Implementation of Rapid Mycobacterium and Nocardia identification utilizing BioMerieux Vitek® MS Matrix Assisted Laser Desorption Ionization Time of Flight (MALDI-TOF) into Houston's Mycobacteriology Workflow to Enhance Laboratory Productivity and Performance.

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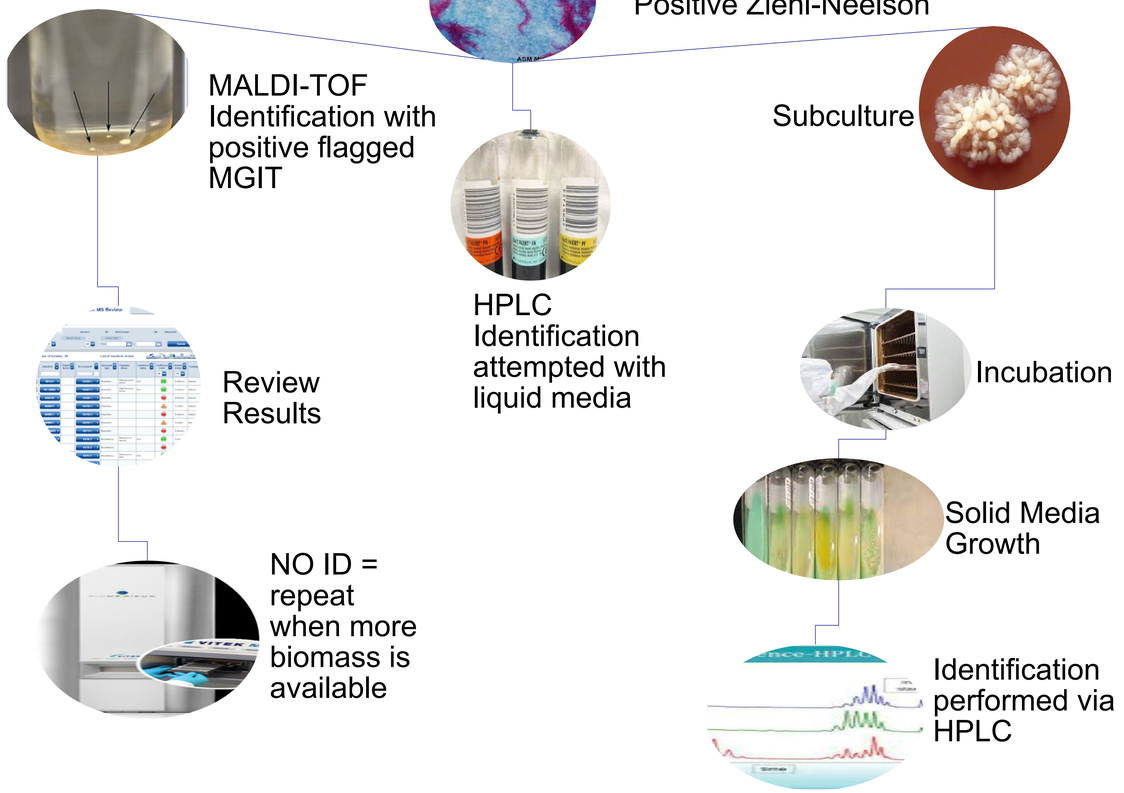
Introduction

The implementation of the BioMerieux Vitek® MS MALDI-TOF testing platform had a profoundly positive effect on workflow in the Mycobacteriology section at the Houston Health Department (HHD). Examination of laboratory productivity and performance occurred through analytical investigation of time and cost savings of MALDI-TOF compared to High performance Liquid Chromatography(HPLC).

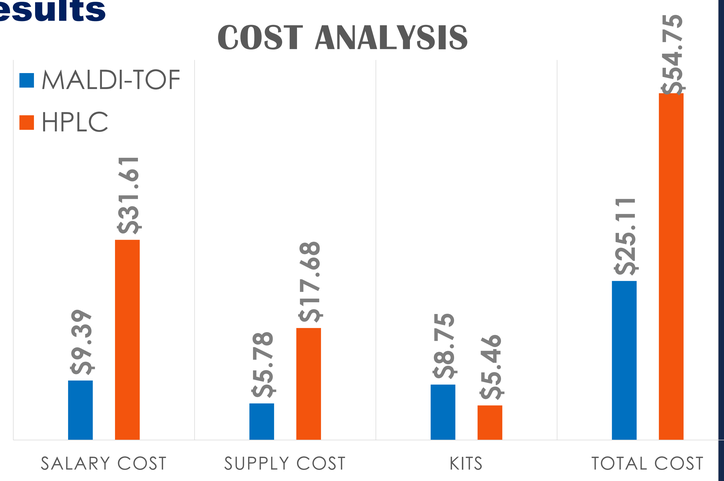
Study Design

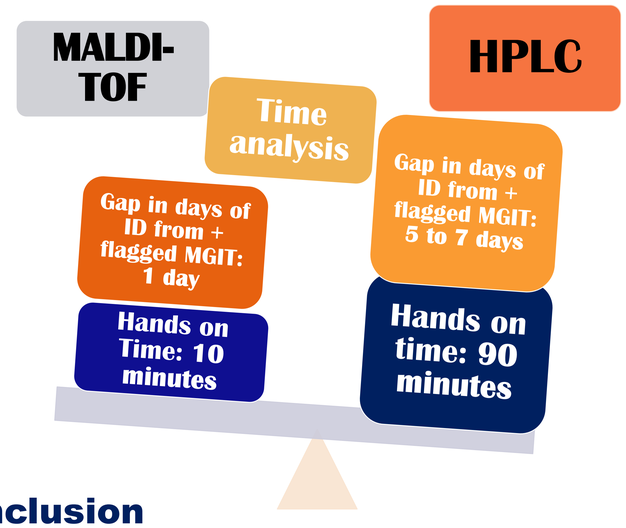
MALDI-TOF was implemented at HHD in two phases, Research Use Only (RUO) and In Vitro Diagnostics (IVD) that spanned four years. At the time of initial implementation in 2016, the test system was not FDA-approved for mycobacteria. Both implementation processes led to decreased turn-around times for identifications from weeks to days, enhanced epidemiological investigations during outbreak investigations, and allowed for improved patient care.

Prior to MALDI-TOF's implementation, HPLC was utilized for Mycobacterium identification. The antiquated conventional method was labor intensive, due to the time required to perform, costly, and difficult to interpret by the untrained eye leading to increased turnaround times (TAT), which was not conducive for timely case identification and treatment. MALDI-TOF provided the capability for early and accurate diagnosis by allowing identifications to be performed on positive broth with reduced labor, costs, and improved analysis.



Results





Conclusion

Productivity and performance measures significantly improved with the implementation of rapid identification of Mycobacterium and Nocardia species. MALDI-TOF's affordability, paired with the extreme identification speed and accuracy for mycobacterium, has drastically reduced testing times, improved laboratory efficiency, and reduced operational costs in the laboratory. The technology has allowed the laboratory to expand its capacity to deliver services that were previously not readily available in the City.