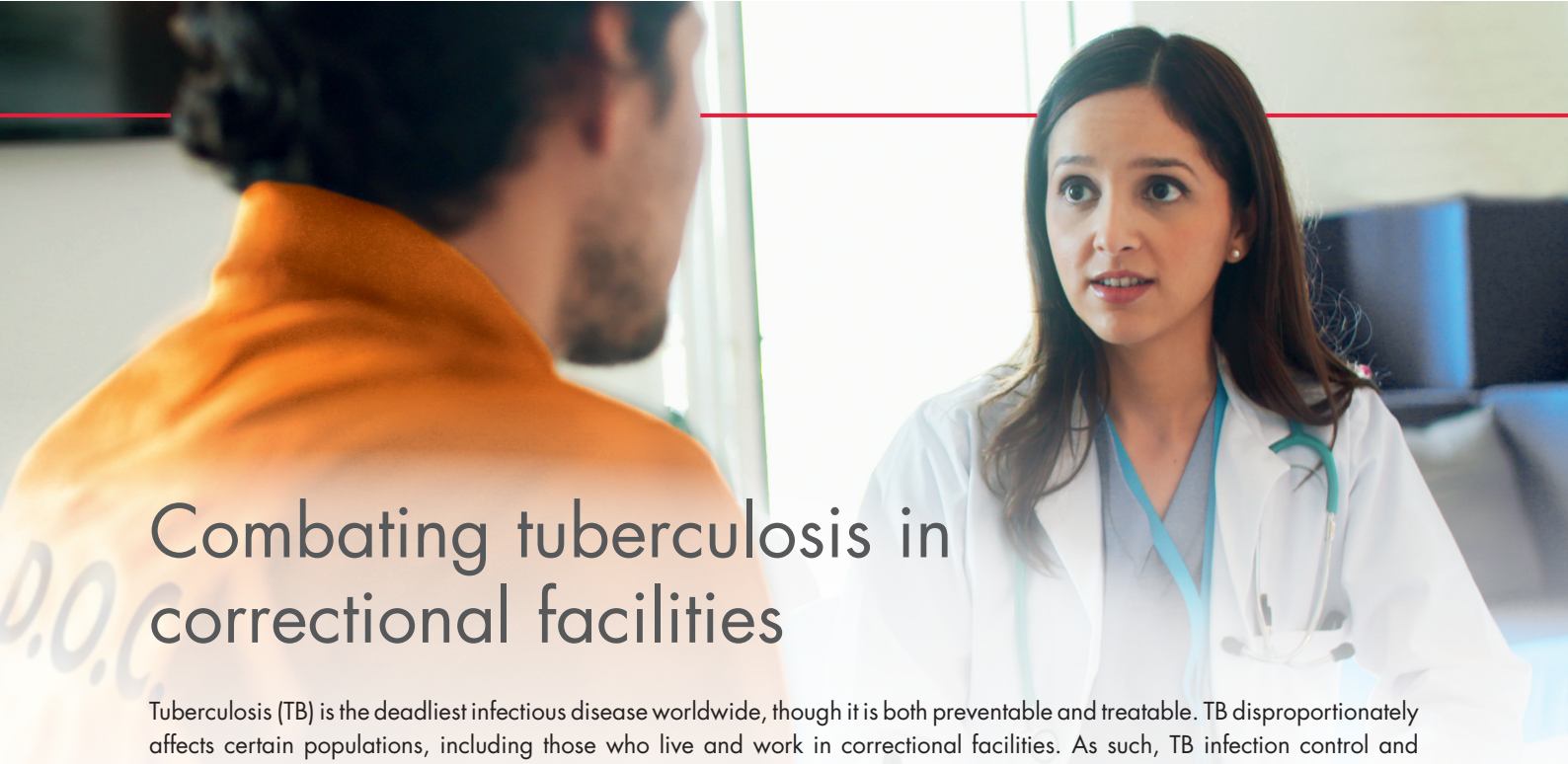


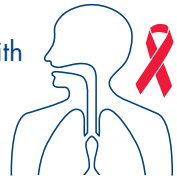
Combating tuberculosis in correctional facilities

Tuberculosis (TB) is the deadliest infectious disease worldwide, though it is both preventable and treatable. TB disproportionately affects certain populations, including those who live and work in correctional facilities. As such, TB infection control and prevention in these facilities remain a critical public health priority, and administrators have an important role to play through routine screenings and early treatment.

Tuberculosis is an airborne infection caused by bacteria called *Mycobacterium tuberculosis*. The Centers for Disease Control and Prevention (CDC) estimates that up to 13 million people in the US are infected with TB (1). Often, the infection remains dormant for weeks to decades in a state called latent TB infection (LTBI). This latent period may last months to decades. Left untreated, roughly 10% will go on to develop active TB disease in their lifetime (2). In its active form, TB is a life-threatening and contagious disease that kills 50% of its victims if left untreated.

The US Preventive Services Task Force recommends LTBI screening in high-risk populations, including those who currently or have previously lived in correctional facilities. While the prevalence of LTBI is approximately 5% of the general population in the US, it is often significantly higher among prisoners (3). In addition to living in a congregate setting, prisoners may carry additional risk factors for TB. Among total US TB cases, these factors include (2):

Co-infection with HIV **5.6%**



Homelessness **4.9%**

Substance/alcohol abuse **18.1%**

The CDC additionally recommends testing for correctional facility workers (4). Everyone working and living within correctional facilities shares a heightened risk of being infected and spreading the disease within facilities and into the local community. Facility conditions such as overcrowding, poor ventilation, and high turnover of inmates with short sentences (who are often discharged before they are screened) create amplified risk of transmission and outbreaks for correctional facility workers and their communities.

In the US, 86% of active TB cases result from longstanding, untreated LTBI, while just 14% of cases develop from recent transmission (2). As such, the best way to prevent TB is to detect LTBI in inmates and staff and treat the infection before it poses a threat. Additionally, LTBI treatment is far less costly and easier to manage than treatment for active TB disease which is complex, longer and more toxic.

"In correctional facilities, early TB detection and treatment of LTBI are key interventions to prevent TB outbreaks," says Dr. Masae Kawamura, Senior Director of Medical and Scientific Affairs at QIAGEN. "Evidence shows that the most effective tools and shorter yet safer regimens can transform efficiency and effectiveness in the correctional setting."

The CDC now recommends TB blood tests, known as interferon-gamma release assays (IGRAs) for most of the population, and "especially in persons with a history of Bacillus Calmette-Guérin (BCG) vaccination or for those who are unlikely to return to have their tuberculin skin test read (5)". This issue is particularly critical in correctional facilities because one of the biggest limitations of the skin test (TST) is that they require a follow-up visit 48–72 hours after the test is administered. Given that ~30% of inmates are released within this testing window, correctional facilities post high rates of incomplete TB skin tests (6).

Blood Test	Skin Test
One visit to the clinic	Two visits to the clinic
A small sample of blood is taken	Tuberculin is injected into the skin
Results are unaffected by the BCG vaccine	Results may be affected by the BCG vaccine
Results are determined in a laboratory	Results are determined by visual assessment by an expert
Results are objective and definitive	Results are subjective and variable

Fortunately, QuantiFERON®-TB Gold Plus, developed by QIAGEN, provides an IGRA-based testing solution that is more accurate in detecting LTBI than the traditional skin test. Several studies in the US have demonstrated that using an IGRA-based blood test in correctional settings can improve the operational efficiency of LTBI screening.

- In New York City jails, IGRA testing with QuantiFERON-TB Gold had significant programmatic impact by reducing incomplete LTBI screening rates from 28% (using the TST) to less than 4% with QuantiFERON-TB Gold (6).
- In a Texas jail setting, QuantiFERON-TB Gold was more time-efficient and less costly than the TST when used as an initial screening tool. The cost per LTBI case detected was nearly 3 times higher for TST than for QFT-GIT ($1247 v $460) –and was associated with four-fold lower labor costs and greater time efficiency (7). Investigators also documented that 28% of the inmates left jail before the TST could be read.

Correctional facilities have unique challenges in preventing TB and keeping inmates and workers safe and healthy, plus extending that health and safety into the local community. By requiring IGRA-based testing for all staff and residents as part of a broader infection-control plan, it is possible to efficiently and effectively prevent outbreaks of full-blown TB and exposure.

To learn more about correctional TB testing and QuantiFERON-TB Gold Plus, visit **www.QuantiFERON.com/corrections**.

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