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307RAFEI, A.; PASHA, E.; ORAK, R. J. **Tuberculosis surveillance using a Hidden Markov Model.** *Iranian Journal of Public Health* (2012) **41** (10) 87-96 Tehran, Iran; School of Public Health and Institute of Public Health Research, Tehran University of Medical Sciences [En, 40 ref.] Dept. of Mathematics and Statistics, School of Health Management and Information Sciences, Tehran University of Medical Sciences, Tehran, Iran. Email: r-jamshidi@tums.ac.ir

BACKGROUND: Routinely collected data from tuberculosis surveillance system can be used to investigate and monitor the irregularities and abrupt changes of the disease incidence. We aimed at using a Hidden Markov Model in order to detect the abnormal states of pulmonary tuberculosis in Iran. **METHODS:** Data for this study were the weekly number of newly diagnosed cases with sputum smear-positive pulmonary tuberculosis reported between April 2005 and March 2011 throughout Iran. In order to detect the unusual states of the disease, two Hidden Markov Models were applied to the data with and without seasonal trends as baselines. Consequently, the best model was selected and compared with the results of Serfling epidemic threshold which is typically used in the surveillance of infectious diseases. **RESULTS:** Both adjusted R-squared and Bayesian Information Criterion (BIC) reflected better goodness-of-fit for the model with seasonal trends (0.72 and -1336.66, respectively) than the model without seasonality (0.56 and -1386.75). Moreover, according to the Serfling epidemic threshold,

higher values of sensitivity and specificity suggest a higher validity for the seasonal model (0.87 and 0.94, respectively) than model without seasonality (0.73 and 0.68, respectively). **CONCLUSION:** A two-state Hidden Markov Model along with a seasonal trend as a function of the model parameters provides an effective warning system for the surveillance of tuberculosis.

308 CHANG KWOKCHIU; LEUNG CHICHIU; YEW WINGWAI; LEUNG CHUNGCHING [LEUNG, C. E.]; LEUNG WAIMAN; TAM CHEUKMING; ZHANG, Y. **Pyrazinamide may improve fluoroquinolone-based treatment of multidrug-resistant tuberculosis.** *Antimicrobial Agents and Chemotherapy* (2012) **56** (11) 5465-5475 Washington, USA; American Society for Microbiology (ASM) [En, 44 ref.]

The role of pyrazinamide in the current treatment of multidrug-resistant (MDR) tuberculosis (TB) is uncertain. From a territory-wide registry of MDR-TB cases diagnosed between 1995 and 2009, we assembled a cohort of 194 patients with MDR pulmonary TB given fluoroquinolone-containing regimens. Stratified by pyrazinamide use and susceptibility, there were 83 users with pyrazinamide-susceptible MDR-TB (subgroup A), 24 users with pyrazinamide-resistant MDR-TB (subgroup B), 40 nonusers with pyrazinamide-susceptible MDR-TB (subgroup C), and 47 nonusers with pyrazinamide-resistant MDR-TB (subgroup D). We estimated the adjusted risk ratio (ARR) of early sputum culture conversion (ARR-culture) that occurred within 90 days

posttreatment and that of cure or treatment completion (ARR-success) that occurred by 2 years posttreatment due to pyrazinamide use with susceptibility. In comparison with subgroup B, ARR-culture and ARR-success were 1.38 (95% confidence interval [CI], 0.89 to 2.12) and 1.38 (95% confidence interval [CI], 0.88 to 2.17), respectively. Corresponding findings were 0.99 (95% CI, 0.81 to 1.22) and .0.99 (95% CI, 0.78 to 1.26) in comparison with subgroup C and 1.09 (95% CI, 0.84 to 1.42) and 0.94 (95% CI, 0.74 to 1.20) in comparison with subgroup D. Early culture conversion significantly increased the incidence proportion of cure or treatment completion by 71% (95% CI, 26% to 133%). Selection bias among pyrazinamide nonusers might have underestimated the role of pyrazinamide. Comparison of pyrazinamide users showed that pyrazinamide increased the incidence proportion of early culture conversion and that of cure or treatment completion by a best estimate of 38% for both. This magnitude of change exceeded the 15 to 20% increase in the 2-month culture conversion rate of drug-susceptible TB that results from adding pyrazinamide to isoniazid and rifampin. Pyrazinamide is likely important in fluoroquinolone-based treatment of MDR-TB.

309 DEETLEFS, E.; EPSTEIN, D.; WATERMEYER, G. A.; SEGGIE, R. M.; THOMSON, S. R. **Tuberculosis in an inflammatory bowel disease cohort from South Africa.** *SAMJ - South African Medical Journal* (2012) **102** (10) 802-804 Pretoria, South Africa; SAMA Health and Medical Publishing Group [En, 16 ref.] Division of Gastroenterology, Department of Medicine, University of Cape Town and Groote Schuur Hospital, Cape Town, South Africa. Email: eduan@gidoc.co.za

BACKGROUND: Potent immunosuppressive therapy is standard treatment for inflammatory bowel disease (IBD) but carries a risk of reactivating latent tuberculosis (TB). No data exist on

the burden of TB in South African patients with IBD. **OBJECTIVE:** To evaluate the burden of TB in IBD patients attending a large tertiary IBD clinic. **METHODS:** A retrospective analysis was performed on data pertaining to patients attending the Groote Schuur Hospital IBD clinic. Data were extracted from an existing IBD database, patient notes, the National Health Laboratory Services database and chest X-ray analysis. **RESULTS:** Of 614 patients, 72 (11.7%) were diagnosed with TB; 40 (55.6%) developed TB prior to the diagnosis of IBD. On regression analysis, coloured IBD patients were at increased risk for TB development ($p=0.004$, odds ratio (OR) 3.57, 95% confidence interval (CI) 1.49-8.56), as were patients with extensive Crohn's disease (CD) compared with those with less extensive disease ($p=0.001$, OR 2.84, 95% CI 1.27-6.33). No other risk factors, including the use of immunosuppressive agents, were identified for the development of TB. **CONCLUSIONS:** Of over 600 patients, 12% had TB either before or after IBD diagnosis. The high rate of previous TB and positive association with ethnicity probably reflects the high burden of TB in a socio-economically disadvantaged community. We recommend that IBD patients should be screened actively and monitored for TB when immunosuppressive medications are used.

310 OLIVEIRA, G. P. DE; PINHEIRO, R. S.; COELI, C. M.; BARREIRA, D.; CODENOITI, S. B. **Mortality information system for identifying underreported cases of tuberculosis in Brazil.** *Revista Brasileira de Epidemiologia* (2012) **15** (3) 468-477 Rio de Janeiro, Brazil; Associação Brasileira de Pós-Graduação em Saúde Coletiva [En, pl, 36 ref.] Instituto de Estudos em Saúde Coletiva da Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil. Email: giselepoliveira@gmail.com

The aim of the study was to analyze the underreporting of deaths from tuberculosis (TB) in Brazil, as well as to assess the impact these

cases would cause in the reporting rate and proportion of TB deaths in 2006. We analyzed the deaths recorded in the Mortality Information System (SIM) in 2006 and all reports of TB in Brazil during the 2001 to 2006 period. The variables used for the relationship were: report number, city and State of residence, patient name, date and year of birth, sex, mother's name and address. Six blocking steps were performed. Scores above 12.4 were considered pairs, and those below 9.7, doubtful pairs. After each step, we performed a manual review of doubtful pairs. The Reportable Disease Information System (Sinan) had 547,589 records. The SIM had 6,924 records, 39.3% (n=2,727) of which were not found in Sinan during the period evaluated. We observed that 64.5% (2,707) of deaths were reported in 2006 and after analyzing the proportion of deaths underreported by region and federal units, we found that the highest percentage was in the Northern region, followed by the Southeast and Northeast. The addition of deaths that had not been reported to the Sinan database increased the reporting rate 3.7%. Regarding the proportion of deaths due to TB, such inclusion was responsible for a 60.7% increase in this indicator. The relationship between both databases seems to be an important strategy for improving the quality of the TB surveillance system.

311 FERREIRA, S.M.B.; IGNOITI, E.; GAMBÁ, M. A. **Clinical and laboratory characteristics in the retreatment of leprosy relapse.** *Revista Brasileira de Epidemiologia* (2012) **15** (3) 573-581 Rio de Janeiro, Brazil; Associação Brasileira de Pós-Graduação em Saúde Coletiva [En, pl, 37 ref.] Faculdade de Enfermagem, Universidade de Cuiabá, Cuiabá, MT, Brazil. Email: jffbenev@terra.com.br

OBJECTIVE: To compare clinical and laboratory data of leprosy patients diagnosed in specialized services in the State of Mato Grosso, Brazil, during the initial treatment and the retreatment of

relapse. METHODS: A cross-sectional study of patients with diagnosis of leprosy relapse was conducted in specialized health services of five cities, between 2005 and 2007. Initial treatment was described as t1 and relapse treatment as t2. DATA SOURCE: *Sistema de Informação de Agravos de Notificação* (Sinan - Reportable Diseases Information System), medical records, laboratory tests, and files of individual reports and of physical disability assessments. The chi-square test (χ^2) was applied at a significance level of 5%. RESULTS: The clinical dimorphic form prevailed in t2 when compared with t1 (39.6% versus 11.3%; $p=0.003$); 20.8% of relapse cases showed a bacilloscopy index $\geq 4+$ in relation to those in [t1 ($p=0.034$)]; an increase in the number of (17%) cases of relapse with physical disability at level 0 was found, compared to patients evaluated during the diagnosis (58.5% versus 41.5%); an increase (7.5%) in the recurrence of disabilities at level 2 was observed, when compared to t1 (9.4% versus 9%); and there was a higher prevalence of cases not evaluated for disability between t1 (45.3%) and t2 (22.6%) ($p=0.040$). CONCLUSION: Cases of relapse characterized the aggravation of the disease, indicated by the increase in the bacilloscopy index and level of physical disability. Attention should be paid to the diagnostic confirmation of relapse using bacilloscopy tests, especially in multi-bacillary cases, and systematic neurological assessment of all leprosy patients.

312 JANOLS, H.; ABATE, E.; IDH, J.; SENBETO, M.; BRITTON, S.; SHITA YE ALEMU; ABRAHAM ASEFFA; STENDAHL, O.; SCHON, T. **Early treatment response evaluated by a clinical scoring system correlates with the prognosis of pulmonary tuberculosis patients in Ethiopia: a prospective follow-up study.** *Scandinavian Journal of Infectious Diseases* (2012) **44** (11) 828-834 Stockholm, Sweden; Informa Healthcare [En] Department of Clinical Sciences, Section for Infectious Diseases, Skane University Hospital,

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BACKGROUND: In resource-limited settings the monitoring of tuberculosis (TB) patients is challenging, and early identification of TB patients with a high mortality risk is important. The aim of this study was to investigate prospectively whether early changes in a clinical scoring system (TB score) can predict treatment outcome in Ethiopian patients with pulmonary tuberculosis. **METHOD:** TB patients ($n=250$) and blood donors ($n=82$) were recruited prospectively at Gondar University Hospital, Ethiopia. Clinical scoring was performed using an interview-based questionnaire and clinical examination. **RESULTS:** Among TB patients (53.6% of whom were HIV co-infected) the median TB score declined from week 0 to week 2 (8 (interquartile range (IQR) 6-9) vs 4 (IQR 2-6)) and dropped to a low level at week 8, which was still significantly higher than that found in blood donors (2 (IQR 1-4) vs 0 (IQR 0-1), $p<0.0001$). Patients who died had a significantly higher TB score at week 0, week 2, and week 8 than survivors. Mortality was associated with a failure to achieve a decrease greater than 25% in the TB score at 2 weeks. Baseline CD4+ cell counts (<200 cells/mm³) were associated with mortality but not with initial TB score results. **CONCLUSIONS:** The TB score was increased during the first 2 months of treatment among patients who died. Failure to achieve a greater than 25% decrease in TB score after 2 weeks of treatment was associated with increased mortality. Repeated clinical scoring during the intensive phase of TB treatment could be useful to identify high-risk patients.

313 CHE YANG; YU MEI; JI WEI
[Application of variable number tandem repeats in genotyping of *Mycobacterium tuberculosis* strains in Ningbo.] *Disease Surveillance* (2012) **27** (7) 569-572 Beijing, China; Editorial Board of Disease Surveillance [Ch, en, 11 ref.] Ningbo Municipal Center for Disease Control and

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OBJECTIVE: To conduct genotyping of *Mycobacterium tuberculosis* strains isolated from the patients in Ningbo with a new method based on the variable number tandem repeats (VNTR). **METHODS:** Seven VNTR loci were selected and the polymorphism of DNA fingerprinting of *M. tuberculosis* was analyzed with polymerase chain reaction (PCR) and agarose gel electrophoresis. **RESULTS:** The 7 VNTR loci of 138 *M. tuberculosis* strains were detected, and 7 clusters and 123 distinct patterns were found. The HGI value of VNTR-7 was 0.9991, and the percentage of VNTR-7 was 5.8%. The VNTR-3820 loci had the polymorphism. **CONCLUSION:** The polymorphism of the *M. tuberculosis* isolates was obvious in Ningbo. The method of VNTR-7 showed high discrimination power in the detection of *M. tuberculosis*, which is easy to use and suitable for the TB control program.

314 MAURYA, A. K.; KANT, S.; NAG, V. L.; KUSHWAHA, R. AS.; DHOLE, T. N. **Trends of anti-tuberculosis drug resistance pattern in new cases and previously treated cases of extra-pulmonary tuberculosis cases in referral hospitals in northern India.** *Journal of Postgraduate Medicine* (2012) **58** (3) 185-189 Mumbai, India; Medknow Publications [En, 30 ref.] Department of Pulmonary Medicine, Chhatrapati Shahuji Maharaj Medical University, (Erstwhile King George Medical College), Lucknow, Uttar Pradesh, India.

BACKGROUND: Drug-resistant tuberculosis is one of major current challenges to global public health. The transmission of resistant strains is increasing as a burden of multidrug-resistant tuberculosis (MDR-TB) patients in extra pulmonary tuberculosis (EPTB) cases in India. **AIM AND OBJECTIVES:** The aim was to study trends of anti-tuberculosis drug resistance pattern in new cases and previously treated cases of EPTB in referral hospitals in northern India. **STUDY DESIGN AND**

SETTING: A prospectively observational study and referral medical institutions in northern India. MATERIALS AND METHODS: All EPTB specimens were processed for Ziehl Neelsen staining, BACTEC culture and BACTEC NAP test for *Mycobacterium tuberculosis* complex. All *M. tuberculosis* complex isolates were performed for radiometric-based drug susceptibility pattern against streptomycin, isoniazid, rifampicin and ethambutol using the 1% proportion method. RESULTS: We found that 165/156 (20.5%) isolates were identified as *M. tuberculosis* complex by the NAP test. We observed that 39.9% were resistant to first-line antitubercular drugs. The resistance rate was higher in previously treated patients: H (30.3%), R (16.3%), E (15.7%) and S (16.3%). MDR-TB was observed in 13.4%, but, in new cases, this was 11.4% and 19.1% of the previously treated patients ($P < 0.05$). CONCLUSION: MDR-TB is gradually increased in EPTB cases and predominant resistance to previous treated cases of EPTB. The molecular drug sensitivity test (DST) method can be an early decision for chemotherapy in MDR-TB patients. The International Standards of TB Care need to be used by the RNTCP and professional medical associations as a tool to improve TB care in the country.

315 LIN HSIENHO; DOWDY, D.; DYE, C.; MURRAY, M.; COHEN, T. **The impact of new tuberculosis diagnostics on transmission: why context matters.** *Bulletin of the World Health Organization* (2012) **90** (10) 739-747 Geneva, Switzerland; World Health Organization [En, ar, ch, fr, ru, es, 36 ref.] Institute of Epidemiology and Preventive Medicine, National Taiwan University, 17 Xuzhou Road, 100 Taipei, Taiwan. Email: hsienho@ntu.edu.tw

OBJECTIVE: To estimate the impact of new tuberculosis diagnostics on tuberculosis transmission given the complex contextual factors that can lead to patient loss before diagnosis or treatment. METHODS: An epidemic model of tuberculosis specifying discrete steps along the

tuberculosis diagnostic pathway was constructed. The model was calibrated to the epidemiology of tuberculosis and human immunodeficiency virus (HIV) infection in the United Republic of Tanzania and was used to assess the impact of a new diagnostic tool with 70% sensitivity for smear-negative pulmonary tuberculosis. The influence of contextual factors on the projected epidemic impact of the new diagnostic tool over the decade following introduction was explored. FINDINGS: With the use of smear microscopy, the incidence of tuberculosis will decline by an average of 3.94% per year. If the new tool is added, incidence will decline by an annual 4.25%. This represents an absolute change of 0.31 percentage points (95% confidence interval: 0.04-0.42). However, the annual decline in transmission with use of the new tool is -less when existing strategies for the diagnosis of smear-negative cases have high sensitivity and when symptomatic individuals delay in seeking care. Other influential contextual factors include access to tuberculosis care, patient loss before diagnosis, initial patient default after diagnosis and treatment success rate. CONCLUSION: When implementing and scaling up the use of a new diagnostic tool, the operational context in which diagnosis and treatment take place needs to be considered.

316 ROBABL, H.; NAVIDIAN, A; MOFRAD, Z. P. **[Quality of life of patients with pulmonary tuberculosis during treatment course.]** *Journal of Mazandaran University of Medical Sciences* (2012) **22** (93) Pe12-Pe122, En111 Sari, Iran; Mazandaran University of Medical Sciences [pe, en, 27 ref.] Department of Nursing, Faculty of Nursing and Midwifery, Zahedan University of Medical Sciences, Zahedan, Iran. Email: alinavidian@gmail.com

BACKGROUND AND PURPOSE: One of the factors affecting quality of life is health and illness. Including diseases that affect quality of life is tuberculosis. This study was done in order to

evaluated quality of life patients with pulmonary tuberculosis during treatment course. MATERIALS AND METHODS: This study is a cross-sectional study that was done in 1390 on 50 patients with pulmonary tuberculosis covered by health centers in Zahedan during three stage of treatment (beginning of treatment, end of attack stage, end of maintenance phase). Samples were chosen to participate in the study by accessible sampling. TBQOL-Version 2 was used to data collection. Data were analyzed by correlation coefficient, independent t, and ANOV A tests. RESULTS: The majority of subjects (68%) were Female with mean age of 58.60 ± 17.50 years. Results showed that the mean overall quality of life scores of 66.6 at the beginning of treatment to 92.4 at the end of attack stage and 102.5 in the end of maintenance phase is increased (maximum score was 120). Also finding showed significant increases in quality of life scores in physical, psychological, functional, environment and spiritual dimensions during three stages of treatment but significant increases in mean score on the social and family health were not observed. CONCLUSION: In addition, treatment of pulmonary tuberculosis control disease and reduce of symptoms, it can promote quality of life patients particularly in physical, psychological, functional, environment and spiritual dimensions. Thus the importance of complete treatment for tuberculosis should be emphasized more than before.

317 PARK JIYOUNG; KWON KITAE [Clinical usefulness of *rpoR* gene sequence analysis in lymph node tuberculosis.] *Infection and Chemotherapy* (2012) **44** (5) 357-361 Seoul, Korea Republic; Korean Society of Infectious Diseases and Korean Society of Chemotherapy [Ko, en, 17 ref.] Department of Pathology, Kyungpook National University, School of Medicine, Daegu, Korea Republic. Email: ktkwon@fatima.or.kr

BACKGROUND: Lymph node tuberculosis (LN-TB),

the most common extra-pulmonary tuberculosis, frequently shows a paradoxical response (PR) during treatment. Differential diagnosis between PR and treatment failure in LN-TB is a challenging task because drug susceptibility test (DST) is rarely performed and can be delayed due to low culture yield and a long process. The *rpoB* gene mutation analysis is a rapid method for detection of rifampin resistance, however, its clinical usefulness has not yet been evaluated in LN-TB. MATERIALS AND METHODS: DNA extracts from LN with *Mycobacterium tuberculosis* polymerase chain reaction (MTB-PCR) positive were gathered and direct sequencing of *rpoB* gene was performed. A retrospective review of clinical and microbiologic data was performed. To evaluate the clinical usefulness of *rpoB* gene analysis in LN-TB, the change to a second line anti-tuberculosis regimen was used due to insufficient rifampin DST data. RESULTS: A total of 21 DNA extracts from 25 LN-TB patients were enrolled. Three *rpoB* mutations (Asp516Tyr, Ser522Leu, and Ser522Ala) were observed; the Asp516Tyr mutation showed rifampin resistance, however, the DST data were not available for the other two mutations. Compared with the change to the second line regimen, the sensitivity and specificity of *rpoB* gene mutation analysis were 50% and 94.4%, respectively, in 20 available cases. Compared with the change to the second line regimen, the sensitivity and specificity of the *rpoB* gene mutation analysis were 100% and 100%, respectively, in nine available cases with PRo. CONCLUSIONS: Despite development of PR, keeping the first line regimen in LNTB cases without *rpoB* gene mutations may be reconun-ended. Conduct of a prospective, well designed, further study with a larger scale is warranted.

687 SCOTT, V.; AZEVEDO, Y.; CALDWELL, J. Improving access and quality of care in a TB control programme. *SAMJ - South African Medical Journal* (2012) **102** (11) 837-840 Pretoria, South Africa; SAMA Health and Medical

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OBJECTIVES: To use a quality improvement approach to improve access to and quality of tuberculosis (TB) diagnosis and care in Cape Town. **METHODS:** Five HIV/AIDS/sexually transmitted infections/TB (HAST) evaluations were conducted from 2008 to 2010 with interviews with 99 facility managers and a folder review of over 850 client records per evaluation cycle. The data were used in a local quality improvement process: sub-district workshops identified key weaknesses and facility managers drew up action plans. Lessons learnt and successful strategies were shared at quarterly district-wide HIV/TB meetings. **RESULTS:** Geographical access was good, but there were delays in treatment commencement times. Access for high-risk clients improved significantly with intensified TB case finding made routine in both the HIV counselling and testing and antiretroviral treatment (ART) services ($p < 0.01$ for both). Access for children in contact with an infectious case has improved but is still low (42% investigated and treated). Quality of care was mostly high at baseline (adherence to treatment protocols 95%). Measurement of body mass index improved from 20% to 62%. The assessment of contraception improved from 27% to 58%. Care for co-infected clients showed improved use of customised HIV stationery and increased assessment for ART eligibility. **CONCLUSIONS:** The HAST audit contributed to the improved TB cure rates by supplementing routine information and involving sub-district managers, facility managers and facility staff in a quality improvement process that identified local opportunities for programme strengthening.

688 LAWN, S. D.; HARRIES, A. D.; MEINTJES, G.; GETAHUN, H.; HAVLIR, D. Y.; WOOD, R.

Reducing deaths from tuberculosis in antiretroviral treatment programmes in sub-Saharan Africa. *AIDS* (2012) **26** (17) 2121-2133 Hagerstown, USA; Lippincott Williams & Wilkins, Inc. [En, 130 ref] The Desmond Tutu HIV Centre, Institute for Infectious Disease and Molecular Medicine Faculty of Health Sciences, University of Cape Town, Anzio Road: Observatory 7925, Cape Town, South Africa. Email: stevelawn@yahoo.co.uk

Mortality rates are high in antiretroviral therapy (ART) programmes in sub-Saharan Africa, especially during the first few months of treatment. Tuberculosis (TB) has been identified as a major underlying cause. Under routine programme conditions, between 5 and 40% of adult patients enrolling in ART services have a baseline diagnosis of TB. There is also a high TB incidence during the first few months of ART (much of which is prevalent disease missed by baseline screening) and long-term rates remain several-folds higher than background. We identify three groups of patients entering ART programmes for which different interventions are required to reduce TB-related deaths. First, diagnostic screening is needed in patients who have undiagnosed active TB so that timely anti-TB treatment can be started. This may be greatly facilitated by new diagnostic assays such as the Xpert MTB/RIF assay. Second, patients with a diagnosis of active TB need optimized case management, which includes early initiation of ART (with timing now defined by randomized controlled trials), trimethoprim-sulphamethoxazole prophylaxis and treatment of comorbidity. Third, all remaining patients who are TB-free at enrolment have high ongoing risk of developing TB and require preventive interventions, including optimized immune recovery (with ART ideally started early in the course of HIV infection), isoniazid preventive therapy and infection control to reduce infection risk. Further specific measures are needed to address multidrug resistant TB

(MDR-TB). Finally, scale-up of all these interventions requires nationally and locally tailored models of care that are patient-centred and provide integrated healthcare delivery for TB, HIV and other comorbidities.

689 HOUBEN, R M. G. J.; GLYNN, J. R.; MBOMA, S.; MZEMBA, T.; MWAUNGULU, N. J.; MWAUNGULU, L.; MWENIBABU, M.; MPUNGA, J.; FRENCH, N.; CRAMPIN, A. C. **The impact of HIV and ART on recurrent tuberculosis in a sub-Saharan setting.** *AIDS* (2012) **26** (17) 2233-2239 Hagerstown, USA; Lippincott Williams & Wilkins, Inc. [En, 17 ref] Karonga Prevention Study, Chilumba Malawi. Email: rein.houben@lshtm.ac.uk

OBJECTIVE: To estimate the impact of anti-retroviral therapy (ART) on the Incidence of recurrent tuberculosis (TB) in an African population. DESIGN: A long-term population cohort in Karonga District, northern Malawi. METHODS: Patients who had completed, treatment for laboratory-confirmed TB diagnosed since 1996 were visited annually to record vital status, ART use and screen for TB. Survival analysis estimated the effect of HIV/ART status at completion of treatment on mortality and recurrence. Analyses were stratified by time since treatment completion to estimate the effects on relapse (predominates during first year) and reinfection disease (predominates later). RESULTS: Among 1133 index TB cases contributing 4353 person-years of follow-up, there were 307 deaths and 103 laboratory-confirmed recurrences (recurrence rate 4.6 per 100 person-years). Half the recurrences occurred in the first year since completing treatment. HIV infection increased the recurrence rate [rate ratio adjusted for age, sex, period and TB type 2.69, 95% confidence interval (CI) 1.69-4.26], but with less effect in the first year (adjusted rate ratio 1.71, 95% CI 0.87-3.35) than subsequently (adjusted rate ratio 4.2, 95% CI 2.16-8.15). Recurrence rates on ART were intermediate between those of HIV-negative

individuals and HIV-positive individuals without ART. Compared with HIV-positive individuals without ART, the adjusted rate ratio was 0.74 (95% CI 0.27-2.06) in the first year, and 0.43 (95% CI 0.11-1.73) later. CONCLUSION: The increased incidence of TB recurrence observed in HIV-positive patients appeared to be reduced by ART. The effects are mostly on later (likely reinfection) disease so the impact of ART on reducing recurrence will be highest in high TB incidence settings.

690 ZHANG ZEHUA; LI LITAO; LUO FEI; CHENG PENG; WU FENG; WU ZHENG; HOU TIANYONG; ZHONG MIN; XU JIANZHONG. **Rapid and accurate detection of RMP- and INH-resistant *Mycobacterium tuberculosis* in spinal tuberculosis specimens by CapitalBio™ DNA microarray: a prospective validation study.** *BMC Infectious Diseases* (2012) **12** (303) (14 November 2012) London, UK; BioMed Central Ltd [En, 16 ref] Department of Orthopaedics, Southwest Hospital, Third Military Medical University, Chongqing, China. Email: zhangzehuattmmu@yahoo.com.cn, lltop_1@sina.com, luofly1009@21cn.com, chengpeng1117@163.com, hotbayer@hotmail.com, happywz@sina.com, tianyonghou@126.com, zhongmin188@sina.com, xjzslw@163.com

BACKGROUND: DNA micro arrays can detect tuberculosis and its multi-drug resistant form in *M. tuberculosis* isolates and sputum specimens with high sensitivity and specificity. However, no performance data currently exists for its use in spinal tuberculosis specimens. This study was aimed to assess the performance of the CapitalBio™ DNA microarray in the detection of isoniazid (INH) and rifampicin (RMP) resistance in spinal tuberculosis compared with the BACT/MGIT 960 system. METHODS: From March 2009 to December 2011, 153 consecutive patients from Southwest Hospital, Chongqing with clinically and pathologically diagnosed spinal tuberculosis were enrolled into this study.

Specimens collected during surgery from the tuberculosis patients were subjected to *M. tuberculosis* species identification and drug-resistance detection by the CapitalBio™ DNA microarray, and results were compared with those obtained from the absolute concentration drug susceptibility testing. RESULTS: The CapitalBio™ DNA micro array achieved 93.55% sensitivity for the correct *M. tuberculosis* species identification of the 93 specimens that tested positive for spinal tuberculosis through culture. In addition, twenty-seven additional patients (45.0%) were detected by the DNA microarray to be positive for *M. tuberculosis* among sixty spinal tuberculosis patients who were culture negative. Moreover, the DNA microarray had a sensitivity of 88.9% and a specificity of 90.7% for RMP resistance, and the microarray had a sensitivity of 80.0% and a specificity of 91.0% for INH resistance. The mean turn-around time of *M. tuberculosis* species identification and drug resistance detection using the DNA microarray was 5.8 (range, 4-9) hours. CONCLUSIONS: The CapitalBio™ DNA microarray is a feasible and accurate tool for the species identification of *M. tuberculosis* and for directly detecting RMP and INH resistance from spinal tuberculosis specimens in fewer than 9 hours.

691 AMANCIO, F. F.; LAMBERTUCCI, J. R.; COTA, G. F.; ANTUNES, C. M. **Predictors of the short- and long-term survival of HIV-infected patients admitted to a Brazilian intensive care unit.** *International Journal of STD & AIDS* (2012) **23** (10) 692-697 London, UK; Royal Society of Medicine Press Limited [En, 34 ref] Infectious Diseases Branch, Department of Internal Medicine, Faculdade de Medicina, Universidade Federal de Minas Gerais, Avenida Alfredo Balena, 190 Belo Horizonte, Minas Gerais, Brazil. Email: manzoff@gmail.com

The outcomes of HIV-infected patients requiring critical care have improved. However, in developing countries, information about HIV-infected

patients admitted to intensive care units (ICUs) is scarce. We describe the prognosis of HIV-infected patients admitted to a Brazilian ICU and the factors predictive of short- and long-term survival. A historical cohort study, including HIV-infected patients admitted to a Brazilian ICU at an HIV/AIDS reference hospital, was conducted. Survivors were followed up for 24 months after ICU discharge. Demographic, clinical and laboratory data, disease severity scores and mortality were evaluated. Data were analysed using survival and regression models. One hundred and twenty-five patients were studied. In-ICU and in-hospital mortality rates were 46.4% and 68.0%, respectively. Multivariate analysis showed that the in-ICU mortality was significantly associated with APACHE (Acute Physiology and Chronic Health Evaluation) IT scores (odds ratio [OR], 1.11; 95% confidence interval [CI], 1.03-1.11), mechanical ventilation (OR, 6.39; 95% CI, 1.29-31.76), tuberculosis treatment (OR, 2.62; 95% CI, 1.03-6.71), use of antiretroviral therapy (OR, 0.19; 95% CI, 0.05-0.77) and septic shock (OR, 4.38; 95% CI, 1.78-10.76). Septic shock was also associated with long-term survival (hazard ratio, 3.0; 95% CI, 1.316-9.0). In-hospital and in-ICU mortality were higher than those reported for developed countries. ICU admission mostly due to AIDS-related diseases may explain these differences.

692 LUKUDU, D. L. **Pulmonary tuberculosis case detection in South Sudan.** *South Sudan Medical Journal* (2012) **5** (4) 79-84 Juba, South Sudan; South Sudan Doctors Association [En, 23 ref] Healthcare Projects - Real Medicine Foundation, Juba, Sudan

BACKGROUND: The National Tuberculosis (TB) Control Programme in South Sudan was created in 2006, and nongovernmental organizations (NGOs) are its main implementers. Pulmonary tuberculosis (PTB) is a major public health threat. Available literature describes case finding as very low, but treatment success as high. This study was

conducted to establish the true picture of case detection and to suggest ways to improve on case finding. **METHODS:** Recent trends in routine TB case notification as well as case detection and treatment outcome rates were analysed. Approaches and methods utilized in PTB case finding by the involved NGOs were examined. Opinions on how best to improve on case detection were generated. **RESULTS:** There was an increase in the trend of notification from 2002 to 2009, but the sputum smear-positive proportion was stable for the same period. The case detection rates were very low, all below 50% of expected for the given years; treatment success rates were high and stable, at an average of 80%; the defaulter rate was on the increase, especially after 2006. The NGOs seemed to be using the recommended approaches and methods to find and diagnose PTB. There was variation in opinions on how to improve on case detection in the region, with overlap in some instances. **CONCLUSIONS:** PTB case detection has been very low in South Sudan over the last decade; however, the DOTS treatment success rate is high. The high treatment success rate could mean that if more PTB cases could be found in the communities, more are likely to be treated successfully.

693 SEBSIBE TADESSE; TAKELE TADESSE
Evaluating the performance of interpreting Verbal Autopsy 3.2 model for establishing pulmonary tuberculosis as a cause of death in Ethiopia: a population-based cross-sectional study. *BMC Public Health* (2012) **12** (1039) (29 November 2012) London, UK; BioMed Central Ltd [En, 26 ref] Institute of Public Health, The University of Gondar, Gondar, Ethiopia. Email: sbsbtadesse90@gmail.com, takele_tadesse@yahoo.com

BACKGROUND: In resource-poor settings, verbal autopsy data are often reviewed by physicians in order to assign the probable cause of death. But in addition to being time and energy consuming,

the method is liable to produce inconsistent results. The aim of this study is to evaluate the performance of the InterVA 3.2 model for establishing pulmonary tuberculosis as a cause of death in comparison with physician review of verbal autopsy data. **METHODS:** A population-based cross-sectional study was conducted from March to April, 2012. All adults aged ≥ 14 years and died between 01 January 2010 and 15 February 2012 were included in the study. Data were collected by using a pre-tested and modified WHO designed verbal autopsy questionnaire. The verbal autopsy interviews were reviewed by the InterVA model and the physicians. Cohen's kappa statistic, receiver operating characteristic curves, sensitivity, and specificity values were applied to compare the agreement between the InterVA model and the physician review. **RESULTS:** A total of 408 adult deaths were studied. The proportion of tuberculosis-specific mortality was established to be 36.0% and 23.0% by the InterVA model and the physicians, respectively. The InterVA model predicted pulmonary tuberculosis as a cause of death with the probability of 0.80 (95% CI: 0.75-0.85). In classifying all deaths as tuberculosis and non-tuberculosis, the sensitivity and specificity values were 0.82 and 0.78, respectively. A moderate, agreement was found between the model and physicians in assigning pulmonary tuberculosis as a cause of deaths [$\kappa=0.5$; 95% CI: (0.4-0.6)]. **CONCLUSIONS:** This study has revealed that the InterVA model showed a more promising result as a community level tool for generating pulmonary tuberculosis-specific mortality data from verbal autopsy. The conclusion is believed to provide policymakers with a highly needed piece of information for allocating resources for health intervention.

694 YOGARABINDRANATH SWARNA NANTHA
Influence of diabetes mellitus and risk factors in activating latent tuberculosis infection: a case for targeted screening in Malaysia. *Medical Journal of Malaysia* (2012) **67**

(5) 467-472 Kuala Lumpur, Malaysia; Malaysian Medical Association [En, 87 ref.] Primary Health Care Tuberculosis Treatment Unit, Seremban Primary Health Clinic, Seremban, Malaysia. Email: yogarabin@gmail.com

A review of the epidemiology of tuberculosis, its contributing risk factors (excluding HIV) and the role of screening latent tuberculosis infection in Malaysia was done. Despite the global and domestic decrease in prevalence rates of tuberculosis in the past decade there is an alarming increase in the trend of non communicable diseases in the country. High prevalence rates of major risk factors leading to reactivation of tuberculosis were seen within the population, with diabetes mellitus being in the forefront. The rising numbers in the ageing population of Malaysia poses a further threat of re-emergence of tuberculosis in the years to come. Economically, screening of diabetic patients with comorbidities for latent tuberculosis infection (LTBI) using two major techniques, namely tuberculin sensitivity (TST and Interferon gamma release assay tests (IGRA) could be a viable option. The role of future research in the detection of LTBI in the Malaysian setting might be necessary to gauge the disease reservoir before implementing prophylactic measures for high risk groups involved.

695 STEFAN, D. C.; DIPPENAAR, A.; BRUIN, G. DE; UYS, R.; TOORN, R. VAN **Challenges to treatment of leukemia in HIV-positive children.** *Journal of Tropical Pediatrics* (2012) **58** (6) 521-522 Oxford, UK; Oxford University Press [En, 3 ref.] Department of Paediatrics and Child Health, Tygerberg Hospital and Stellenbosch University, Tygerberg, Cape Town 7550, South Africa. Email: cs@sun.ac.za

We describe the challenges to treatment of leukemia in three cases of human immunodeficiency virus (HIV)-infected children with multiple infections and complications. Two of the three patients had acute myeloid leukemia and

the other one acute lymphoblastic leukemia. Two of the patients were known with HIV infection the third was diagnosed on admission. All patients received retroviral therapy with standard doses of lamivudine, stavudine and efavirenz or lopinavir/retonavir. All three were diagnosed with *Mycobacterium tuberculosis* on one or more occasions: pulmonary or miliary involvement or tuberculous meningitis. One patient developed spinal paraplegia and needed an urgent laminectomy. Later he recovered almost completely. The interaction between antiretroviral and antituberculosis treatments combined with chemotherapy, antibiotics and supportive care is not known. Despite the severity and the complexity of several associated diseases, the outcome of the patients was rewarding and encouraging.

696 GAO YAN; OU QINFANG; HUANG FULL; WANG SEN; SHEN LEI; SHEN YAOJIE; WUJING; ZHENG JIAN; WENG XINHUA; ZHANG WENHONG; SHAO LINGYUN **Improved diagnostic power by combined interferon-gamma release assay and nested-PCR in tuberculous pleurisy in high tuberculosis prevalence area.** *FEMS Immunology and Medical Microbiology* (2012) **66** (3) 393-398 Oxford, UK; Wiley-Blackwell [En, 24 ref.] Department of Infectious Diseases, Huashan Hospital, Fudan University, Shanghai, China. Email: lingyun26@fudan.edu.cn

The conventional acid fast bacilli (AFB) smear and *Mycobacterium tuberculosis* (*M.tb*) culture of pleural effusion and tuberculin skin test (TST) in tuberculous pleurisy are unable to meet clinical needs because of their low sensitivities and specificities. To evaluate the diagnostic accuracies of QuantiFERON TB Gold In-Tube test (QFT-GIT) and nested-PCR in tuberculous pleurisy, we conducted a cross-sectional study in regions of China with a high tuberculosis (TB) epidemic. Seventy-eight participants were enrolled: 58 TB patients with diagnosis of confirmed or probable tuberculous pleurisy and 20 non-TB patients with

a diagnosis of other non-TB diseases. The positive rates of AFB smear and *M.tb* culture in the pleural effusion were 5.8% (2/42) and 10.6% (5/47), respectively. The sensitivity and specificity of QFT-GIT were 93.1% (54/58) and 90.0% (18/20), whereas those of TST were 68.5% (37/54) and 86.7% (13/15), respectively; the sensitivity of QFT-GIT was significantly higher than TST ($P=0.013$). The sensitivity and specificity of *M.tb*-specific nested-PCR in pleural effusion were 94.8% (55/58) and 90.0% (18/20), respectively, with a turnaround time of 7 h. Furthermore, combined QFT-GIT and nested-PCR detection improves the specificity to 100% with a sensitivity of up to 90.0%. This combination of immunoassay and molecular detection holds promise for the clinical diagnosis of tuberculous pleurisy.

1025 NASEHI, M. M.; MOOSAZADEH, M.; AMIRESMAEILI, M. R.; PARSAEE, M. R.; NFZAMMAHALLEH, A. **[The epidemiology of factors associated with screening and treatment outcomes of patients with smear positive pulmonary tuberculosis: a population-based study.]** *Journal of Mazanrjarian University of Medical Sciences* (2012) **22** (Suppl. 1) Pe9-Pe18, En8 Sari, Iran; Mazandaran University of Medical Sciences [pe, en, 33 ref] Department of Pediatrics, Faculty of Medicine, Mazandaran University of Medical Sciences, Sari, Iran. Email: cdctbmaz@yahoo.com

BACKGROUND AND PURPOSE: Tuberculosis is an acute/chronic, infectious and necrotizing disease involving different organs of the body, particularly the lungs. Since controlling, screening, and treatment of people infected with smear positive pulmonary tuberculosis has been highlighted in national and global objectives, this study aimed at conducting an epidemiological investigation of smear positive pulmonary tuberculosis patients and describing and analyzing the conditions to provide efficient suggestions to improve the status quo. **MATERIALS AND METHODS:** The present study described and analyzed the existing

data. A checklist consisting of variables such as age, gender, nationality, place of residence, results of mucus smears at the beginning, at the end of the second month and at the end of the treatment, was used for data collection. Descriptive statistics and univariate and multivariate regression of the collected data were carried out using Excel and SPSS 1.6. **RESULTS:** The total number of identified tuberculosis cases during the study were 1296 among which 48.2 percent were smear positive pulmonary tuberculosis, 24.5 percent were smear negative pulmonary tuberculosis and 27.3 percent suffered from extra-pulmonary tuberculosis. The incidence of smear positive pulmonary tuberculosis was 4.3 in one hundred thousand people. It was shown that 57.5 percent of the identified smear positive pulmonary tuberculosis was males, while 42.5 percent were females; the mean age of the participants was 49.67 ± 21.60 years. **CONCLUSION:** Epidemiological pattern observed in this study was consistent with other similar studies. In order to achieve the millennium development goal (50 percent decrease in tuberculosis prevalence and eliminating the disease up to the year 2050), and the national goals of tuberculosis controlling program, it is suggested that educating, screening and on time treatment of the smear positive pulmonary tuberculosis patients be considered at all levels of the health network as well as private sectors and physicians offices.

1026 KAYE-EOOIE, G. H.; BLACK, A. D. **Comparison of empyema thoracis in HIV-infected and non-infected patients with regard to aetiology and outcome.** *Southern African Journal of Epidemiology & Infection* (2012) **27** (4) 189-194 Johannesburg, South Africa; South African Institute for Medical Research [En, 29 ref] Respiratory Unit, Department of Internal Medicine, University of the Witwatersrand, Chris Hani Baragwanath Academic Hospital, Johannesburg/Soweto, South Africa. Email: drgraceke@gmail.com

Empyema thoracis remains a problem in developing countries. Human immunodeficiency virus (HIV) is a risk factor for the development of empyema. There is a clinical impression that HIV-infected patients with empyema have worse outcomes. This study was conducted to assess whether HIV infection affected aetiology or outcomes of patients with empyema. A retrospective review was conducted of 172 patients, meeting established criteria for the diagnosis of empyema, who were admitted to Chris Hani Baragwanath Hospital between January 2006 and December 2009. HIV-infected and non-infected patients were evaluated for differences in aetiology and outcomes, including length of stay, surgical intervention and local complications of closed-tube thoracostomy. A sub-analysis of HIV-infected patients stratified according to CD4 cell count and use of antiretrovirals (ARVs) was also performed. Of the 172 patients, 125 (73%) were HIV infected, and 47 (27%) were non-infected. HIV-infected patients with lower CD4 cell counts were more likely to be diagnosed with clinical tuberculosis. More commonly, the aetiology of empyema was not determined in HIV-noninfected patients. HIV-infected patients on ARVs were more likely to have thoracic surgery and had shorter hospital stays than those not on ARVs. This study failed to demonstrate any significant differences in aetiology among HIV-infected vs non-infected patients with empyema. There was a trend towards more Gram-negative, infections in the HIV-infected group. ARV use was associated with improved outcomes with regard to cardiothoracic intervention and length of hospital stay.

1027 RATTANAVONG, S.; VONGTHONGCHIT, S.; BOUNPHAMALA, K.; VONGPHAKDY, P.; GUBLER, J.; MA YXAY, M.; PHETSOUVANH, R.; ELLIOTT, I.; LOGAN, J.; HILL, R.; NEWTON, P. N.; DANCE, D. **Actinomycetoma in SE Asia: the first case from Laos and a review of the literature.** *BMC Infectious Diseases* (2012) **12**

(349) (12 December 2012) London, UK; BioMed Central Ltd [En, 35 ref.] Lao-Oxford-Mahosot Hospital-Wellcome Trust Research Unit, Microbiology Laboratory, Mahosot Hospital, Vientiane, Laos. Email: sayaphet@ tropmedres.ac, sivyaytc@yahoo.com, hou_pm@yahoo.com, P_Phakdy@yahoo.com, jacques.gubler@ksw.ch, mayfong@tropmedres.ac, Rattana-phone@tropmedres.ac, ivoelliott@doctors.org.uk, Julie.Logan@hpa.org.uk, RobertHill@HPA.org.uk, paul@tropmedres.ac, david.d@tropmedres.ac

BACKGROUND: Mycetoma is a chronic, localized, slowly progressing infection of the cutaneous and subcutaneous tissues caused either by fungi (eumycetoma or implantation mycosis) or by aerobic actinomycetes (actinomycetoma). It is acquired by traumatic implantation, most commonly in the tropics and subtropics, especially in rural agricultural communities. Although well recognized elsewhere in Asia, it has not been reported from the Lao People's Democratic Republic (Laos). **CASE PRESENTATION:** A 30 year-old female elementary school teacher and rice farmer from northeast Laos was admitted to Mahosot Hospital, Vientiane, with a massive growth on her left foot, without a history of trauma. The swelling had progressed slowly but painlessly over 5 years and multiple draining sinuses had developed. Ten days before admission the foot had increased considerably in size and became very painful, with multiple sinuses and discharge, preventing her from walking. Gram stain and bacterial culture of tissue biopsies revealed a branching filamentous Gram-positive bacterium that was subsequently identified as *Actinomadura madurae* by 16S rRNA gene amplification and sequencing. She was treated with long-term co-trimoxazole and multiple 3-week cycles of amikacin with a good therapeutic response. **CONCLUSION:** We report the first patient with actinomycetoma from Laos. The disease should be considered in the differential diagnosis of chronic skin and bone infections in patients from rural SE Asia.

1028 JAIN, R. R.; KAORE, N. M.; RAMNANI, V. K. **Evaluation of fluorescent staining for improvement in diagnosis of pulmonary tuberculosis in sputum smear negative cases.** *International Journal of Pharma and Bio Sciences* (2012) **3** (2) B-521-B-526 Andhrapradesh, India; International Journal of Pharma and Bio Sciences [En, 12 ref] Department of Microbiology, Peoples College of Medical Sciences & RC, Bhanpur Road, India.

Bright field microscopy of sputum after ZN staining is the backbone of revised national tuberculosis control program (RNTCP) for diagnosis of pulmonary tuberculosis. But reduced sensitivity in overburdened RNTCP centers and HIV-TB co-infection necessitates the use of newer modalities to increase the diagnostic yield. A cross sectional prospective analytical study was done from June 2011 to August 2011, to look for increase in sensitivity in diagnosis of pulmonary tuberculosis by examination of sputum smear negative cases by fluorescent microscopy. Two sets of smears were prepared, of which one set of smear was subjected to ZN stain to confirm sputum smear negativity. The second set of slides was stained collectively by fluorescent stain and observed by Labomed binocular LED Microscope with fluorescent attachment. All the data was maintained in Microsoft Office Excel for analysis. Four out of 160 (2.50%) enrolled were found out to be positive on reconfirmation and excluded. Out of 156 samples subjected to fluorescent staining, thirteen samples were reported positive by two independent observers. This rise of 8.33% over routine RNTCP method which was able to diagnose 5.88% (10/170) cases is highly significant with $P < 0.017$ ($\chi^2 = 5.686$). These 13 additional cases diagnosed constitute 92.85% increase in case detection when compared to RNTCP method which only detected 14 cases. Fluorescence microscopy is much more effective in diagnosis of paucibacillary cases with ease of identification and less eyestrain.

1029 MATSUMOTO, C. K.; CHLMARA, E.; RAMOS, J. P.; CAMPOS, C. E. D.; CALDAS, P. C. DE S.; LIMA, K. V. B.; LOPES, M. L.; DUARTE, R. S.; LEAO, S. C. **Rapid tests for the detection of the *Mycobacterium abscessus* subsp. *bolletii* strain responsible for an epidemic of surgical-site infections in Brazil.** *Memórias do Instituto Oswaldo Cruz* (2012) **107** (8) 969-970 Rio de Janeiro, Brazil; Instituto Oswaldo Cruz [En, 23 ref.] Departamento de Microbiologia, Imunologia e Parasitologia, Escola Paulista de Medicina, Universidade Federal de São Paulo; São Paulo, SP, Brazil. Email; criskmatsumoto@yahoo.com.br

A single strain of *Mycobacterium abscessus* subsp. *bolletii*, characterised by a particular *rpoB* sequevar and two highly related pulsed field gel electrophoresis patterns has been responsible for a nationwide outbreak of surgical infections in Brazil since 2004. In this study, we developed molecular tests based on polymerase chain reaction restriction-enzyme analysis (PRA) and sequencing for the rapid identification of this strain. Sequences of 15 DNA regions conserved in mycobacteria were retrieved from GenBank or sequenced and analysed *in silico*. Single nucleotide polymorphisms specific to the epidemic strain and located in enzyme recognition sites were detected in *rpoB*, the 3' region of the 16S rDNA and *gyrB*. The three tests that were developed, i.e., PRA_{*rpoB*}, PRA-16S and *gyrB* sequence analysis, showed 100%, 100% and 92.31% sensitivity and 93.06%, 90.28% and 100% specificity, respectively, for the discrimination of the surgical strain from other *M. abscessus* subsp. *bolletii* isolates, including 116 isolates from 95 patients, one environmental isolate and two type strains. The results of the three tests were stable, as shown by results obtained for different isolates from the same patient. In conclusion, due to the clinical and epidemiological importance of this strain, these tests could be implemented in reference laboratories for the rapid preliminary diagnosis and epidemiological surveillance of this epidemic strain.

1030 KENDON, M.; KNIGHT, S. E.; ROSS, A.; GIDDY, J. **Timing of antiretroviral therapy initiation in adults with HIV-associated tuberculosis: outcomes of therapy in an urban hospital in KwaZulu-Natal.** *SAMJ - South African Medical Journal* (2012) **102** (12) 931-935 Pretoria, South Africa; SAMA Health and Medical Publishing Group [En, 15 ref.] Department of Family Medicine, University of KwaZulu-Natal, Durban, South Africa. Email: maryanne_kendon@yahoo.com

BACKGROUND: HIV-associated tuberculosis (TB) is common in South Africa. The optimal time for initiating antiretroviral therapy (ART) in co-infected patients is a clinical challenge. **AIM:** We aimed to compare clinical outcomes of patients with HIV-associated TB who commenced ART at different stages of TB therapy. **METHODS:** A retrospective chart review was conducted of 458 patients who initiated ART at ≤ 28 days (immediate), 29-56 days (early) and ≥ 57 days (delayed) after commencing TB therapy, and clinical outcomes after 6 months of ART were compared. **RESULTS:** There was a higher mortality in the immediate group, although this was not significant. Renal impairment (hazard ratio (HR) 2.5; 95% confidence interval (CI) 1.3-4.9; $p=0.004$) and inpatient ART initiation (HR 3.7; 95% CI 1.6-8.2; $p=0.001$) were risk factors for HIV-associated TB mortality. A baseline haemoglobin concentration ≥ 10 g/dl (HR 0.2; 95% CI 0.1-0.6; $p=0.003$), extrapulmonary as opposed to pulmonary TB (PTB) (HR 0.3; 95% CI 0.1-0.7; $p=0.005$) and extrapulmonary plus PTB as opposed to PTB (HR 0.3, 95% CI 0.1-0.6; $p=0.002$) were significantly associated with decreased mortality. **CONCLUSION:** The timing of initiation of ART after commencing TB therapy was not significantly associated with increased mortality or survival. Patients with more advanced disease were more likely to die. Early HIV testing and ART initiation is recommended to decrease mortality.

1031 BEYENE MOGES; BEMNET AMARE; FANAYE ASFAW; WOGAHTA TSEFAYE; MOGES TIRUNEH; YESHAMBEL BELYHUN; ANDARGACHEW MULU; AFEWORK KASSU **Prevalence of smear positive pulmonary tuberculosis among prisoners in North Gondar Zone Prison, northwest Ethiopia.** *BMC Infectious Diseases* (2012) **12** (352) (15 December 2012) London, UK; BioMed Central Ltd [En, 34 ref.] Department of Immunology and Molecular Biology, School of Biomedical and Laboratory Sciences, College of Medicine and Health Sciences, University of Gondar, P.O.BOX 196, Gondar, Ethiopia. Email: beyemoges@gmail.com

BACKGROUND: People concentrated in congregated systems, such as prisons, are important but often neglected reservoirs for TB transmission, and threaten those in the outside community. Therefore, this study was conducted to determine the prevalence of tuberculosis in a prison system of North Gondar Zone. **METHODS:** An active case-finding survey in North Gondar Prison was carried out from March to May 2011. All prison inmates who had history of cough for at least a week were included in the study. Three morning sputum samples were collected from suspected inmates and examined through fluorescence microscopy. Fine needle aspiration cytology was done for those having significant lymphadenopathy. Pre and post HIV test counseling was provided after written consent. Binary logistic and multi variable analysis was performed using SPSS version 16. **RESULTS:** A total of 250 prisoners were included in the survey. Among these, 26 (10.4%) prisoners were found to have TB giving a point prevalence of 1482.3 per 100,000 populations of smear positive TB among the TB suspects. All the inmates who participated in the study volunteered for HIV testing and a total of 19(7.6%) inmates were found to be reactive for the HIV antibody test amongst of which 9(47.4%) had TB co-infection. The prevalence of HIV infection in the TB infected

inmates was found to be 34.6% (9/26). From the 26 TB cases identified 12 (46.2%) were having under nutrition (BMI<18.5 kg/m²). CONCLUSIONS: There is high prevalence of TB in North Gondar Prison with possible active transmission of TB within the prison. There was a high prevalence of HIV among the TB suspects. Strong cooperation between prison authorities and the national tuberculosis control programmes is urgently required to develop locally appropriate interventions to reduce transmission. The determinants for poor nutrition in the prison need also further investigation.

1032 HERNÁNDEZ-LEÓN, C.; BADIAL-HERNÁNDEZ, F.; PONCE-DELEÓN, A.; SIERRA-MADERO, J. G.; MARTÍNEZ-GAMBOA, A.; CRABTREE-RAMÍREZ, B.; BAUTISTA-ARREDONDO, S.; GONZÁLEZAGUIRRE, A.; GUERRERO-ALMEIDA, M. DE L.; VALLE, J. M. B. DEL; GONZÁLEZ-RODRÍGUEZ, A.; SIFUENTES-OSORNIO, J. **[Active tuberculosis in a cohort of HIV-infected inmates in a prison in Mexico City: clinical and epidemiological characteristics.]** Tuberculosis activa en una cohorte de reclusos infectados por VIH en una cárcel de la ciudad de México: características clínicas y epidemiológicas. *Salud Pública de México* (2012) **54** (6) 571-578 Cuernavaca, México; Instituto Nacional de Salud Pública [Es, en, 31 ref.] Instituto Nacional de Ciencias Médicas y Nutrición Salvador Zubirán, Vasco de Quiroga 15, colonia Sección XVI, 14000 Delegación Tlalpan, México, DF, Mexico. Email: sifuentesosornio@gmail.com

OBJECTIVE: To determine the clinical and epidemiological characteristics of prison inmates with active tuberculosis in HIV-positive prison populations. MATERIALS AND METHODS. We conducted a cohort study in HIV-infected subjects in a prison in Mexico City, with the aim of determining clinical and epidemiological characteristics of cases with active TB. RESULTS: We detected 172 HIV infected inmates and TB in 28 of them (16.3%) - 21 (12.2) with pulmonary TB -

with an incidence rate of 7.7/100 persons/year for active TB and 4.7/100 persons/year for pulmonary TB. No drug resistance was found. Two clusters (4 and 2 subjects) were observed after RFLP-typing of 18 isolates, with a transmission rate of 11 % by molecular and clinical analysis. CONCLUSIONS: The prevalence of active TB was found to be a thousand times greater than in the general population. Evidence of transmission inside the prison was also found.

1033 RODRIGUES JÚNIOR, I. A.; SILVA, I. C. C.; GRESTA, L. T.; LYON, S.; VILLARROEL, M. DE F.; ARANTES, R. M. E. **Degree of skin denervation and its correlation to objective thermal sensory test in leprosy patients.** *PLoS Neglected Tropical Diseases* (2012) **6** (12) e1975 San Francisco, USA; Public Library of Sciences (PLoS) [En, 49 ref.] Departamento de Patologia, Instituto de Ciências Biológicas, Universidade Federal de Minas Gerais, Belo Horizonte, Brazil. Email: rosa@icb.ufmg.br

BACKGROUND: Leprosy is an infectious disease affecting skin and peripheral nerves resulting in increased morbidity and physical deformities. Early diagnosis provides opportune treatment and reduces its complications, relying fundamentally on the demonstration of impaired sensation in suggestive cutaneous lesions. The loss of tactile sensitivity in the lesions is preceded by the loss of thermal sensitivity, stressing the importance of the thermal test in the suspicious lesions approach. The gold-standard method for the assessment of thermal sensitivity is the quantitative sensory test (QST). Morphological study may be an alternative approach to access the thin nerve fibers responsible for thermal sensitivity transduction. The few studies reported in leprosy patients pointed out a rarefaction of thin dermo-epidermal fibers in lesions, but used semi-quantitative evaluation methods. METHODOLOGY/PRINCIPAL FINDINGS: This work aimed to study the correlation between the degree of thermal sensitivity impairment measured by QST and the degree of denervation

in leprosy skin lesions, evaluated by immunohistochemistry anti-PGP 9.5 and morphometry. Twenty-two patients were included. There were significant differences in skin thermal thresholds among lesions and contralateral skin (cold, warm, cold induced pain and heat induced pain). The mean reduction in the density of intraepidermal and subepidermal fibers in lesions was 79.5% (SD=19.6) and 80.8% (SD=24.9), respectively. **CONCLUSIONS/SIGNIFICANCE:** We observed a good correlation between intraepidermal and subepidermal fibers deficit, but no correlation between these variables and those accounting for the degree of impairment in thermal thresholds, since the thin fibers rarefaction was homogeneously intense in all patients, regardless of the degree of sensory deficit. We believe that the homogeneously intense denervation in leprosy lesions should be objective of further investigations focused on its diagnostic applicability, particularly in selected cases with only discrete sensory impairment, patients unable to perform the sensory test and especially those with nonspecific histopathological finds.

1034 YONE, E. W. P.; KUABAN, CO; SIMO, L. **[Thoracentesis versus percutaneous thoracic drainage in the treatment of thoracic empyema in abundance: a preliminary prospective and comparative study.]** Thoracocentèse versus drainage thoracique percutané dans le traitement des empyèmes thoraciques non tuberculeux de grande abondance: étude prospective e.t comparative préliminaire. *Pan African Medical Journal* (2012) **13**, 13 Kampala, Uganda; African Field Epidemiology Network [Fr, 13 ref.] Département de médecine interne et spécialités-Faculté de Médecine et des Sciences Biomédicales-Université de Yaoundé I/Service de Pneumologie-Hôpital Jamot de Yaoundé, BP 4021, Yaounde, Cameroon. Email: pefura2002@yahoo.fr

The efficacy of repeated thoracentesis versus percutaneous thoracic drainage was compared

between adult patients with thoracic empyema [Cameroon]. In this prospective, comparative study carried out from August 2007-September 2010, there were 32 adult patients with thoracic empyema abundance, 12 patients who underwent repeated thoracocentesis and 20 patients with percutaneous thoracic drainage. The main criterion for comparison was the proportion of patients in both groups who had died in service or transferred surgery (unfavourable). Secondary endpoints compared the duration of hospitalization and complications associated with each of these 2 techniques. The unfavourable trend was observed in 3 (25%) patients in the thoracocentesis group and in 5 (25%) patients in the thoracic drainage group ($P=1.000$). Failure of thoracocentesis was noted in 3 cases and failure of thoracic drainage in 4 cases. One (5%) patient died in the drainage group and no patient died in the thoracocentesis group. The mean duration of hospitalization was 31.7 ± 22.7 days in patients treated with thoracocentesis versus 29.4 ± 16.7 days in patients treated with thoracic drainage ($P=0.768$). Complications related to these techniques were found in 4 (20%) patients treated with drainage and in 1 (8.3%) patient treated by thoracocentesis ($P=0.626$). Repeated thoracocentesis and percutaneous thoracic drainage seem to have a failure rate and complications similar in the treatment of pleural empyema in abundance.

1035 EL-BARNI, R.; LAHKIM, M.; ACHOUR, A. **[Abdominal tuberculosis pseudo-tumour.] La tuberculose abdominale pseudo-tumorale.** *Pan African Medical Journal* (2012) **13**, 32 Kampala, Uganda; African Field Epidemiology Network [Fr, 24 ref.] Service de chirurgie generale. Hôpital militaire Avicenne, Marrakech, Morocco.

Five cases of abdominal tuberculosis pseudo-tumour are described in order to highlight the diagnostic and therapeutic aspects. Five observations were collected in the general surgery department of the military hospital of

Marrakech Avicenna, Morocco in 2007. Clinical aspects are disparate. Peritoneal syndrome was noted in one case, an epigastric mass in one case, suspicious lesion of the sigmoid colon in one case, a mass on the right iliac fossa in a case and impaired general condition with fever in the last case. One patient had undergone a biopsy-guided scan and the remaining 4 patients underwent surgery. A mass on the mesocolon was observed in the first case. In the second case, the appearance of the epigastric mass and its headquarters were due to tumour of the greater omentum. Localization and sigmoid peritoneal tuberculosis was found in the third case. The diagnosis of a tumour of the right colon was highly suspected in the HIV patient who presented postoperative peritonitis and died of septic shock. The appearance of necrotic lesions found on the computed tomography of only 1 patient in the study was lymphoma. Even in the absence of a history of pulmonary tuberculosis, abdominal tuberculosis and a diagnosis of pseudo-tumour should be considered especially in an endemic country. The use of laparotomy is justified whenever doubt exists or if there is diagnostic complication.

1036 CHENG RUOQIN; JIN HONGHUA; WANG HUAMIN; ZHOU JUN **The clinic pathologic features and MRI manifestations of the thoracic lumbar tuberculosis.** *Health* (2012) 4 (12) 1238-1240 Irvine, USA; Scientific Research Publishing [En, 8 ref.] MRI Department of the Affiliated Tian-You Hospital, Wuhan University of Science & Technology, Wuhan, China. Email: ihoujun011110@sina.com

OBJECTIVE: To explore the clinicpathologic features and MRI manifestations of the thoracic lumbar tuberculosis by undergoing MRI and pathological examinations. METHODS: 34 cases of Thoracic lumbar tuberculosis were collected which underwent MRI examination and confirmed by pathology or treatment of antiTB drugs, the clinical cure from June 2008 to June

2012 in our hospital. The first MRI was performed on all patients, to determine the MRI findings, and surgical treatment for pathological examination in order to determine the pathological features. RESULTS: 34 patients with 81 vertebral involvement, in which two adjacent vertebral involvement is the common, accounting for 72.25%, vertebral showed uneven long T1, long T2 signal. Intervertebral disc abnormalities accounted for 90.17%, the performance showed long T1, long T2 signal changes in the intervertebral disc damage, often accompanied by disc space narrowing or disappear. Paraspinal abscess accounted for 90.67%, often more than vertebra, up and down across one or more vertebral bodies showed long T1, long T2 signal. The vertebrae were damaged kyphosis or (and) the posterior longitudinal ligament abscess caused by the dural sac and spinal column with pressure accounted for 74.72%. In enhanced scan, vertebrae, intervertebral discs showed heterogeneous enhancement, paraspinal abscess was curved or ring enhancement. The pathological diagnosis may be obvious to confirm the degree of swelling and lesions. CONCLUSION: By doing the MRI and pathologic examinations, it can determine the clinical and pathological features and MRI findings of spinal tuberculosis patients with Thoracic lumbar spinal tuberculosis, and lay a reliable foundation for the treatment of the subsequent treatment.

1037 RAHMO, A.; HAMDAR, Z.; KASAA, I.; DABBOUSSI, F.; HAMZE, M. **Genotypic detection of rifampicin-resistant *M. tuberculosis* strains in Syrian and Lebanese patients.** *Journal of Infection and Public Health* (2012) 5 (6) 381-387 Oxford, UK; Elsevier Ltd [En, 28 ref.] National Commission for Biotechnology, Damascus, Syria. Email: mharnze@monzerharnze.com

SETTING: The incidence of multi- and extensively drug-resistant TB cases is increasing in many countries. Resistance to rifampicin is widely considered a surrogate marker for multiple drug

resistant TB. No eHorts have been made to identify and quantify the drug-resistant genotypes in the Syrian and Lebanese communities. OBJECTIVE: The genotypic characterization of *rpoB* mutations in the rifampicin drug-resistance region (RRDR) of resistant *Mycobacterium tuberculosis* isolates in Syrian and Lebanese patients. DESIGN: The pyrosequencing technique was applied to DNA derived from the *M. tuberculosis* isolates of 56 patients. RESULTS: RRDR sequencing identified 97 modified codons representing 35 different mutations; 31 (34%) of the 97 modifications were novel and have not been previously reported. The changes were mostly within codons 531 (37/97: 38%), 533 (28/97: 29%) and 526 (9/97: 9%). Additionally, 30 (54%) isolates had multiple codon changes. CONCLUSION: This study indicates the importance of the RRDR hotspot region for the detection of rifampicin resistance in MTB clinical isolates from Syrian and Lebanese patients. However, new mutations and mutations in other locations within the RRDR were also observed. The vast majority (95%) of the studied isolates from this pool of patients contained mutations in codons 531 and/or 533.

1038 SAID, H. M.; KOCK, M. M.; ISMALL, N. A.; BABA, K.; OMAR, S. V.; OSMAN, A. G.; HOUSEN, A. A.; EHLERS, M. M. **Comparison between the BACTEC MGIT 960 system and the agar proportion method for susceptibility testing of multidrug resistant tuberculosis strains in a high burden setting of South Africa.** *BMC Infectious Diseases* (2012) **12** (369) (22 December 2012) London, UK; BioMed Central Ltd [En, 39 ref.] Department of Medical Microbiology, Faculty of Health Science, University of Pretoria, Private Bag X323, Arcadia, Pretoria, 0007, South Africa. Email: ahlammdd@yahoo.com

BACKGROUND: The increasing problem of multidrug-resistant (MDR) tuberculosis (TB) [ie resistant to at least isoniazid (INH) and rifampicin (RIF)] is becoming a global problem. Successful

treatment outcome for MDR-TB depends on reliable and accurate drug susceptibility testing of first-line and second-line anti-TB drugs. METHOD: Consecutive *M. tuberculosis* isolates identified as MDR-TB during August 2007 to January 2008 using the BACTEC MGIT 960 systems and the agar proportion method were included in this study. Susceptibility testing of MDR-TB isolates against ethambutol (EMB) and streptomycin (STR) as well as two secondline anti-TB drugs, kanamycin (KAN) and ofloxacin (OFX) was performed using the BACTEC MGIT 960 systems at a routine, diagnostic laboratory. The results were compared to those obtained by the agar proportion method. RESULT: The agreement between the BACTEC MGIT 960 system and the agar proportion method was 44% for EMB, 61% for STR and 89% for both KAN and OFX. The sensitivity and specificity of the BACTEC MGIT 960 system using the agar proportion method as a gold standard was 92% and 37% for EMB, 95% and 37% for STR, 27% and 97% for KAN and 84% and 90% for OFX, respectively. CONCLUSIONS: The BACTEC MGIT 960 system showed acceptable sensitivity for EMB, STR, and OFX; however, the BACTEC MGIT 960 system was less specific for EMB and STR and demonstrated a low sensitivity for KAN. The lower agreement found between the two methods suggests the unreliability of the BACTEC MGIT 960 system for the drugs tested. The reasons for the lower agreement between the two methods need to be investigated and further studies are needed in this setting to confirm the study finding.

1039 AABYE, M. G.; HERMANSEN, T. S.; RUHWALD, M.; PRAYGOD, G.; FAURHOLT-JEPSEN, D.; JEREMIAH, K.; FAURHOLT-JEPSEN, M.; RANGE, N.; FRIIS, H.; CHANGALUCHA, J.; ANDERSEN, A. B.; RA VN, P. **Negative effect of smoking on the performance of the QuantiFERON TB gold in tube test.** *BMC Infectious Diseases* (2012) **12** (379) (27 December 2012) London, UK; BioMed Central Ltd [En, 32 ref.] Clinical Research Centre, Copenhagen University Hospital Hvidovre,

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BACKGROUND: False negative and indeterminate Interferon Gamma Release Assay (IGRA) results are a well documented problem. Cigarette smoking is known to increase the risk of tuberculosis (TB) and to impair Interferon-gamma (IFN- γ) responses to antigenic challenge, but the impact of smoking on IGRA performance is not known. The aim of this study was to evaluate the effect of smoking on IGRA performance in TB patients in a low and high TB prevalence setting respectively. **METHODS:** Patients with confirmed TB from Denmark (DK, n=34; 20 smokers) and Tanzania (TZ, n=172; 23 smokers) were tested with the QuantiFERON-TB Gold In tube (QFT). Median IFN- γ level in smokers and non smokers were compared and smoking was analysed as a risk factor for false negative and indeterminate QFT results. **RESULTS:** Smokers from both DK and TZ had lower IFN- γ antigen responses (median 0.9 vs. 4.2 IU/ml, $p=0.04$ and 0.4 vs. 1.6, $p<0.01$), less positive (50 vs. 86%, $p=0.03$ and 48 vs. 75%, $p<0.01$) and more false negative (45 vs. 0%, $p<0.01$ and 26 vs. 11%, $p=0.04$) QFT results. In Tanzanian patients, logistic regression analysis adjusted for sex, age, HIV and alcohol consumption showed an association of smoking with false negative (OR 17.1, CI: 3.0-99.1, $p<0.01$) and indeterminate QFT results (OR 5.1, CI: 1.2-21.3, $p=0.02$). **CONCLUSIONS:** Cigarette smoking was associated with false negative and indeterminate IGRA results in both a high and a low TB endemic setting independent of HIV status.

1040 RICKS, P. M.; MAVHUNGA, F.; MODI, S.; INDONGO, R.; ZEAI, A.; LAMBERT, L. A.; DELUCA, N.; KRASHLN, J. S.; NAKASHIMA, A. K.;

HOLTZ, T. H. **Characteristics of multidrug-resistant tuberculosis in Namibia.** *BMC Infectious Diseases* (2012) **12** (385) (29 December 2012) London, UK; BioMed Central Ltd [En, 40 ref.] Centers for Disease Control and Prevention, Atlanta, Georgia, USA. Email: hgp4@cdc.gov, mavhunga@hotmail.com, bkt1@cdc.gov, rindongo@usaid.gov, zezai.a4@gmail.com, la10@cdc.gov, ncd4@cdc.gov, jamiekrashin@gmail.com, aln1@cdc.gov, tkh3@cdc.gov

BACKGROUND: To describe the epidemiology and possible risk factors for the development of multidrug-resistant tuberculosis (MDR-TB) in Namibia. **METHODS:** Using medical records and patient questionnaires, we conducted a case-control study among patients diagnosed with TB between January 2007 and March 2009. Cases were defined as patients with laboratory-confirmed MDR-TB; controls had laboratory-confirmed drug-susceptible TB or were being treated with WHO Category I or Category II treatment regimens. **RESULTS:** We enrolled 117 MDR-TB cases and 251 TB controls, of which 100% and 2% were laboratory-confirmed, respectively. Among cases, 97% (113/117) had been treated for TB before the current episode compared with 46% (115/251) of controls (odds ratio [OR] 28.7, 95% confidence interval [CI] 10.380.5). Cases were significantly more likely to have been previously hospitalized (OR 1.9, 95% CI 1.1-3.5) and to have had a household member with MDR-TB (OR 5.1, 95% CI 2.1-12.5). These associations remained significant when separately controlled for being currently hospitalized or HIV-infection. **CONCLUSIONS:** MDR-TB was associated with previous treatment for TB, previous hospitalization, and having had a household member with MDR-TB, suggesting that TB control practices have been inadequate. Strengthening basic TB control practices, including expanding laboratory confirmation, directly observed therapy, and infection control, are critical to the prevention of MDR-TB.