The Global TB Epidemic

Facts:
- 9 million TB cases
- 1.5 million TB deaths
- 3 million undiagnosed
- Up to 30% of cases diagnosed never get treated

Facts:
- 480,000 with MDR
- 3.5% of new + 20.5% of previously treated TB cases
- Only 8.5% new + 17% prev. treated are diagnosed

MDR

Diagnosed Multi-drug resistant TB

Undiagnosed TB

Untreated TB

All cases of TB

Over-treatment

WHO Global TB report 2014
Existing Drug Susceptibility Testing

- **Phenotypic**
  - Long time to diagnosis
  - Complex, requiring high skill
  - Biosafety requirements

- **Genotypic**
  - Xpert: limited drug portfolio
  - LPA: Complex, requiring high skill

25 November 2014
Molecular Pipeline

High complexity assays

- Hain GenoType MTBDRplus
- Roche Cobas
- Abbott TBMDx
- Hain GenoType MTBDRsl
- Veredus Laboratories VereMTB™
- ZeeSan MoPro®
- Nipro LiPA PZA & MDR
- Hain LATE PCR Lights on Lights off MTB-PZA
- YD REBA MTB-XDR REBA MTB-Rifa
- BD BD Max
- Illumina Next-Generation Sequencing

Moderate complexity assays

- Cepheid Xpert® MTB/RIF
- iCubate
- Eiken TBLAMP™
- NanoBioSys LabChip G2-3
- Veredus Laboratories VereMTB™
- Cepheid Xpert® Ultra Xland-XDR
- ErigeneML® MDR TB
- Northwestern GHT/Quidel
- Ustar MTB
- Akkoni MDR-TB
- Alere™ Q
- MoBio Truelab/Truenat
- Epistem Genedrive®
- STAT-Diagnostica DiagCORE
- InSilixa HYDRA
- QuantumMDx Q-POC™

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<tr>
<th>WHO-endorsed</th>
<th>Limited commercial availability</th>
<th>In development</th>
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<td>2015</td>
<td>2016</td>
<td>2017</td>
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Our Vision
Convergence of Drugs with Diagnostics

STAND-trial for PaMZ

New regimens
New drugs

Molecular Test Development
The Approach
Two Step Approach

**FIRST Step**

- What do we know now?
- TPP development
- Identification of high confidence markers of resistance
- Inform developers of molecular tests

**SECOND Step**

- Enhance sequencing for surveillance
  - Country capacity strengthening
  - Integration of data in database
- Sequencing to directly inform patient care
  - Optimization of sample preparation for sequencing
  - Development of more automated solutions
Key principles

- High quality
- Divers data
- Collaborative
- Sustainable
- Open access

Database
The FIRST Step
• CPTR - a strong partner
  • With established capabilities in management of large amounts of data
  • With linkage to drug development
The Role of FIND/NDWG

To provide the coordination and communication with stakeholders in order to facilitate

- The data contributions to the database
- The common work towards enriching the data available
- The communication with test developers
- The linkage to WHO
The Role of FIND/NDWG

In partnership with lead experts in the field

• Ensure the quality of the data included in the database
• Drive the development of criteria for the validation of mutations that are associated with resistance
• Create a ‘living’ list of relevant resistance mutations
• Define algorithms for the interpretation of genotypic data and their correlation with clinically relevant resistance in *M. tuberculosis*. 
Thank you! Questions?

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