter California from outside the U.S. each year. An example of this diversity is that 50% of California's 10 million children under age 18 have a non-U.S.-born parent.[21] Adding to this population with potential exposure to TB

earlier in their lives is the large and growing elderly population comprised of two million residents who are 75 years old or older.[22] Many U.S.-born and non-U.S.-born individuals exposed to TB in childhood have chronic medical conditions that increase their risk of progressing to TB disease. Overall, more than two million California residents are estimated to have LTBI; approximately 90% of them were born outside the U.S.[23]

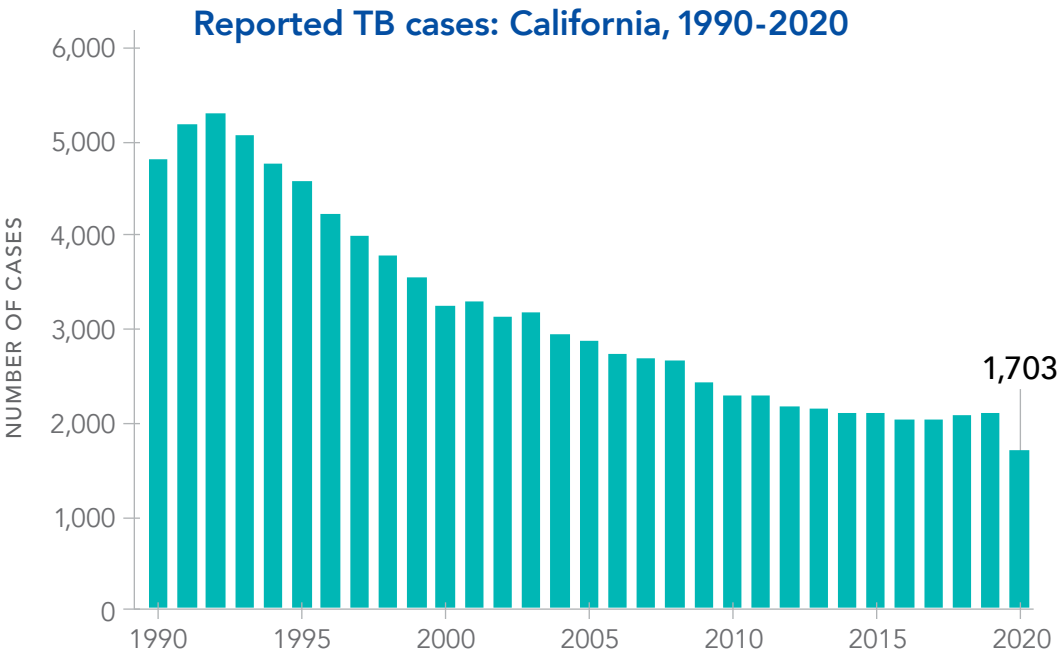
TB trends and patient characteristics through 2020

TB case numbers in California have declined by 60% since the peak of the recent epidemic in 1992, and the case rate has declined by 70%. However, other than the substantial drop in case numbers in 2020 previously discussed, since 2014, case numbers have largely been at a standstill; and TB disparities among different populations have not only persisted, but increased. In 2020, Asians born outside of the U.S. were diagnosed with TB at 50 times the rate of U.S.-born Whites, which far outstrips disparities by race/ethnicity noted in HIV, heart disease and diabetes.[24-26] Similarly, the TB case rates among non-U.S.-born Blacks and Hispanics were 51 and 20 times higher, respectively, than of U.S.-born Whites.

TB is >40x higher in non-U.S.-born Asian and Black communities than in U.S.-born White communities.



The halt in TB disease decline has a number of contributing factors. During the recent period of economic health and employment (before the onset of the COVID-19 pandemic), migration into California increased and migration out of California decreased. While adoption of innovations in LTBI testing and treatment of LTBI has advanced, the scale of prevention efforts needed has not been achieved. In addition, the TB disease that has been averted by LTBI testing and treatment takes time to show up as a case count drop as it is preventing disease that would otherwise occur in the future. The graph below illustrates the decline of TB disease in recent years.



The disease disparities previously noted reflect the diverse countries of origin of California's TB cases as key population changes occurred in California from 2014-2020. The Asian population has increased at a greater rate than other racial and ethnic groups. Among persons age 65 and older, population numbers of non-U.S.-born Asians increased by approximately 24% from 2014-2019, as did elderly, non-U.S.-born Latinx. Elderly persons born outside the U.S. with LTBI are at a high risk of progression to active TB and the racial and ethnic disparities in TB among population groups reflect this growing population.

The top five non-U.S. countries of origin for patients with TB disease in California have remained constant over the last 14 years, with Mexico,

the Philippines, Vietnam, China and India contributing 76% of California's non-U.S.-born-cases in 2019. The majority of these TB cases occur in those who have been in California for many years. At least half of all non-U.S.-born TB cases in California occurred more than 20 years after arrival in the U.S. Furthermore, nearly half of TB cases are among non-U.S.-born residents who enter the U.S. with immigrant or refugee status and are screened for TB disease (but not LTBI) before entering the U.S.

While disparities among different ethnic and racial groups have increased, the "face of TB" is also changing, as the average age of a person with TB has been increasing. In 2020, the median age of TB patients was 54 years, and approximately 40% of TB patients had at least one medical co-morbidity, such as diabetes mellitus, end-stage renal disease, anti-tumor-necrosis-factor therapy or other treatment with immunosuppressive drugs, solid organ transplantation, HIV infection or other immunosuppressive conditions.[1] These co-existing conditions increase the risk of progression to TB disease from asymptomatic and non-infectious LTBI. Finally, in California from 2015-2017, 10% of cases died with TB, a treatable — and preventable — disease.

During the past five years, there has been little change in how TB cases arise in California. More than 80% of TB disease in California result from progression of previously acquired infection (LTBI) to active disease. Another 12% is from recent transmission within California communities; and 8% is imported, i.e., from new arrivers who are diagnosed with TB disease within one year of arrival in the U.S. Finally, a very small percentage, less than 1% of TB disease, may be generated as a result of relapse of previously treated active disease or from re-infection.

The high cost of treating TB disease

- Hospitalizations are twice as expensive and four times longer than hospitalizations for other conditions[8]
- TB disease cost California more than $180 million dollars in 2020 (including the cost of premature death due to TB)[3]

With effective interventions, TB cases could decrease during the next decade. Much of the decrease will depend on the implementation of targeted testing and treatment of LTBI among long-standing residents and new migrants. Models of TB in California[27] estimate that one-time testing of 25% to 50% of the non-U.S.-born population would result in a substantial decline of TB cases. Testing among other populations at risk, such as persons with co-morbidities, will reduce new cases but alone cannot achieve TB elimination. It is important to note that despite the large scale of targeted testing and treatment necessary to achieve a substantial reduction in TB case burden, the approach is reasonably cost-effective in populations at risk. For example, targeted testing and treatment among non-U.S.-born persons is estimated to cost $82,486 per quality-adjusted life year (QALY).[28] Cost-effectiveness thresholds have been historically set at $50,000 per QALY, though $100,000 per QALY is also now routinely used.

Many of the populations most affected by TB are also affected by COVID-19. For example, most persons who had both TB and COVID-19 in 2020 were Latinx (58%) or Asian (34%), and 85% were born outside of the U.S.[1] — all of which demonstrate overlap of communities disproportionately affected by both COVID-19 and TB. The COVID-19 pandemic has highlighted the importance of place and health equity indices and has revealed the overlap of communities with high TB incidence and lower socioeconomic opportunity with COVID-19 and other health conditions. These California communities that experience many disease disparities are important areas for TB prevention focus.

In the fall of 2020, the California TB Control Branch performed a preliminary match of TB and COVID-19 registries and found high mortality among persons who had both recent or concurrent TB and COVID-19. This analysis also revealed the overlap in patient risks and communities affected by both respiratory diseases. Despite this tragedy, it also provides an opportunity for California's TB elimination leaders and partners.

Tuberculosis Control and Prevention in California

Each of California's 61 local health departments is responsible for overseeing the care of TB patients, responding to and preventing TB transmission in its community and preventing TB in individuals at high risk. Local health departments perform these functions through direct patient care and/or partnerships with community providers, including hospitals, health maintenance organizations, federally-qualified health centers (FQHCs) and other community clinics, private physician networks and individual providers.

Local TB control programs are supported by funding from federal, state and local governments. The percentage of each government's contribution varies for each local health department. Three large health departments in California — the counties of Los Angeles, San Diego and San Francisco — and the state TB control program, receive cooperative agreement funding from the CDC Division of TB Elimination. The majority of resources for TB control for local health departments come from their county level governments, which, during fiscal year 2019-2020, covered approximately 71% of TB program budgets. Medi-Cal, the Medicaid program in California, is also a key payer for healthcare for Californians with TB and LTBI.

The California TB Control Branch provides technical assistance, resources, outbreak assistance and consultation on diagnosis and management of drug resistant TB and guidance on TB prevention and control efforts. The program collects, interprets and disseminates surveillance data. Local health departments carry out TB prevention and control activities, including surveillance, epidemiology and direct services to individuals with, and at risk for, TB infection and disease within their geographic area. California's healthcare landscape is diverse, ranging from Kaiser Permanente, the largest of the primary care providers, to FQHCs, to community clinics and private, academic and hospital association clinics. These community and primary care providers have an essential role in the management of patients with both TB disease and LTBI.

Testing and treatment for LTBI

Since 2016, use of IGRAs for TB testing has expanded greatly. The IGRA is preferred over the TB skin test to diagnose LTBI because evidence demonstrates superior specificity, better performance in predicting TB disease and greater efficiency because it can be completed during a single visit.[29] Knowledge gaps and barriers, such as cost and phlebotomy access, however, need to be tackled for broader adoption among healthcare providers. In parallel, short-course LTBI regimens of three to four months have also increased in use, and in addition to trials demonstrating value over longer isoniazid (INH) therapy, modeling[4] and cost-effectiveness studies[10] have also been published that support their use. Based on current evidence and the USPSTF recommendation to screen asymptomatic adults at risk for LTBI, updated LTBI treatment guidelines from CDC[29] were published in February 2020, along with a number of practical tools that further support scale-up of LTBI testing and treatment.

TB screening programs in California are currently in place and cover an estimated 1.7 million individuals each year. The populations screened – which include teachers, employees and volunteers in schools; healthcare workers; and correctional inmates, parolees and employees – have varying risks of TB. Programs in place to screen populations at higher risk of TB include testing of individuals that are recent contacts to a known TB case; new immigrants arriving in the U.S. who had an abnormal chest radiograph during their overseas exam (B-notification arrivers); and individuals who apply to adjust their immigration status from a temporary to a permanent status (status adjusters).

For decades, many individuals tested each year in California had a low risk for TB, and many were re-tested annually without acquiring any new risk to justify repeat testing. Initial and re-testing of low risk populations use limited resources needed for effective TB prevention and control and can result in false-positive tests, unnecessary treatment and adverse treatment effects.

In 2016, the TB Control Branch, together with the California TB Controllers Association (CTCA) and the Curry International TB Center (CITC), produced a TB screening risk assessment tool to allow for risk screening of

individuals prior to actual TB testing. Different versions of this tool were developed for specific populations (e.g., adult, pediatric, school staff), and have been widely disseminated in both California and elsewhere in the U.S. Further adoption of these tools is needed and will likely occur as more widespread promotion of the USPSTF screening recommendation occurs, resulting in an increase in risk-based TB screening.

Ensuring that plan formularies include the **shortest, most effective LTBI treatment** regimens is an essential step for equitable access to TB prevention.

Increased use of and access to short-course LTBI treatment has also occurred since 2016, and rifapentine — a key ingredient in these treatment regimens — has been included in the formulary of 86% of Medi-Cal Managed Care plans as well as on the My Health LA pharmacy formulary. These interventions have reduced barriers for accessing short-course regimens and can help persons complete TB prevention therapy.

Despite the longstanding availability of treatment for LTBI and the newer treatment and testing methods, getting individuals through each step of testing and treatment for LTBI remains a challenge. California's local health departments and community provider partners perform testing and treatment for LTBI, but have had variable success in getting all patients at high risk through the full LTBI testing and treatment cascade. Without a vaccine, medication to treat LTBI remains the cornerstone of preventing TB disease.

A TB prevention care cascade (see figure on page 19) outlines the discrete steps needed to diagnose and treat people with LTBI. Treatment and prevention steps involve engaging and testing individuals with a high risk for TB, identifying individuals who should be tested for LTBI and starting and completing LTBI treatment in those individuals. At each step, patients and prevention opportunities can be lost, so "measuring" a clinic's care cascade allows effective interventions to be implemented to decrease patient attrition at each step. For example, only a small proportion of populations at high risk of LTBI receives a TB skin test or an IGRA. In California, in 2018, 77% of identified contacts to sputum smear-positive pulmonary TB cases were completely evaluated, but only 67% of those identified with LTBI started treatment, and only 58% of those who started actually finished

their full course of treatment. Rates of treatment completion have somewhat improved as more local health departments have adopted shorter treatment regimens (i.e., three- or four-month), but to make real progress with TB prevention, much higher completion rates must be achieved. Increasing success at each step of the cascade can have a substantial impact on California's ability to achieve TB elimination.

Especially needed is a performance quality measure related to LTBI care at the state or national level. The TB Control Branch has drafted two metrics and gathered supporting documentation for submission in 2023 to the Centers for Medicare & Medicaid Services (CMS) to apply for inclusion in the Adult and Child Core Set of quality measures. If approved, these metrics will be a powerful tool for increasing LTBI screening, testing and treatment among community providers in particular. Because the adoption of LTBI metrics at a national level is uncertain and timing is unknown, California will need to support statewide measures for primary care settings in order to realize the TB prevention improvements needed for populations at risk.

Healthcare services and payer sources

In California, healthcare services for TB are provided through a complex and variable healthcare delivery system, which can impede consistent LTBI testing and treatment activities. Among the 61 local health departments in California, just 21 reported 95% of all TB cases in California in 2010-2018. Nineteen of these 21 local health departments are able to provide direct patient care through county or local health system clinics or TB program-run health clinics; two have no county-affiliated TB clinics.[30] However, the proportion of patients cared for in a public health department has declined significantly in the past 10 years; just 49% of patients with TB disease in 2016-2018 received the majority of their TB care in a clinic associated with a public health department. Patients who do not receive their care in a public clinic receive care in the private sector or have care provided jointly by both community providers and a public health clinic. Across both private and public healthcare systems, providers' knowledge of TB varies, depending on the provider's level of experience and the prevalence of TB in each of their respective regions.

In 2016, the U.S. Preventive Services Task Force published a recommendation to primary care providers to screen non-U.S.-born asymptomatic adults for LTBI.

The federal Affordable Care Act, passed in 2010, provided new opportunities for health departments to provide TB prevention services. In 2014, Medi-Cal was expanded, and since then California has reduced its number of uninsured residents by more than 200%. In 2019, California further expanded Medi-Cal eligibility for undocumented immigrant adults under age 26. Safety net coverage for undocumented adults 26 and over remains scarce, although some counties offer their own plans for this population (e.g., Alameda Alliance for Health) or have policies to provide services regardless of immigration status in their respective county-funded clinics. Barriers to care still exist for many Californians who qualify for health insurance, either because they are not enrolled or because other health plans do not cover all TB services at no cost to the patient. California continues to be in a transition period of improving access to care for all and reducing health disparities.

In 2016, the USPSTF published a grade B recommendation for primary care providers to screen asymptomatic adults for LTBI in populations at increased risk. With this designation, patients cannot be required to pay out-of-pocket for LTBI testing, ensuring that all high risk individuals (with commercial insurance or who are eligible for Medi-Cal) are provided the first step in critical TB prevention care through public, individual and employer-provided health insurance plans.[29] However, a further barrier to TB treatment as prevention still remains, as many health insurance plans still do not categorize a chest x-ray and LTBI treatment as preventive services, so these crucial steps toward TB elimination may still incur costs for the patient.

In addition, some public health department-run clinics providing LTBI testing and treatment for contacts to TB cases that are referred to them but do not offer employment-related LTBI testing and treatment, routine risk assessments or targeted LTBI testing and treatment for their patient populations.

California's diverse groups of providers, including local public health departments, civil surgeon physicians, Medi-Cal providers, primary care providers (including FQHCs, Kaiser and others) and college/university health centers, are an important current and future source of TB prevention. The table below provides an overview of who is caring for TB patients in California (as of 2019).

Selected large volume providers of care for those at risk for TB (2019)

Local public health departments	• 12,000 contacts to TB patients • 7,000 immigrants and refugees • Many thousands receive TB prevention services at TB public health clinics
Civil surgeon physicians	• 100,000 immigration status adjustors
Medi-Cal providers	• 13.5 million Californians enrolled in Medi-Cal (approximately 1/3 of the state's population; exact number of enrollees at risk for TB is unknown)
Primary care providers	• >5 million Californians served by FQHCs • >9 million Californians served by Kaiser Permanente • >100,000 Californians served by other primary care providers
Providers at college/ university health centers	• 161,693 international students in California colleges/universities (2018-19 school year)

If a patient with TB meets specific income and other eligibility criteria, that patient can be enrolled in Medi-Cal, which covers TB diagnosis, treatment and case management expenses. Some local health departments can bill Medi-Cal for reimbursement.

Despite the expansion of Medi-Cal coverage and insurance not tied to employers, gaps in coverage remain for undocumented immigrants, many of whom are not eligible for Medi-Cal or for subsidies to purchase

health insurance plans through Covered California. Many undocumented immigrants and low-wage workers do not have employer-provided health plans, so they must rely on public or individually-purchased plans. This creates impediments for reaching this Plan's elimination targets, as up to 500,000 undocumented persons are estimated to have LTBI, and comprise roughly 15-25% of patients with TB disease in California.[10]

While there have been important advances in increasing access to TB prevention services since 2016, many challenges remain. In California's Medi-Cal Managed Care plans, LTBI testing using the TB skin test is covered, but as of 2018, not all plans cover IGRA testing without prior provider approval. These tests are the gold standard for testing non-U.S.-born high risk individuals who were vaccinated with BCG in their home countries. Moreover, if someone has a positive tuberculin skin test (TST) or IGRA, these plans do not automatically cover tests to rule out active TB (e.g., chest x-ray) and confirm the LTBI diagnosis; physician orders are required as next steps. Further still, if an individual is found to have LTBI, not all plans cover the newer short-course LTBI regimens without prior approval. Finally, even if health plans reimburse for all LTBI-related services, providers do not uniformly use IGRAs and short-course regimens, thus provider education and LTBI protocol development are needed.

As of 2021, IGRAs and short-course regimens are still not uniformly classified by health plans as preventive services because the specific services that fulfill the LTBI "preventive service" vary among the different plans. Not only do both chest x-rays and LTBI treatment require the extra step of physician orders, patients may be liable for co-pays, which vary depending on the type of plan.

Barriers to advancing TB prevention

- Limited awareness about TB prevention in affected communities
- Insufficient LTBI knowledge among healthcare providers
- Steps for healthcare access needed for those not in care
- Few streamlined paths in primary care to support patients through testing and treatment
- Electronic health record systems lack triggers and tracking options for TB prevention
- No required measure for LTBI testing/treatment in primary healthcare settings
- Cost barriers and lack of incentives for health systems and patients
- Limited resources focused on TB prevention
- Limited TB prevention research

Local health departments' capacities to perform TB prevention activities

Since the beginning of California's first TB Elimination Plan (2016), federal funding for TB has remained flat, despite increasing complexity of TB cases, increasing salaries and cost of living, and a stable number of cases in California. Of the 26 high and medium TB morbidity jurisdictions in California, only five jurisdictions reported an increase in funding in 2018 (one of which was one-time funding); the remaining 21 jurisdictions reported a decrease or no change in funding. These resource or funding gaps have led to negative impacts in local health departments' abilities to be able to provide core TB program functions including: contact investigation/B-notification (69% jurisdictions provide), case management (65%) and epidemiology/surveillance activities (69%). Unpublished 2018 data from the CDPH TB Program Assessment Tool (TPAT) shows six of the 26 high and medium burden jurisdictions reported a decrease in the number of TB-dedicated staff.

Despite this landscape, TB programs have utilized creative solutions in order to maintain core TB control responsibilities. Programs have increased adop-

tion of electronic directly-observed therapy; increased adoption of short-course LTBI treatment; created new community partnerships; regionalized TB laboratory services; and contracted services for TB clinical care.

Additional challenges facing local TB programs include loss of contracts with hotels providing housing for infectious/non-infectious TB patients and limited locations for the detention of persistently non-adherent TB patients. While the COVID-19 pandemic has created additional barriers to providing TB care (redirected public health staff to COVID-19 response efforts, challenges in providing field service and in-person clinical care, stigmatization of overlapping impacted populations and limited resources of personal protective equipment and hospital access), there are potential lessons learned that may impact future TB prevention and control activities.

In 2018, CDC introduced a federal mandate for civil surgeons to report LTBI in immigrants seeking status adjustment to local health departments. At least four California local health departments, building upon this required change in reporting, advocated for additional resources to focus on LTBI surveillance, civil surgeon outreach and linkage to care in order to ensure treatment of those who tested positive. However, much work remains to be done to uniformly link all persons with LTBI to treatment initiation and treatment. Ensuring this continuity of care is key to meeting the state's TB elimination targets.

The COVID-19 response brings important synergies in connecting patients to care and many repurposed TB tools that can increase TB prevention capacity in the state. One of the most important opportunities now available is human resources — California has leaders and champions committed to working to reach communities for preventive measures hit hard by both COVID-19 and TB. For example, in San Diego, the TB program identified hot spots where COVID-19 pop-up sites can be coupled with TB risk assessment, testing and linkage to treatment. This type of strategy could be extremely effective if utilized in other regions in the state. Additional prevention efforts that are outlined in three new TB local elimination plans (e.g., Los Angeles, San Diego and San Francisco plans) will allow for a well-coordinated effort and will promote collaboration and replication of TB prevention efforts.

Action Steps to Eliminate TB: 2021-2025

The framework for the 2021-2025 California TB Elimination Plan is based on the framework and recommendations of the state's first Plan (2016-2020). This updated Plan includes a new recommendation to: "conduct research to evaluate TB prevention strategies." Each recommendation is supported by a set of concrete action steps that designate specific actions, proposed lead organizations and partners and timelines with milestones. The action steps were developed to overcome the barriers that challenge TB prevention stakeholders. A logic model illustrating how Plan implementation will be evaluated can be found on page 60. The full evaluation is provided in Appendix E, and details specific objectives, performance measures and data sources.

Health equity statement

Improving the healthcare outcomes for California's most vulnerable populations is a prerequisite of TB elimination. The California TB Elimination Plan, 2021-2025, was developed with an emphasis on reducing health inequities in patient awareness, healthcare access and treatment outcomes in order to address the disproportionate impact of TB on non-U.S.-born persons.[1] To address TB in subgroups defined by race, ethnicity, nativity and socioeconomic status, the following recommendations and actions are set forth. CTEAC members and its partners believe the work towards equity of healthcare access and outcomes is the foundation for TB elimination in California.

RECOMMENDATION 1

Find and engage persons and populations at high risk for TB and their providers in California

Since 2016, both public health providers as well as a growing number of community providers have become more engaged in TB prevention activities and key health systems have taken steps to raise awareness about aspects of TB prevention. Successful collaborations have occurred to engage Medi-Cal Managed Care plan medical directors regarding the USPSTF recommendation to screen asymptomatic adults at risk for LTBI, and numerous new partnerships among local TB programs and community clinics have been developed. However, greater engagement among providers and health systems needs to occur, particularly in primary care settings, so LTBI care cascade outcomes can be measured and improved.

A first step to facilitating this effort is to overcome the barriers to physician and health system engagement, which include their lack of understanding and knowledge regarding TB prevention, particularly the value of prevention; the limited time providers have to spend with their patients; conflicting priorities; and the lack of visible leadership or "champions" for TB prevention.[31] In the last two years, the TB Control Branch identified the top primary care providers serving non-U.S.-born populations in California. Building on that work, the TB Control Branch plans to support local TB programs to conduct outreach to engage these providers in TB prevention activities.

In addition to providers and health systems, community engagement is key for success. For high risk populations, which are hard to reach and have fewer connections to healthcare, innovative strategies are needed to increase the engagement of these groups. Community engagement in TB prevention has occurred in a number of areas in the state, with San Diego, for example, leading a successful outreach effort in the Latinx population most hard hit by TB. Likewise, Los Angeles has seen success with a project that provides temporary housing to persons with LTBI and who are experiencing homelessness in order to facilitate completion of LTBI treatment. The TB program will soon be tracking the target population for those outcomes and is likely to show evidence of the project's success.

In addition to healthcare access barriers among communities at risk (e.g., transportation, language, cost-sharing for services), lack of awareness about LTBI is common, which creates an impediment to seeking TB prevention services. One barrier is the frequently held belief that the BCG vaccine creates immunity to TB.[32] Coupled with the stigma that exists with TB, creative strategies are needed to overcome these hurdles.

One of the primary components of the TB Control Branch's TB Free California initiative is to increase engagement among high risk populations. Staff have produced and disseminated culturally and linguistically competent TB prevention materials for use in diverse settings and new partnerships with community-based organizations and other state government programs have been established. The project's community outreach has focused on engagement efforts to decrease TB case disparities among AANHPI populations as well as among Latinx communities. As mentioned earlier, disparities have been consistently high for the last decade.

A primary strategy for successfully engaging providers, health systems and high risk communities in TB prevention activities is to strengthen existing partnerships as well as create and sustain new ones. Utilizing effective communication strategies is key to building these relationships.

Action steps for Recommendation 1 are outlined in the table below.

ACTION STEP	PROPOSED LEAD(S) AND PARTNER(S)
PROVIDER AND HEALTH SYSTEM ENGAGEMENT	
1. Conduct outreach and education to engage priority primary care providers in TB prevention activities	• **Local TB programs** • TB Control Branch
2. Engage primary care medical organizations to message the value of TB prevention (LTBI testing and treatment) to their memberships	• **CTCA** • TB Control Branch • Medical associations • TB coalitions • Local TB programs
3. Implement a visible "California TB Hero" program to recognize providers and organization leaders excelling in scale-up of LTBI testing and treatment	• **CTCA** • **Local TB programs** • TB Control Branch
4. Partner with healthcare organizations focused on health equity and hepatitis B initiatives serving Asian, Native Hawaiian and Pacific Islander populations to increase LTBI testing and treatment	• **TB Control Branch** • **Association of Asian Pacific Community Health Organizations (AAPCHO)** • **Local TB programs** • CDPH Hepatitis program • Hepatitis B Free Coalition
5. Implement a curriculum to train non-licensed health workers in CHCs to provide TB prevention messaging and linkage to care to high risk individuals in AANHPI and Latinx communities in areas with TB disparities	• **Curry International TB Center** • **AAPCHO** • **Latinx community-based organizations** • **Local TB coalitions** • Local TB programs • Federally-qualified health centers

TABLE CONTINUES >

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COMMUNITY ENGAGEMENT	
6. Use findings from CDC's LTBI Communications Campaign research to revise and tailor communication messages to high risk populations	• **State and local TB health educator workgroup** • **CTCA** • TB Control Branch
7. Integrate TB prevention messages into existing CDPH education materials and/or campaigns for diabetes, tobacco, HIV or other chronic diseases	• **TB Control Branch** • CDPH AIDS Office • CDPH Chronic Disease Control Branch • CDPH Tobacco Control Branch
8. Support TB survivors' efforts to increase TB prevention awareness in California	• **CTCA** • Statewide and local TB coalitions
9. Implement TB public awareness campaigns (in-language and culturally appropriate) for AANHPI and Latinx populations	• **AAPCHO** • **Latinx community health group, TBD** • Statewide and local TB coalitions • Hep B United Coalition • TB Control Branch
10. Identify the most effective patient education materials and make accessible on a public website for use by TB programs, primary care settings and patient advocates	• **CTCA** • Local TB programs • TB Control Branch

RECOMMENDATION 2

Apply focused and effective strategies for TB testing in California and optimize treatment for LTBI

As stated earlier, advances in LTBI testing and treatment have occurred in the last five years, with more use of IGRAs for testing high risk populations and a greater level of adoption of short-course regimens. Despite advances in LTBI testing and treatment, major barriers remain.

Required measures for latent TB testing and treatment are crucial to stimulate improvements in health systems.

A performance quality measure related to LTBI care that can be used at the state or national level is especially needed. If metrics are implemented, they will be a powerful tool for increasing LTBI screening, testing and treatment among community providers in particular.

Many of the opportunities for increasing LTBI testing and treatment among high risk populations exist within clinical settings. More education of providers about testing and treatment tools as well as increasing understanding about the LTBI care cascade steps are key to ensuring higher rates of LTBI testing and treatment completion. It will be important to develop new partnerships among health systems, community providers and health departments to increase the knowledge and skill base of providers. Opportunities exist for both state and local health departments to provide education, consultation and technical assistance to front-line providers.

The TB Control Branch is currently developing a TB prevention "playbook" which will serve as a guide for primary care clinics and health systems that want to improve their LTBI testing and treatment practices. It will provide a "how to" for establishing and improving a TB prevention program and will include strategies for overcoming barriers in each step of the LTBI care cascade. This tool will prove useful for engaged providers and healthcare systems working to improve the outcomes of their TB prevention activities.

Action steps for Recommendation 2 are outlined in the table below.

ACTION STEP	PROPOSED LEAD(S) AND PARTNER(S)
1. Produce a TB prevention "playbook" (which includes steps to assess clinic population risk, increase LTBI testing and treatment and methods for measuring the LTBI care cascade) to at least 10 clinics/health systems serving high risk populations	• **TB Control Branch** • **CITC** • University of California, San Francisco (UCSF) Center for TB • Local TB programs • Health clinic leadership
2. Develop partnerships with clinics that serve high risk populations to measure and improve their LTBI care cascades	• **TB Control Branch** • **Local TB programs** • UCSF Center for TB • Clinic partners
3. Disseminate steps for linkage to care for LTBI treatment for immigration status adjustors to California civil surgeons	• **TB Control Branch** • **Local TB programs** • CTCA
4. Implement interventions to improve LTBI treatment outcomes for groups already systematically tested (contacts, B notifications, status adjusters)	• **Local TB programs** • TB Control Branch
5. Demonstrate the feasibility of coupling LTBI testing, referral and care linkages into the COVID-19 testing/vaccine outreach efforts in communities with TB/COVID	• **TB Control Branch** • **Local TB programs** • CDPH Immunization Branch
6. Provide technical assistance to Medi-Cal Managed Care plan leaders to implement LTBI testing and treatment quality improvement projects	• **TB Control Branch** • **CA Department of Health Care Services (DHCS)** • Medi-Cal Managed Care leaders
7. Encourage Medi-Cal Managed Care plan leaders to seek CA DHCS Annual Innovation Awards for its LTBI quality improvement projects	• **TB Control Branch** • **Local TB programs** • Medi-Cal Managed Care leaders

RECOMMENDATION 3

Develop and implement a surveillance system for reporting, tracking and evaluating LTBI in California

The first phase of LTBI surveillance was launched in California in 2016. The Council of State and Territorial Epidemiologists (CSTE) adopted a set of standard criteria that provided a case definition of LTBI.[33] In 2018, the federal government revised the Tuberculosis Technical Instructions for Civil Surgeons to require immigration status adjustors diagnosed with LTBI to be reported to the local health department.[5] In parallel, CDPH began to collect these data systematically through the California Reportable Disease Information Exchange (CalREDIE) Provider Portal. In 2019, the California Code of Regulations Title 17 section 2505[34] was amended to require electronic reporting by laboratories of LTBI identified by a positive laboratory test. IGRA ELR increased from approximately 1,000 reports per month before mandated laboratory reporting to approximately 5,000 reports per month after. As mentioned above, the draft LTBI metrics to monitor performance will be submitted to CMS for review in 2023. Collectively, these advances set the stage for a future point in time when LTBI surveillance in California will support substantial progress toward TB elimination.

Improvements in LTBI reporting will allow California to measure changes in TB infection in the state over time and monitor prevention success.

Barriers to implementing a statewide (or national) LTBI surveillance system exist and must be addressed in order to facilitate the targeted TB elimination progress. Most glaringly, there is an absence of metrics for quality improvement performance — meaning, in most primary care settings, the LTBI care cascade cannot be measured, and therefore interventions to improve outcomes cannot be implemented.

In addition, LTBI and IGRA data quality is insufficient and specific TB risk factors — specifically, nativity, race and ethnicity — are not reported from laboratories via ELR. Further complicating matters is that the state's many health systems do not utilize a universal EHR easily accessible to public

health and LTBI reporting is not yet required — and when it is, it could be cumbersome if all communicable disease programs didn't use the same reporting system.

To implement and make use of the needed data fully at the clinic, jurisdiction and state levels, the dissemination of methods and models for assessing data elements of the LTBI care cascade through EHRs is an important next step.

Action steps for Recommendation 3 are outlined in the table below.

ACTION STEP	PROPOSED LEAD(S) AND PARTNER(S)
1. Publish an annual LTBI report for California, describing LTBI test positivity and treatment completion rates for high risk populations with required evaluation (refugees, new arrivers, status adjustors and contacts)	• **TB Control Branch**
2. Map TB and COVID-19 case overlap to identify hardest hit communities for outreach/testing	• **TB Control Branch** • **Local TB programs**
3. Establish statewide LTBI measures and submit measures to the National Quality Forum for endorsement and to the CMS Adult and Child Core Set Workgroup for addition to the Child and Adult Care Measure Set	• **TB Control Branch** • **Medi-Cal Program, CA DHCS**
4. Update report on treatment completion rates for Medi-Cal participants with LTBI in California	• **TB Control Branch** • Medi-Cal Program, CA DHCS • CDC Division of TB Elimination
5. Implement a statewide surveillance system to track data on individual contacts to TB cases (LTBI test results and treatment outcomes)	• **TB Control Branch** • **Local TB programs** • CDPH Division of Communicable Disease Control (DCDC)
6. Enhance ELR of IGRAs to capture individual risk information and negative IGRA results	• **TB Control Branch** • Local TB programs

TABLE CONTINUES >

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7. Create routine transfer of EHR data to CDPH and local health departments from healthcare entities to measure TB prevention testing and treatment	• **TB Control Branch** • CDPH DCDC • Healthcare networks
8. Promote routine measurement of LTBI testing and treatment in AAPCHO's clinic network	• **AAPCHO** • **TB Control Branch** • **California FQHCs**
9. Outreach to California health system quality assurance managers at top provider settings to measure USPSTF-recommended LTBI testing	• **TB Control Branch** • CA DHCS • Medi-Cal Managed Care organizations • TB program managers • Kaiser Permanente • AAPCHO • California FQHCs

RECOMMENDATION 4

Secure sufficient resources for implementing the California TB Elimination Plan, 2021-2025

Successful public health campaigns need sufficient resources to support their actions and partnerships. For TB elimination, new resources to support a number of efforts — whether they be LTBI surveillance or expanded LTBI testing and treatment — must become available in both clinical and public health settings. Overall, to support an ambitious move toward TB elimination in California, additional resources are needed to address the gaps that currently exist.

Funding streams focused on TB prevention need to be identified and secured.

Without question, TB prevention in California is underfunded and elimination targets will not be met without additional and more diverse funding sources to scale up LTBI testing and treatment. During 2016-2020, the Preventive Health and Health Services Block Grant was used to fund the TB Free California initiative, a partnership led by the TB Control Branch with local TB programs and community partners. Since 2019, some local health departments have also used newly allotted communicable disease funding in 2019/2020 for TB prevention activities.

Overall, however, funding for TB prevention is sparse, and streams for new funding need to be identified and secured. These sources, including philanthropy, industry, government and non-governmental health organizations, are needed to support key elimination initiative actions. For the greatest impact, multiple sources of prevention dollars, including new ones from the private sector, will help to ensure success of this Elimination Plan.

The category "resources" does not just imply monetary funding for TB prevention; it includes human resources, as well as tools and skills to increase capacity within a health department, clinic and/or other environment, all of which are vital components needed for a comprehensive effort for TB elimination.

Since 2016, reimbursable TB prevention activities in local TB programs and the expansion of healthcare access have created precious new

TB diagnosis and short-course LTBI regimens still are not fully available to all and need to be made accessible to the uninsured and underinsured.

resources which provide opportunities for high risk populations to receive needed TB prevention services.[6] However, access is still not fully available to all — diagnostic work-up (to exclude TB disease) and short-course LTBI regimens, which include rifapentine and rifampin, need to be covered without share of cost by all health plans and must be accessible to both the uninsured and underinsured. Ensuring all plan formularies include rifamycins and policies of no cost-sharing for testing and treatment deserves attention. Acquiring these resources is necessary for progressing to pre-elimination in California.

Furthermore, voices to advocate for TB prevention are lacking and the TB prevention and control community needs this advocacy to ensure that the resources for prevention are acquired. The financial and human costs of TB disease are not well known and can be powerfully vocalized by advocates, such as TB survivors and community-based organization representatives that serve populations at risk. Such partners can work together in local and statewide coalitions or as individual partners to local TB programs.

A business case for TB prevention is a tool that could complement the needed advocacy voices, yet does not exist in a format that is accessible to decision makers, making the work to secure additional resources challenging. Funders and policy decision makers need to understand the rationale for funding prevention. The rationale is clear: 1) the cost of preventing TB for one person is minimal ($790), whereas the cost for diagnosing and treating one person with active TB disease is substantially higher ($43,900)[8] and 2) the costs averted by scaling up prevention and reaching elimination targets earlier are enormous (one billion dollars in medical costs and one billion dollars in societal costs).

Action steps for Recommendation 4 are outlined in the table below.

ACTION STEP	PROPOSED LEAD(S) AND PARTNER(S)
1. Define the resources needed for successful implementation of the 2021-2025 California TB Elimination Plan action steps	• **TB Control Branch**
2. Develop a "business case" that describes the compelling human and economic benefit of preventing TB (LTBI testing and treatment)	• **TB Control Branch** • UCSF Center for TB • Local TB programs • Health system leadership
3. Expand California TB coalitions to include leaders and stakeholders of populations most affected by TB	• **Local TB programs** • **CTCA**
4. Ensure synergistic efforts and coordination across the four California TB elimination plans	• **TB Control Branch** • LA, SD, and SF TB programs • CTCA
5. Secure funding from philanthropic, industry, governmental and non-governmental health organizations to support key California TB prevention and elimination efforts	• **CTCA** • State and local TB coalitions • TB Control Branch • CTEAC
6. Establish routine monitoring of rifamycin inventory and price (through the top California distributors) for early warning of drug supply disruptions	• **TB Control Branch** • **Orange County TB program** • Other local TB programs • CA DHCS
7. Ensure rifamycin LTBI medications are on the formulary of the Medi-Cal pharmacy benefit program's (Medi-Cal Rx) formulary	• **TB Control Branch** • **CA DHCS** • **CTCA/California Conference of Local Health Officers (CCLHO)**
8. Ensure full cost coverage of IGRAs by all California health plans, including Medi-Cal Managed Care, Covered California and private plans	• **CTCA/CCLHO** • TB Control Branch • CTEAC workgroup
9. Reduce cost-sharing of IGRA testing and LTBI treatment for healthcare systems	• **CTCA/CCLHO** • TB Control Branch • CTEAC workgroup

RECOMMENDATION 5

Conduct research to evaluate TB prevention strategies

An additional resource that requires a special focus is LTBI research. Research related to LTBI testing and short-course regimens has been instrumental in improving LTBI testing and treatment rates among various populations. While there has been some promising research on vaccines,[7,35,36] as of 2021, there is still no effective vaccine to prevent TB disease.

A California LTBI research network will be established to prioritize and advance evidence-based strategies and TB elimination.

In a multi-site study of the LTBI care cascade, major losses occurred at several key steps, with less than a quarter of at risk patients with LTBI completing treatment.[37] High quality implementation science related to LTBI is needed to identify strategies to increase the uptake of evidence-supported practices in TB prevention. Future work on LTBI implementation science may be informed by U.S.-based research on the HIV care cascade, including data that support use of financial incentives for people living with HIV to increase viral suppression[38], as well as studies of value-based payments and performance rankings[39] to increase routine vaccination in primary care settings. Research, however, that investigates tailored approaches for specific settings and populations, as well as universal interventions, are both important next steps for California.

A cohesive research network in California with a defined research agenda will help advance evidence-based strategies and TB elimination. As of 2021, additional TB prevention research is needed to adequately evaluate TB prevention interventions as well as to analyze the data sets which can inform these assessments.

Action steps for Recommendation 5 are outlined in the table below.

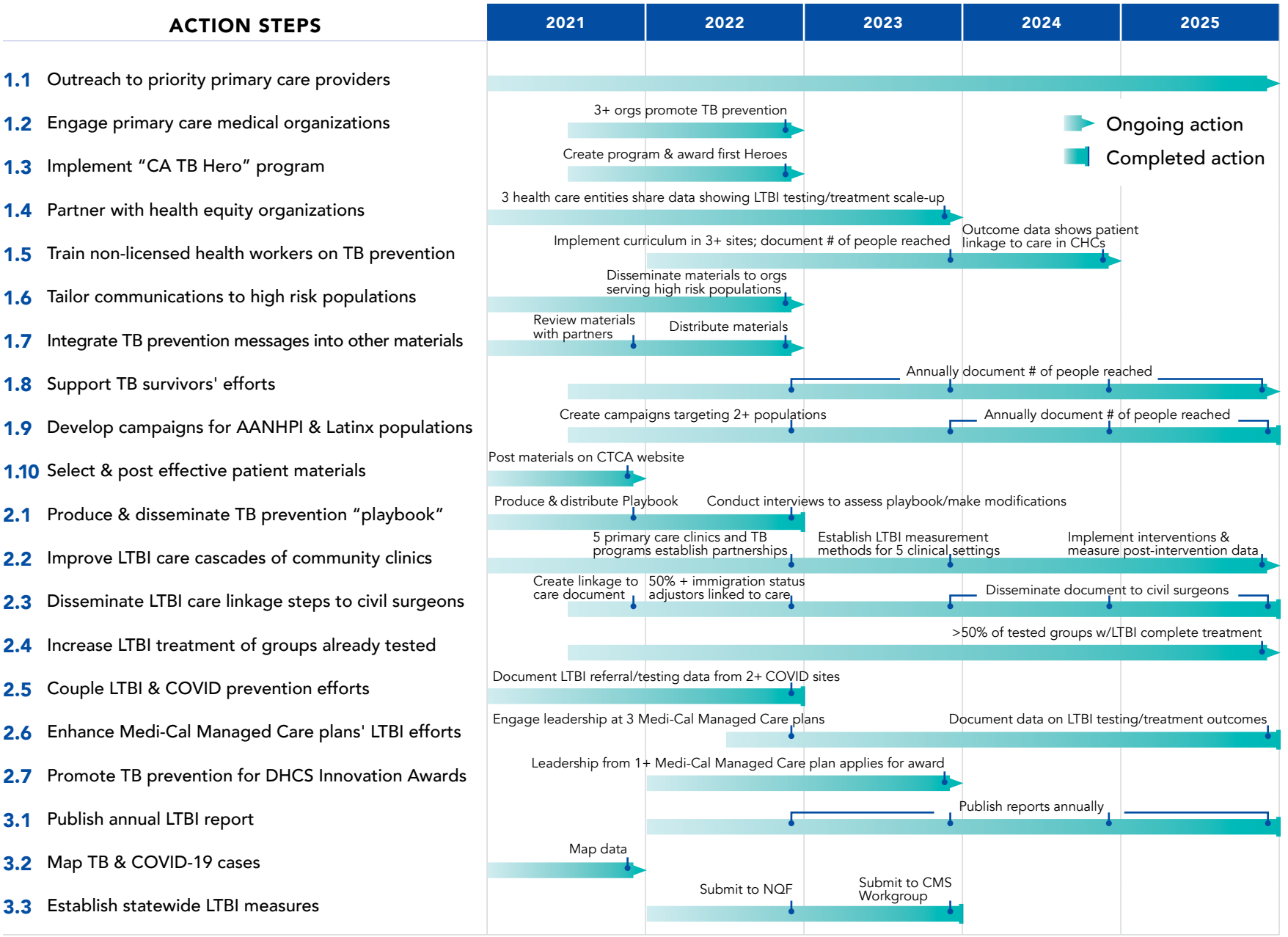
ACTION STEP	PROPOSED LEAD(S) AND PARTNER(S)
1. Establish a research network focused on LTBI in California	• **TB Control Branch** • **UCSF Center for TB** • Academic partners
2. Use TB elimination modeling findings to establish targets for case reduction, TB/LTBI disparity reduction and for achieving TB pre-elimination — for California, Los Angeles, San Diego and San Francisco	• **TB Control Branch** • **Local TB programs with elimination plans** • **UCSF Center for TB** • CTEAC
3. Promote research on implementation of new LTBI diagnostics and treatment in California	• **TB Control Branch** • **UCSF Center for TB** • Local TB programs
4. Conduct research to assess effectiveness and cost-effectiveness of strategies to reduce LTBI care cascade attrition	• **TB Control Branch** • **UCSF Center for TB** • Local TB programs • CDC
5. Analyze large health system and pharmaceutical data sets to provide current information on LTBI testing and treatment practices in California healthcare settings serving high risk communities	• **TB Control Branch** • **UCSF Center for TB**

Implementation Timeline

A five-year implementation timeline is outlined on the next two pages. The timeline outlines each action step's phased start and completion date, discrete milestones and temporal relationship with each of the other steps.

At least annually, the TB Control Branch will monitor the implementation of the Plan and will report on progress made and barriers encountered to CTEAC. It is likely that some of the action step timeframes will be modified during the Plan's five years due to both expected and unexpected implementation barriers.

CA TB Elimination Plan, 2021-2025: Implementation Timeline



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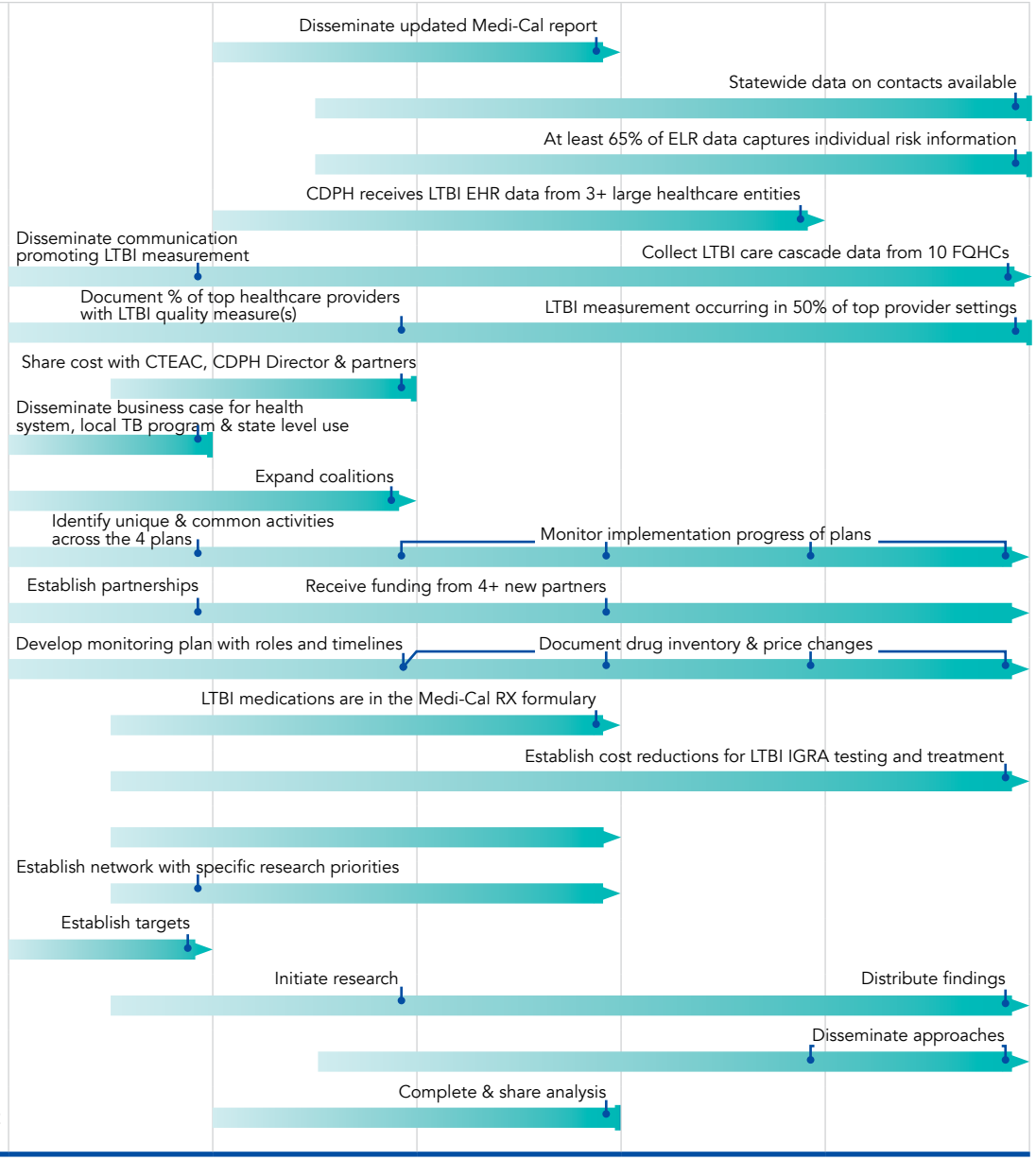
3.4	Update Medi-Cal LTBI treatment completion rates
3.5	Implement statewide TB contact surveillance system
3.6	Enhance IGRA reporting to capture risk
3.7	Create EHR data flow for LTBI surveillance
3.8	Promote LTBI testing/treatment measurement
3.9	Promote USPSTF LTBI testing recommendations
4.1	Define resources for 2021-2025 TB Elimination Plan
4.2	Develop TB prevention business case
4.3	Expand TB coalitions
4.4	Ensure coordination across CA TB elimination plans
4.5	Secure funding to support TB prevention efforts
4.6	Monitor inventory/price of rifamycin medications
4.7	Ensure all rifamycins are on Medi-Cal Rx formulary
4.8	Ensure full coverage of IGRAs by all CA health plans
4.9	Reduce TB prevention costs for healthcare systems
5.1	Establish CA LTBI research network
5.2	Establish TB case & disparity reduction targets
5.3	Promote LTBI testing/treatment implementation research
5.4	Assess strategies to prevent care cascade attrition
5.5	Analyze non-traditional data on LTBI testing/treatment



Partners Needed for Tuberculosis Elimination

The elimination of TB in California can only occur with a multitude of stakeholders participating in the implementation of this Plan. As illustrated in the action step tables, which begin on page 37, both lead and partner organizations have been proposed for each action step. TB Control Branch staff and CTEAC members will outreach to these proposed leads and partners to describe the needed actions and recruit their participation. An "all hands on deck" approach is needed to ensure the full implementation of this Plan and that its successes are sustained.

TB survivors have powerful experiences to share that illustrate why TB prevention is crucial.

A diverse group of partners are represented in this Plan. Key collaborators include the 61 local TB programs in California — they are the backbone of TB prevention and control efforts throughout the state. Yet most of these local health departments are understaffed and lack sufficient resources to do what is needed to promote TB prevention, particularly since the onset of the COVID-19 pandemic, and therefore need support to implement an array TB prevention efforts. One of the primary functions of the TB Control Branch is to provide consultation, technical assistance, education, training and resources to support local TB programs. The TB Control Branch will be conducting many of the activities outlined in this Plan and will continue to play an important leadership role throughout Plan implementation.

Critical to the success of the Plan is the active engagement of community-based organizations which serve populations at high risk for TB. Community leaders often serve as gatekeepers to their communities; they are keenly aware of the unique needs and perspectives of their community members. However, it isn't enough simply to engage the formal leadership of these organizations; community members themselves should participate in TB prevention planning efforts. Ideally, TB survivors, who have unique perspectives to contribute, play an important role in promoting community engagement and in advocating for TB prevention resources.

Furthermore, they often have powerful stories to share, which bring a sharp focus to the "face of TB" presented to their communities as well as to policymakers and funders.

Additional partners from other sectors of the wide range of TB elimination stakeholders are needed to participate in facilitating TB elimination in California. These include CTCA, a network of TB public health experts working to prevent and control TB in the state, and an affiliate of the California Conference of Local Health Officers (CCLHO). CTCA is currently building the "Coalition for a TB-Free California", which declares a "TB-free California" as its vision. Other important partners include: the California DHCS; other state and national government organizations; community clinics and healthcare systems; and academic researchers. Each of these groups has both overlapping and unique perspectives and skills which will contribute to the success of this Plan.

Evaluation Plan

An overview of how this Elimination Plan will be evaluated is illustrated in the logic model on the next page. A more detailed plan that identifies data sources and reporting organizations for the specific performance measures for 2025 is provided in Appendix E. In addition, this more extensive plan describes, by Elimination Plan recommendation, the performance measures for each of the action steps.

Together, both CTEAC and the TB Control Branch will take the lead to monitor Plan implementation at least once per year. Modifications to the Plan will be made as necessary. These assessments, plus any Plan modifications made, will be shared annually with CTEAC members and other TB stakeholders throughout California.

Elimination Plan Logic Model

BARRIERS	RESOURCES	ACTIONS	2025 OUTCOMES	LONG-TERM OUTCOMES
Lack of TB prevention awareness and engagement Lack of patient and provider knowledge about LTBI testing and treatment Lack of statewide LTBI surveillance system and metrics Absence of continuous dedicated resources for TB prevention Insufficient TB prevention research	Staff Partnerships Funding Training Technical assistance New technologies Research	**1. Find and engage persons/populations at high risk for TB and their providers** • Promote prevention strategies to providers/health systems • Disseminate tailored effective prevention messaging • Recruit TB survivors; train non-clinical health workers **2. Focused and effective TB testing and optimize treatment for LTBI** • Disseminate LTBI care methods and train providers • Couple TB and COVID-19 prevention efforts • Implement interventions to improve LTBI treatment outcomes for groups systematically tested **3. Implement a surveillance system for reporting, tracking and evaluating LTBI** • Submit LTBI measures for endorsement and adoption • Implement a statewide LTBI surveillance system • Enhance technologies to measure and improve LTBI reporting (ELR, EHRs) **4. Secure sufficient resources for implementing the CA TB Elimination Plan** • Define TB Elimination Plan cost; develop business case • Expand coalitions; coordinate state's elimination activities • Establish funding partnerships, secure new funding • Include LTBI regimens in pharmacy benefit; establish LTBI medication supply monitoring • Reduce health system expense and patient cost-sharing of IGRA testing and LTBI treatment **5. Conduct research to evaluate TB prevention strategies** • Establish TB elimination targets; research/disseminate most effective approaches for LTBI care success • Establish LTBI research network and prioritize research • Analyze large health system and pharmaceutical data sets	• Increase LTBI testing to 80% • Increase LTBI treatment completion to 77% • Reduce cases to 38/million (1,500/year) • Reduce non-U.S.-born TB case rate by at least 25% (116/million) • Reduce deaths to 150/year (3.8/million)	Prevent TB disease developing in persons with LTBI ∨ Decrease TB case rate ∨ Decrease in health disparities ∨ Pre-elimination by 2035 (400 cases/year, <10/million) ∨ Elimination by 2050 (40 cases/year, <1/million)

How to Support this Plan

The successful implementation of this TB Elimination Plan can be achieved with the participation and coordinated efforts of a diverse group of stakeholders. The 61 local health departments, CDPH, public health associations (e.g., CTCA), community health clinics, academic partners, health plan administrators, community-based organizations, advocacy and patient survivor groups and many others — as well as the public — have roles to play.

An "all hands on deck" approach is needed to turn this Elimination Plan into reality.

Listed below is a sampling of the many ways the Plan can be supported through diverse partnerships. A number of the actions below, and outlined in the action steps, describe activities already being implemented. Many are not new, but may require intensification to make progress toward elimination in California.

Local health departments

- Conduct outreach to and education for providers and the community, focused on LTBI testing and treatment
- Ensure LTBI testing and treatment (if infected) of immigrants and refugees who have undergone pre-immigration TB screening for LTBI
- Work with civil surgeons, community health clinic staff and other community providers serving non-U.S.-born populations to raise their awareness about the potential for LTBI and TB, reduce delays in diagnosis and intensify targeted testing and treatment programs for LTBI
- Build strong TB prevention partnerships with both public and community providers, and support their efforts to measure and improve their LTBI care cascade outcomes
- Support community-based LTBI testing and treatment programs for populations at high risk
- Develop local TB coalitions to foster community and provider engagement in TB prevention activities
- Participate in training new public health workers in TB prevention and control

California Department of Public Health TB Control Branch

- Promote among partners the most effective strategies for testing populations at high risk for TB
- Establish systematic mechanisms for reporting LTBI and tracking treatment outcomes
- Prevent loss of core TB control capacity; work to increase or sustain resources to maintain core TB programs
- Continue to provide local assistance to local health departments, including support for TB prevention activities
- Implement a statewide LTBI surveillance system
- Promote messaging to community providers about the USPSTF TB screening recommendation
- Provide technical assistance and consultation to community providers/health systems for intensifying LTBI targeted testing and treatment activities
- Identify COVID-19 response innovations which can provide opportunities for TB prevention
- Collaborate with CTEAC, the Coalition for a TB-Free California and other stakeholders to fully implement the California TB Elimination Plan
- Secure new sources of funding for TB prevention pilot projects
- Participate in a statewide research network focused on TB prevention

California TB Controllers Association and other networks of public health communicable disease providers

- Continue to update and disseminate new guidelines on best practices for testing and treating populations at high risk for LTBI
- Build the Coalition for a TB-Free California to promote elimination across California
- Secure new sources of funding for TB prevention projects
- Participate in efforts to ensure services and costs for LTBI testing and treatment are accessible
- Participate in the development and dissemination of communication strategies focused on LTBI testing and treatment for providers, health systems and high risk communities

Primary care providers and community health clinics providing care to populations at risk

- Make the diagnosis and treatment of LTBI a priority activity in primary care of non-U.S.-born Californians
- Utilize the TB risk assessment tool to identify and test patients at high risk for LTBI
- Become educated about optimal practices for testing and treatment and/or request clinical consultation from public health departments
- Maximize LTBI treatment initiation and ensure completion in patients who have LTBI
- Educate patients at high risk about the need for LTBI testing and treatment for LTBI
- Provide simple and clear messaging about treatment to individuals with LTBI

Health systems and health plans

- Collaborate with CDPH, DHCS, Covered California and California Healthy Families to ensure the USPSTF TB screening recommendation is implemented by health plans
- Communicate to providers the importance of LTBI treatment initiation and completion
- Implement quality assurance projects to measure their providers' LTBI care cascades

Academic and other researchers

- Establish and participate in research networks focused on TB prevention
- Investigate targeted TB prevention approaches for specific settings and populations
- Study the cost-effectiveness of different TB prevention strategies

Advocacy groups and community-based organizations

- Work in partnership with the Coalition for a TB-Free California to reduce financial barriers for TB prevention services
- Create simple TB prevention messages for dissemination to policymakers and populations at high risk
- Promote the engagement of high risk communities to participate in TB prevention education messaging
- Support TB survivors to be effective messengers of the need for TB prevention

Pharmaceutical industry

- Ensure a sufficient supply of LTBI drugs, especially rifapentine, to meet demand
- Develop less complex LTBI regimen preparations for adults and children
- Offer reduced rates for regimens as incentives for providers who prescribe short-course LTBI treatment
- Ensure robust patient assistance programs for LTBI treatment
- Sponsor special education events for primary care community providers who need a greater understanding and knowledge of TB prevention

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Appendices

A. Glossary of Terms

B. Glossary of Abbreviations

C. California Tuberculosis Elimination Plan, 2016-2020 — Selected Achievements

D. Participants at December 2020 CTEAC Meeting

E. Evaluation Plan

Appendix A:

Glossary of Terms

Asian American (AA): Persons having origins in any of the original peoples of Asia, Southeast Asia, or the Indian subcontinent including, for example: Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Indonesia, Thailand, or Vietnam.*

Asian American, Native Hawaiian and Pacific Islander (AANHPI): See entries Asian American (AA), Native Hawaiian (NH) and Pacific Islander (PI).*

Bacille Calmette-Guérin (BCG) vaccine: A vaccine used to prevent disseminated TB disease in children. Use of IGRAs to test for TB infection are preferable for use with BCG-vaccinated individuals to avoid the false positive results that can occur with the TB skin test.

California Healthy Families: A low cost insurance program for California children and teens. It provides health, dental and vision coverage to children who do not have insurance and do not qualify for free Medi-Cal.

California Reportable Disease Information Exchange (CalREDIE): A computer application created by the California Department of Public Health for web-based disease reporting and surveillance.

California Tuberculosis Elimination Advisory Committee (CTEAC): Comprised of TB experts — including staff from local TB programs, community providers, federally-qualified health centers, TB patient survivors, academic researchers and TB control organizations – this Committee participated in the development of this five-year TB Elimination Plan and will monitor its implementation for the state of California.

Civil surgeons: Physicians who are designated by U.S. Citizenship and Immigration Services (USCIS) to perform immigration medical examinations of immigrants who are requesting that their immigration status be adjusted. Civil surgeons perform these examinations according to the specific technical instructions for different infectious diseases, e.g., TB, syphilis, provided by CDC.

** It is important to note that communities and individuals may understand and identify with certain racial and ethnic groups differently and change over time.*

Community providers: A general term that refers to a wide range of clinicians that provide care to patients in private settings, e.g., private practice groups, health maintenance organizations, community clinics.

Contact investigation: A process performed (usually by health department staff) to identify people who have had contact with a person with TB disease, assess them for LTBI and TB disease, and provide, when appropriate, treatment for LTBI or TB disease. This is a priority activity which is critical for preventing future cases of TB.

Federally-qualified health centers (FQHCs): Community-based healthcare clinics that receive federal funds to provide primary care services in underserved areas.

Interferon-gamma release assay (IGRA): Whole-blood tests that can aid in diagnosing *M. tuberculosis* infection. The tests do not differentiate LTBI from TB disease. Unlike the tuberculin skin test, only a single patient visit is required to conduct the test, results are available in 24 hours and prior BCG vaccination does not cause a false-positive IGRA test result.

Latent tuberculosis infection (LTBI): Individuals with LTBI carry *M. tuberculosis*, the organism that causes TB, but do not have TB disease; they are asymptomatic and non-infectious. Individuals with LTBI usually have a positive reaction to the tuberculin skin test and have a positive IGRA blood test.

LTBI prevention and care cascade: A care cascade that outlines the discrete steps needed to diagnose and treat people with LTBI. At each step, patients and prevention opportunities can be lost, so "measuring" a clinic's care cascade allows effective interventions to be implemented to decrease patient attrition at each step.

LTBI reservoir: The population of individuals who have LTBI but have not yet progressed to TB disease.

Medi-Cal: The Medicaid program in California, administered by the California Department of Health Care Services. Medi-Cal is a public health insurance program which provides needed healthcare services for low-income individuals.

Native Hawaiian (NH): Persons having origins to any of the original peoples of Hawai'i as defined in the Native Hawaiian Health Care Improvement Act as "distinct and unique indigenous people with a historical continuity to the original inhabitants of the Hawaiian archipelago whose society was organized as a Nation prior to the arrival of the first nonindigenous people in 1778" (42 USC § 11701(1)).*

Pacific Islander (PI): Pacific Islanders are the distinct and unique indigenous peoples descended from the original inhabitants of the nations within Oceania. The Health Resources & Services Administration's Uniform Data System defines Pacific Islanders as those having origins in any of the original peoples of Guam, Samoa, Tonga, Palau, Chuuk, Yap, Saipan, Kosrae, Ebeye, Pohnpei or other Pacific Islands in Micronesia, Melanesia, or Polynesia.*

Status adjustors: Immigrants who are applying to change their immigration status to become lawful permanent residents in the U.S.

Surveillance: Ongoing systematic collection, analysis and interpretation of health data essential to the planning, implementation and evaluation of public health practice, closely integrated with the timely dissemination of these data to those who need to know in public health programs.

TB elimination: An epidemiologic term defined as <1 TB case per million population. For California in 2020, this translates to an elimination target of 40 annual cases.

Tuberculin skin test (TST): A skin test to determine whether a person has LTBI. The test is administered by injection of a small amount of tuberculin fluid under the skin of the forearm. The individual must return within 48 to 72 hours after the test is placed to have a trained healthcare worker look for and measure a reaction on the arm.

Tuberculosis (TB): An infectious disease caused by the bacterium *M. tuberculosis*. The bacteria usually attack the lungs, but TB bacteria can attack any part of the body such as the kidney, spine and brain. If not treated properly, TB disease can be fatal.

United States Preventive Services Task Force (USPSTF) TB screening recommendation: In 2016, the USPSTF published a recommendation to screen populations at increased risk for LTBI (B recommendation).

** It is important to note that communities and individuals may understand and identify with certain racial and ethnic groups differently and change over time.*

Appendix B:

Glossary of Abbreviations

AANHPI..... Asian Americans, Native Hawaiian and Pacific Islanders

AAPCHO..... Association of Asian Pacific Community Health Organizations

ARPE..... Aggregate Reports for Tuberculosis Program Evaluation

BCG ..... bacille Calmette-Guérin

CalREDIE..... California Reportable Disease Information Exchange

CCLHO ..... California Conference of Local Health Officers

CDPH..... California Department of Public Health

CHC ..... community health clinic

CITC..... Curry International TB Center

CMS ..... Centers for Medicare & Medicaid Services

CTCA ..... California Tuberculosis Controllers Association

CTEAC..... California Tuberculosis Elimination Advisory Committee

DCDC ..... (CDPH) Division of Communicable Disease Control

DHCS..... (California) Department of Health Care Services

EDN ..... Electronic Disease Notification

EHR ..... electronic health records

ELR..... electronic laboratory reporting

FQHC..... federally-qualified health center

IGRA ..... interferon-gamma release assay

LHD..... local health department

LTBI ..... latent TB infection

MCMC..... Medi-Cal Managed Care

NQF..... National Quality Forum

QALY ..... quality-adjusted life year

TBCB..... (CDPH) Tuberculosis Control Branch

TBESC..... Tuberculosis Epidemiologic Studies Consortium

TBFCA ..... TB Free California (TBCB project)

USPSTF..... United States Preventive Services Task Force

UCSF..... University of California, San Francisco

Appendix C:

California TB Elimination Plan, 2016-2020 — Selected Achievements

RECOMMENDATION 1

Find and engage persons and populations at high risk for TB and their providers in California

- Produced detailed maps of TB disease incidence and non-U.S.-born residents to locate communities at risk for TB for engagement and micro-elimination
- Identified California primary care clinics with population profiles suggesting high risk for TB
- Distributed contact information for 130 medical providers in clinics serving high risk communities to local TB control programs
- Posted list of language-fluent medical providers who represent potential sources of care for high risk Californians

RECOMMENDATION 2

Apply focused and effective strategies for TB testing in California

- TB risk assessment tools developed, simplified, harmonized and widely disseminated
- 2018 CTCA/CDPH LTBI guidance document disseminated to healthcare providers
- Local TB programs began increasing their LTBI testing and treatment outreach in high risk populations
- Covered California notified Exchange plans re: U.S. Preventive Services Task Force LTBI recommendation
- Disseminated an algorithm for LTBI provider testing and treatment and CDC LTBI Treatment Guideline summary to 130 high priority medical providers
- Contributed evidence that IGRA is preferred over the TB skin test
- Large increase in IGRA use and decrease in TB skin test use documented in California's TB case registry

RECOMMENDATION 3

Optimize treatment for LTBI

- 19 of 22 Medi-Cal Managed Care plans and MyHealth LA pharmacy formulary now include rifapentine on their respective formularies
- Electronic directly-observed therapy is now Medi-Cal reimbursable for LTBI treatment
- Large increase in short course regimens used for LTBI treatment of new arrivers with B notification
- CDPH TB Control Branch established a technical assistance process for LTBI/TB drug supply interruptions

RECOMMENDATION 4

Develop strong and effective partnerships to eliminate TB in California

- TBCB's TB Free California (TBFCA) project and local health departments contributed to the scale-up of LTBI testing and treatment at seven clinical sites
- Four TBFCA partner community clinics measured care cascade baselines, providing data for performance improvement
- Medi-Cal notified California plans that LTBI testing is a preventive service benefit requiring no cost-sharing
- TBFCA provided technical assistance to aid the University of California system in adopting a mandatory TB screening mandate for incoming students
- Extensive outreach and education conducted for civil surgeons to educate them on revised CDC TB Technical Instructions and to promote effective messaging and referrals re: LTBI treatment
- TBFCA established partnerships with seven community-based organizations serving AANHPI communities
- TBFCA established partnerships with the federal Health Resources and Services Administration and CDPH Diabetes Branch
- TBFCA became a member of AAPCHO's new TB Community Engagement Network

RECOMMENDATION 5

Create an effective communication plan to promote testing for and treatment of LTBI to health providers and the community in California

- LTBI clinical tools, guidelines and other resources for providers developed, widely disseminated and posted online (see https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/TB_Provider_Resources.aspx)
- Increased efforts to integrate TB prevention into primary care-JAMA editorial published by TBCB; and TBCB co-produced LTBI webinar with California Primary Care Association
- TB prevention materials developed in multiple languages and disseminated for use with communities at risk (print materials, videos)
- Active TB elimination coalitions began operating in Los Angeles and San Diego counties; experienced non-governmental organization Treatment Action Group (TAG) and CTCA supported expansion of Los Angeles Coalition
- New TB survivor testimonials produced and used for outreach and education to providers and populations at risk for TB
- Three TB programs in California increased engagement with TB patients and began training them as advocates
- CTCA created a social media marketing plan to disseminate LTBI testing and treatment messages
- CTCA hired a Patient Peer Support Navigator to create and disseminate messaging for high risk populations

RECOMMENDATION 6

Develop and implement a surveillance system for reporting, tracking and evaluating LTBI in California

- Two LTBI metrics developed and are being piloted in largest health maintenance organization in California
- Mandated electronic laboratory reporting of positive IGRAs went into effect October 2019
- LTBI reporting systems implemented for mandated reporting of positive IGRAs by civil surgeons
- CDPH released summary reports of number of positive IGRAs reported by jurisdiction
- CDPH released summary reports of positive IGRAs in status adjustors reported by civil surgeon and linkage to care successes
- Seven clinical sites, with TBFCA technical assistance, implemented changes in their EHRs to enable measurement of their respective LTBI care cascades
- Los Angeles TB program is integrating the TB risk assessment tool into its new ORCHID system
- TBFCA identified EHR best practices for LTBI care cascade record
- Publication of validation of EHR data for care cascade by UC San Diego

RECOMMENDATION 7

Secure sufficient resources for implementing the California TB Elimination Plan

- TBFCA project funded and worked with multiple sites to scale up LTBI testing and treatment; conducted provider training (>1100 providers) and provided technical assistance to more than 100 local, state and national healthcare organizations on LTBI best practices
- Created >20 provider and patient/public educational materials and tools (five of which have received CDC recognition)
- Three new ICD-codes for LTBI went live in October 2019
- Medi-Cal and Medicare codes for TB risk assessment reimbursement established and disseminated for use
- New national stockpile of LTBI drugs, including rifapentine
- A single statewide Medi-Cal formulary will enable negotiation of LTBI treatment costs (effective 2021)
- CTCA earmarked philanthropic industry grant funds to hire a consultant to develop and manage a statewide TB elimination coalition
- TB elimination plans for 2021-2025 under development at four California sites (Los Angeles, San Diego, San Francisco, CDPH), with substantial input from local advisory groups and/or community coalitions
- TB Community Engagement Network (AAPCHO-led) "mini-grants" secured by community-based organizations and community clinics in California to enhance engagement and education to high risk AANHPI populations and their providers

Appendix D:

Participants at December 2020 CTEAC Meeting

CTEAC members

Erica Pan, MD, MPH	CTEAC Co-Chair State Epidemiologist Deputy Director Center for Infectious Diseases	California Department of Public Health Sacramento, CA
George Rutherford, MD	CTEAC Co-Chair Professor Epidemiology and Biostatistics Director Prevention and Public Health Group School of Medicine	University of California, San Francisco San Francisco, CA
Lisa Albers, MD, MC II	Medical Consultant II Managed Care Quality Monitoring	California Department of Health Care Services Sacramento, CA
Jeannette Aldous, MD	Clinical Director of Infectious Disease	San Ysidro Health Center San Diego, CA
Jennifer Arnold, MD	Chair Infection Control Committee Infectious Disease Specialist	Kaiser Permanente Oakland, CA
Angelito Bravo	President Program Manager Pulmonary Disease Services	California Tuberculosis Controllers Association Orange County Healthcare Agency Santa Ana, CA
Michael Carson, MSPM	Division Manager Clinical Services *Recently retired*	Orange County Health Care Agency Santa Ana, CA
Amit Chitnis, MD, MPH	TB Controller Division of Communicable Disease Control and Prevention	Alameda County Public Health Department San Leandro, CA
Barbara Cole, RN, PHN, MSN	TB Controller and Program Manager TB Control Program	Riverside Department of Public Health Riverside, CA
Jennifer Flood, MD, MPH	Chief	CDPH TB Control Branch Richmond, CA
Anna Harte, MD	Medical Director University Health Services	University of California, Berkeley Berkeley, CA

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April King-Todd, RN, BSN, MPH	Nurse Manager TB Control Program	Los Angeles County Department of Public Health Los Angeles, CA
Krystal Liang, PHN	PHN Nursing Supervisor TB Control Program	San Diego County Health and Human Services Agency San Diego, CA
Kristen V.	TB Survivor	San Francisco, CA
Julie Vaishampayan, MD, MPH	TB Controller TB Control Program	Stanislaus County Health Services Agency Modesto, CA

CTEAC liaisons

Lisa Chen, MD	Medical Director and Principal Investigator	Curry International Tuberculosis Center Berkeley, CA
Joe Lee, MSHA	Training and Technical Assistance Director	Association of Asian Pacific Community Health Organizations San Leandro, CA
Suraj Madoori, MSJ, MPH, MA	U.S. and Global Health Policy Director	Treatment Action Group New York, NY
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CTEAC stakeholders

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Daveena Ma, MD	Associate Chief Medical Officer Medical Center Site Director	Asian Health Services Oakland, CA
Suraj Madoori, MPH, MSJ, MA	U.S. and Global Health Policy Director	Treatment Action Group Washington, DC
Marisa Moore, MD, MPH	Epidemiologist Captain, U.S. Public Health Service Public Health Services Tuberculosis Control and Refugee Health Branch	San Diego County Health and Human Services Agency San Diego, CA
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Stephanie Spencer, MA	Program Liaison	CDPH TB Control Branch Richmond, CA

Appendix E:

Evaluation Plan

California Tuberculosis Elimination Plan, 2021-2025 Evaluation Measurement Plan

(See Appendix B for key to abbreviations)

OUTCOMES	DATA SOURCE(S)
Increase LTBI testing to 80% by 2025 *(Numerator and denominator data for discrete target populations will be specified for this target)*	• State contact investigation reports • CDC Electronic Disease Notification data • Medi-Cal data • IGRA data • Status adjustor data • Local demonstration sites for TB prevention activities
Increase LTBI treatment completion to 75% by 2025 *(Numerator and denominator data for discrete target populations will be specified for this target)*	• State contact investigation reports • CDC Electronic Disease Notification data • Medi-Cal data • IGRA data • Status adjustor data • Local demonstration sites for TB prevention activities
Reduce cases by at least 30% to 38/million (1,500/year) by 2025	• California TB case registry
Reduce non-U.S.-born TB case rate by at least 25% (116/million) by 2025	• California TB case registry
Reduce deaths with TB by at least 25% to 150/year (3.8/million) by 2025	• California TB case registry
Reach pre-elimination (<10/million) by 2035	• California TB case registry
Reach elimination (<1/million) by 2050	• California TB case registry

RECOMMENDATION 1

Find and engage persons and populations at high risk for TB and their providers in California

ACTION STEPS	OBJECTIVES	PERFORMANCE MEASURES
1.1 1.2 1.3	Increase provider awareness of TB prevention: • By 2022, at least 3 primary care medical organization leaders provide messaging to their memberships to promote TB prevention • By 2022, create California TB Hero program to recognize providers and organization leaders, and first Heroes awarded • By 2023, at least 3 local TB programs provide messaging to top primary care providers serving non-U.S.-born populations in California to promote TB prevention	Increased LTBI testing and treatment among patients of 3 clinics and medical organizations and among patients of priority primary care providers across 3 LHJs, compared to 2020 baseline At least 2 Heroes receive recognition by 2022
1.4	By 2023, 3 healthcare entities focused on health equity and hepatitis B initiatives serving AANHPI populations, implement a plan to increase LTBI testing and treatment in each setting, including collecting and sharing data	20% increase in LTBI testing and treatment among patients of each healthcare setting, compared to 2021 baseline
1.5 1.6 1.7 1.8 1.9 1.10	Engage high risk communities to increase awareness and understanding of TB risk among high risk populations: • By 2021, identify and post the most effective patient education materials on the CTCA website • By 2022, integrate TB messages into public health campaigns targeted to high risk audiences, such as diabetes/tobacco/HIV, and disseminate through various avenues, including social media • By 2022, create TB public awareness campaigns, in-language and culturally appropriate, targeted to an AANHPI population and a Latinx population • By 2023, implement a curriculum in at least 3 LHJs to train non-licensed health workers in community health clinics to provide TB prevention messaging and linkage to care to high risk persons in AANHPI and Latinx communities • Throughout 2021-2025, patient survivor groups disseminate TB prevention messages to highest risk communities	Knowledge of TB risk among 50-100 persons in high risk Vietnamese, Filipino and Latinx communities. Target: 50-100 Number of non-licensed healthcare workers trained. Target: 90 Number of people reached by a specific message (e.g., via radio, print, web-based, community meeting). Target: 500 Number of community members reached by outreach/education 2022-2023. Target: 500 Key TB survivor messages posted on TBCB/CTCA websites

RECOMMENDATION 2

Apply focused and effective strategies for TB testing in California and optimize treatment for LTBI

ACTION STEPS	OBJECTIVES	PERFORMANCE MEASURES
2.1 2.2	Engage and develop partnerships with clinics serving high risk populations: • By 2021, produce and disseminate a TB prevention "Playbook" to at least 10 clinics/ health systems serving high risk populations • By 2022, conduct key informant interviews with clinic leaders to assess Playbook utilization; and then modify, as needed • By 2022, establish partnerships between 5 primary care clinics and TB programs • By 2023, measure baseline LTBI care practices and establish ongoing measurement methods for 5 clinical settings • By 2025, implement interventions addressing barriers to LTBI care; measure post-intervention care cascade data	Number of Playbooks distributed At least 50% of at risk patients receive LTBI testing in 5 clinics At least 50% of at risk patients with LTBI complete treatment in 5 clinics
2.3	Disseminate steps for linkage to care for LTBI treatment for immigration status adjustors to California civil surgeons: • By 2021, create a document with linkage to care steps, sites for care and LHJ points of contact • 2022-2025, distribute document to civil surgeons	Number of documents distributed to civil surgeons At least 50% of California immigration status adjustors are linked to care At least 50% of status adjustors are referred to treatment, and initiate and complete treatment
2.4	2022-2025, implement interventions to improve LTBI treatment outcomes for groups already systematically tested (contacts, B notifications, status adjusters)	At least 50% of contacts, persons with B notifications and status adjustors with LTBI are referred to treatment, and initiate and complete treatment
2.5	By 2022, demonstrate the feasibility of coupling LTBI testing, referral and care linkages into COVID-19 testing/vaccine outreach efforts in communities with TB/COVID	Number of LTBI referrals and tests for at least 2 sites of COVID testing/vaccine administration. Target: At least 100 tests per site

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2.6 2.7	By 2022, engage MCMC plan leadership in LTBI-related quality improvement projects for 3 MCMC sites By 2023, leadership from one MCMC plan applies for CA DHCS Innovation Award	At least 50% of patients with LTBI at each of the 3 MCMC sites are referred for LTBI treatment, and initiate and complete treatment

RECOMMENDATION 3

Develop and implement a surveillance system for reporting, tracking and evaluating LTBI in California

ACTION STEPS	OBJECTIVES	PERFORMANCE MEASURES
3.1 3.3 3.4 3.9	Promote measures and reports showing LTBI testing and treatment completion rates for high risk populations: • Annually, publish LTBI report describing number and percent of positive tests and treatment completion rates for high risk California populations that undergo required evaluation • By 2023, submit LTBI measures for proposed national adoption • By 2023, generate updated report with LTBI treatment completion rates for Medi-Cal participants • By 2022, outreach to health system quality assurance managers at top provider settings in California to measure USPSTF recommended LTBI testing	LTBI report for California and by LHJ published LTBI measures submitted to the National Quality Forum LTBI measures submitted to the Centers for Medicare & Medicaid Services, Adult/Child Core Set Workgroup LTBI testing measured in at least 50% of top 10 provider settings At least 50% of top 10 healthcare provider settings have LTBI quality measure(s)
3.2	By 2021, map TB and COVID-19 case overlap to identify hardest hit communities for outreach/ testing	Identify top # of communities hardest hit by COVID and TB, to prioritize outreach and testing Disseminate map to TB elimination partners

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3.5 **3.6** **3.7**	**Establish and enhance systems collecting statewide LTBI surveillance data:** • By 2025, implement a statewide surveillance system that tracks data on individual contacts to TB cases (LTBI results and treatment outcomes) • By 2025, enhance ELR of IGRAs to capture individual risk information • By 2024, create routine systematic transfer of EHR data to CDPH and local health departments from healthcare entities	Descriptive analysis of characteristics of individuals with LTBI Descriptive analysis of risk information among a majority of those tested for LTBI EHR data containing LTBI testing and treatment from at least 3 large healthcare entities received by CDPH At least 65% of ELR data captures individual risk information Analysis of EHR LTBI testing and treatment data from 3 large healthcare entities
3.8	**By 2021, promote routine measurement of LTBI testing and treatment in the AAPCHO clinic network**	LTBI care cascade data from 10 FQHCs collected and compiled

RECOMMENDATION 4

Secure sufficient resources for implementing the California TB Elimination Plan

ACTION STEPS	OBJECTIVES	PERFORMANCE MEASURES
4.1 4.2	Describe rationale for TB prevention funding, and secure funding streams tied to prioritized activities: • By 2021, develop a business case that describes the compelling rationale and cost-effectiveness/savings of preventing TB disease • By 2022, define resources needed for successful implementation of the 2021-2025 California TB Elimination Plan action steps	Justification for the cost-effectiveness of TB prevention is disseminated for health system, local TB program and state level use
4.3 4.4 4.5	Develop partnerships and enhance TB prevention coalitions: • By 2022, expand California TB coalitions to include representatives of the populations most affected by TB • 2021-2025, ensure synergistic efforts and coordination across the four California TB elimination plans • By 2023, secure funding from philanthropic, industry, governmental and non-governmental health organizations	Statewide and local TB coalitions memberships are expanded Unique and common activities identified across the four elimination plans Progress monitored on each of the four TB elimination plans New partnerships established Funding received from at least four new partners
4.6 4.7 4.8	Reduce cost barriers and mitigate disruptions of key LTBI testing and treatment supplies: • By 2023, establish routine monitoring of rifamycin inventory and price for early warning of supply disruptions • By 2023, include LTBI medications rifapentine and rifampin in the formulary of Medi-Cal pharmacy benefit program (Medi-Cal Rx) • By 2025,reduce cost-sharing of IGRA testing and LTBI treatment for healthcare systems	Drug inventories and price changes documented and disseminated LTBI medications are on the Medi-Cal Rx formulary Cost reductions established for IGRA testing and LTBI treatment

RECOMMENDATION 5

Conduct research to evaluate TB prevention strategies

ACTION STEPS	OBJECTIVES	PERFORMANCE MEASURES
5.1	By 2021, establish a research network focused on LTBI in California	Research plan developed and specific priorities identified
5.2	By 2021, use TB elimination modeling findings to establish targets for case reduction, TB/LTBI disparity reduction and for achieving TB pre-elimination, for California, Los Angeles, San Diego and San Francisco	Case and disparity reduction and pre-elimination targets established Progress assessed in meeting new targets for case and disparity reduction
5.3	2022-2025, conduct research on implementation of new LTBI diagnostics and treatment in California	The most effective approaches for successful LTBI outreach, testing, and treatment are identified and disseminated
5.4	2022-2025, conduct ongoing research to assess the effectiveness and cost-effectiveness of strategies to reduce attrition in the LTBI care cascade	Research initiated Findings distributed
5.5	By 2023, analyze large health system and pharmaceutical data sets to provide current information on LTBI testing and treatment practices in California healthcare settings serving high risk communities	Analysis completed and shared with partners

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