

# Overview of TB Diagnostic Challenges

INDUS HOSPITAL & HEALTH NETWORK

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# TB Situation In Pakistan

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- 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

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

# Impact of Covid and war

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- 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

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- 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

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- 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

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- 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

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- 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

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- Biggest challenge **\_Resources**.
- Budget/Funding for international training.
- Training of HR and consumables.
- Availability of experts for troubleshooting.

# Collaborations with NRL Borstel

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

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**Thank You**

