Results: MODS testing of 2932 TB patients determined that 381 (13%) had drug-resistant TB (DRTB; i.e. resistant to isoniazid, rifampicin or both), so 7.7 patients needed to have MODS culture per drug-resistant case identified (16 per MDR case). Drug resistance was more common among re-treatment cases (26%; risk ratio = 1.9, $P < 0.001$; population attributable fraction: 16%). Thus, restricting MODS testing to the 22% of TB patients who were re-treatment cases would only detect 35% of all DRTB (39% of MDR-TB). Additionally among 12 581 contacts, 1335 (11%) had respiratory symptoms, 113 of whom were MODS culture positive (i.e., 0.9% of all contacts and 8.5% of symptomatic contacts). Of these culture-positive contacts 39 (35%) were ZN microscopy-negative. Thus 34 symptomatic household contacts needed to have MODS culture per smear-negative TB case identified.

Conclusion: In operational settings, modern diagnostic tests that offer sensitive diagnosis and rapid DRTB testing may provide greatest public health impact when focused on TB patients rather than on enhanced case-finding. These calculations may be adjusted for settings with different rates of smear-negative TB and DRTB.

PC-101296-13 A simple colour test for diagnosing MDR-TB and XDR-TB under field conditions

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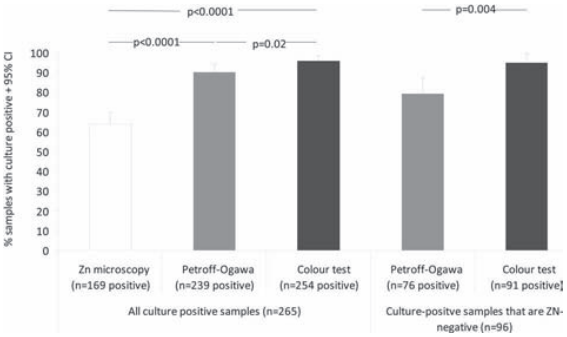
Background: Increasing rates of drug-resistant and smear-negative TB require improved TB diagnostics that are easy to use, affordable and equipment-minimal. The MDR/XDR-TB Colour Test is a simple, Thin-Layer-Agar-based non-proprietary culture technique that offers concurrent MDR testing and XDR screening. We compared its performance with a standard culture technique.

Methods: Sputum samples were collected from patients with suspected TB ($n = 788$). Smear microscopy was done directly from sputum samples, which subsequently underwent culture with the Peruvian standard protocol of modified-Petroff NaOH-decontamination and culture on Ogawa medium. Samples for the Colour Test were collected in parallel directly into sputum pots containing disinfectant that decontaminated the sputum in-transit. Upon arrival in the lab, these were directly applied to selective culture medium without any processing. Positive cultures were indicated by colour change.

Results: 265 samples had a culture-positive result and



both Colour Test and Petroff-Ogawa were significantly more sensitive than ZN microscopy (96% and 90% vs. 63%; $P < 0.0001$). The Colour Test also had higher sensitivity than Petroff-Ogawa ($P = 0.02$) and this difference was greatest in the 128 smear-negative samples that were culture-positive (95% vs. 79%; $P = 0.002$). Results were obtained more rapidly in the Colour Test (17 vs. 21 days; $P < 0.0001$) with similar contamination rates (3.5% vs. 2.4%; $P = 0.2$). The Colour Test detected drug-resistant TB in 18% of all culture-positive samples the same day as culture detection with 99% agreement with delayed indirect testing.

Conclusion: The Colour Test is a simple culture technique that offers superior characteristics over the current standard culture method. It addresses the rising challenges of paucibacillary disease and drug-resistance while using simple and effective technology that is appropriate to resource-poor settings where these problems are most common.

PC-100618-13 Rapid direct MDR-TB testing better predicts clinical outcome than conventional delayed testing

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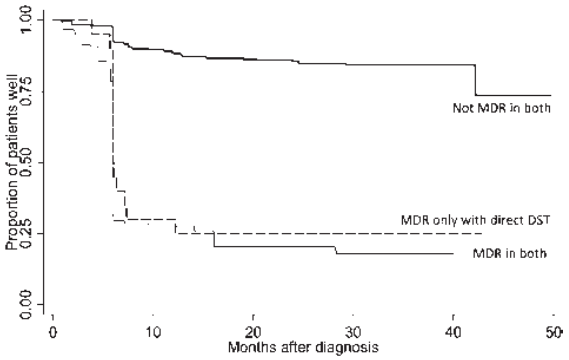
Background: Drug susceptibility testing (DST) is an important tool in the control of multidrug-resistant tuberculosis (MDR-TB). Conventional DST is done indirectly after first culturing the TB strain, thereby delaying the DST result. New DST tests are emerging that culture TB directly on antibiotic-containing media concurrently with drug-free culture. This leads to a much more rapid DST result, which may have an important positive impact on the patient's clinical outcome. Direct and indirect DST may have discrepant results and we therefore investigated the clinical

outcome of patients in relation to the agreement of results of both methods.
Methods: Direct and indirect DST was performed on the same sputum sample ($n = 2081$) and the data were then grouped according to the concordance of the results (both MDR, both not MDR or discrepant result). For each pair of results we obtained the data on the patients' clinical condition at the end of TB treatment and the cured patients were followed-up for the emergence of a new episode of TB. We compared the risk of having a bad clinical outcome (failure, death or recurrent TB) for each group.
Results: Direct and indirect DST had consistent results in 97% of samples. Patients with an MDR result in direct DST and a non-MDR result in indirect DST had a hazard ratio of 7.3 (95%CI 4.2–12.8) of having a bad clinical outcome compared to the patients with no evidence of MDR-TB. Patients found to be MDR in both methods had a hazard ratio of 2.9 (CI 95% 2.6–3.5) of having a bad clinical outcome compared to the patients with no evidence of MDR-TB.
Conclusion: Patients diagnosed with MDR-TB by direct DST but diagnosed to have non-MDR-TB by indirect DST had the highest risk of having a bad clinical outcome. Thus, these results of rapid direct DST had greater clinical significance than slower indirect DST.



PC-101139-13 Pyrazinamide susceptibility testing: comparison of MGIT assay with Wayne test and gene sequencing

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Aim: For the management of multidrug-resistant (MDR) tuberculosis, pyrazinamide (PZA) susceptibility testing of *Mycobacterium tuberculosis* is required for designing optimal regimen for treatment. To select an accurate and simple test, we accessed performances of a commercial BACTEC™ MGIT™ 960 PZA (MGIT) assay (Becton Dickinson, Sparks, MD, USA), the Wayne test and the pncA gene sequencing.
Methods: The commercial MGIT test was a liquid culture based method, the Wayne test was an enzymatic pyrazinamidase assay and mutation of the pncA gene sequencing were used to detect PZA resistance. A total of 196 MDR *M. tuberculosis* isolates were evaluated using three methods in parallel.
Results: Using the pncA gene sequencing as a gold standard method, our results indicated that the sensitivity, specificity and accuracy for the MGIT assay were 77.1%, 97.1% and 72.5%; while for the Wayne test were 96.8%, 100% and 98.5%, respectively. The turn-around-time (TAT) was 10 days for the MGIT assay, 7 for the Wayne test, and 3 for the pncA gene sequencing. In addition, for each isolate, the cost of the MGIT assay was 19 USD, the Wayne test 0.4, and the pncA gene sequencing 20.
Conclusion: The Wayne test showed better concordance with sequencing results in comparison with the MGIT assay. The Wayne test was recommended to be included in routine clinical services with the pncA gene sequencing as a supplement.

PC-101136-13 Influence of race/ethnicity in quantitative interferon-γ response

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Background: Interferon-γ release assays (IGRAs) have been recommended by national and international agencies for targeted screening of LTBI, though differences in elicited quantitative responses according to race/ethnicity have not been evaluated.
Design/methods: Clinical and laboratory data from patients referred to the San Francisco Department of Public Health Tuberculosis Control Clinic from March 2005 to February 2008 were reviewed. We excluded subjects with active or clinically inactive disease, HIV-infection, immunosuppressive conditions, or who were under 15 years of age. We used negative binomial regression with robust standard errors to model racial/ethnic differences in IFN-γ results obtained from Quantiferon TB-Gold, adjusting for age, gender, ATS/CDC/IDSA TB Classification, length of time in the United States, contact status, recent skin test placement, and homelessness.
Results: Of 1375 eligible subjects, 694 (50%) were Asian, 251 (18%) were White, 160 (12%) were Black, and 270 (20%) were Hispanic. Median IFN-γ levels varied significantly by race/ethnicity (Asian, 0.5 IU/ml (IQR 0.04–1.59); White, 0.11 IU/ml (IQR 0.01–0.87); Black, 0.57 IU/ml (IQR 0.01–4.54); Hispanic, 0.69 IU/ml (IQR 0.04–2.61); $P < 0.0001$). Among subjects with latent TB infection, Hispanics had higher adjusted mean IFN-γ levels compared to Asians (dif-