

**CALIFORNIA'S PUBLIC HEALTH LABORATORIES PROTECT THE PUBLIC FROM
MYCOBACTERIAL DISEASE THROUGH A NETWORK UTILIZING RAPID LIQUID
CULTURE AND SUSCEPTIBILITY SYSTEMS INCLUDING A NEW ROBUST SECOND LINE
SUSCEPTIBILITY TESTING SYSTEM**

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California's diverse and large population (36 million) spread over a large and varied geographical area requires a network of 40 local county and city public health laboratories (PHLs) to provide for the public's protection. Tuberculosis including Multiple Drug Resistant (MDR) *M. tuberculosis* continues to be a major public health concern. While some cases are within the existing population, immigration from Mexico, Southeast Asia and the former Soviet Union continues to present challenges to California. During the past decade California revamped the tuberculosis control system to include greater involvement of local PHLs in initial diagnosis and susceptibility testing using rapid methods. All PHLs perform acid fast bacteria (AFB) smear analysis. 21 PHLs perform culture using media and 23 PHLs are performing liquid culture; 18 use the Becton Dickinson BACTEC MGIT 960 (MGIT) system with only 4 laboratories using the Biomerieux Bact/Alert system. The remaining laboratories participate in a regionalized "Rapid Liquid Culture in the Mail" program. Locally processed specimens are mailed to a central reference PHL where MGIT analysis is provided. Regarding susceptibility, 8 laboratories use media susceptibility, 7 use the BACTEC 460 and 11 use the MGIT system. The remaining susceptibility need is supplied using the regional "Rapid Liquid Culture in the Mail" MGIT system provided by a central laboratory: thus all laboratories have access to a MGIT system. The high usage of the MGIT system has allowed California to complete an internal study using second line drugs that determined the Minimal Inhibitory Concentration (MIC) using the H37Rv strain and then determined the critical concentrations ($\mu\text{g/mL}$) using 61 additional MRD strains and 88 clinical strains with subsequent inter-laboratory reproducibility has produced a MGIT 2nd line drug testing scheme for California. Critical concentrations determined are as follows Levofloxacin 1.5 $\mu\text{g/mL}$, Amikacin 1.5 $\mu\text{g/mL}$, Capreomycin 3.0 $\mu\text{g/mL}$, and Ethionamide 5.0 $\mu\text{g/mL}$.