Overview of TB Diagnostic Challenges

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TB Situation In Pakistan

- Epidemic in Pakistan.
- Estimated 510,000 new TB cases each year.
- Approximately 15,000 develop drug-resistant TB cases every year.
- Ranked fifth among high-burden TB countries.
- Fourth highest prevalence of multidrug-resistant TB (MDR-TB) globally.
- Sixty-one % of the TB burden in the WHO Eastern Mediterranean Region.
Diagnostic Stewardship-Need of the Hour

- Appropriate use of laboratory testing to guide patient management.
- Optimize clinical outcomes and limit the spread of antimicrobial resistance.
Impact of Covid and war

- Disease exposure.
- Economic prioritization.
- Decreased social support.
- Psychological pressure due to quarantine and isolation has an increased risk for decreased mental and physical performance.
Significance of Sequencing

• Existing targeted molecular genotyping techniques (Xpert and LPA) are unable to detect all resistance mutations to Rifampicin and INH.

• Missed diagnosis of resistance

• Tests are also not able to detect resistance to MDR treatment drugs such as pyrazinamide, bedaquiline, or clofazimine.

• Phenotypic susceptibility testing (pDST) is mostly not available for newer anti-TB drugs in Pakistan
Significance of Sequencing

• Lack of training and infrastructure for genomic sequencing are currently hindering its effective implementation.

• Leading to the use of MDR treatment drugs without any susceptibility testing.
Significance of Sequencing

- Genome sequencing remains the only solution for identifying the full spectrum of resistance to anti-TB drugs.
- WHO recently endorsed the first “Catalogue of mutations in Mycobacterium tuberculosis complex and their association with drug resistance” to facilitate its application in routine diagnostics and resistance surveillance.
Significance of Sequencing

- Imperative that effective tools for DST to all drugs used in MDR TB treatment should be available to maintain their judicious use.

- Only possible by the use of appropriate diagnostic techniques, including genomic sequencing, to identify susceptibility or resistance with accuracy and precision.
Pain points of sequencing

- Biggest challenge _Resources._
- Budget/Funding for international training.
- Training of HR and consumables.
- Availability of experts for troubleshooting.
Collaborations with NRL Borstel

- Validation of 4 new TB drugs.
- Training at Borstel.
Thank You