Type: Poster Presentation

Final Abstract Number: 43.012
Session: Poster Session III
Date: Saturday, March 5, 2016
Time: 12:45-14:15
Room: Hall 3 (Posters & Exhibition)

Quantifying tuberculosis burden and underrepresentation in Malaysia, 1990-2014

N. Ismail [1,*], A.M. Bulgiba [2], S. Rampal [3], F.D. Jiloris [4], N. Nagelkerke [5], M.O. Awang [3]

[1] *University of Technology MARA Sungai Buluh Campus, Sungai Buluh, Selangor, Malaysia*
[2] *Julius Centre University of Malaya, Kuala Lumpur, Malaysia*
[3] *University of Malaya, Kuala Lumpur, Malaysia*
[4] *Disease Control Division, Ministry of Health, Putrajaya, Malaysia*
[5] *United Arab Emirates University, Department of Community Medicine, P.O.B 17666, Al Ain, UAE, Al Ain, United Arab Emirates*

Background: Tuberculosis continues to be the leading infectious disease threat in Malaysia. With recent spikes of burden following the newly intensified case finding programme introduced since year 2011 we estimated how much the national data reflected the actual burden hence objectively quantified the underrepresentation by using mathematical modelling technique.

Methods & Materials: We reviewed tuberculosis pathophysiology and its transmission dynamic that best reflected reality at present which includes primary infection, endogenous reactivation and exogenous reinfection. We used the Malaysian national tuberculosis data from year 1990 till 2014 and constructed a deterministic compartmental model with SEIR structure and ordinary differential equation system. We took into account its unique characteristics on heterogeneity mainly age and gender. Model fitting, probabilistic sensitivity testing and uncertainty analysis were performed. Retrospective projection of the Malaysian tuberculosis cases estimated between year 1990 till 2014 were produced. The model then was compared with the observed data within similar years and further quantified how many cases were underrepresented.

Results: A steady and higher increasing trend of tuberculosis cases were estimated from year 1990 till 2014 between 14,032 to 22,260 cases with annual incidence rate between 1.0% to 5.5% than the national observed number of cases between 11,702 to 24,711 cases with similar annual incidence rate. Further analysis showed underrepresentation rates ranging between 0.32% to 26.84% from year 1990 till 2014. Comparison between model estimates and the national observed number of cases from year 1990 till 2011 showed an annual mean case underrepresentation of 13.49% (95% CI: 10.40;16.58). A slightly lower annual mean case underrepresentation of 13.11% (95% CI: 10.39;15.84) was estimated from year 1990 till 2014 in line with the newly intensified case finding programme introduced since year 2011 onwards.

Conclusion: We conclude that the current Malaysian observed data has an underrepresentation of tuberculosis cases ranging between 13.11% to 13.49%. This knowledge discovery is imperative to objectively complement current work on disease and economic management programmes for greater impact resulting from higher rates of case detection and treatment hence reducing incidence.

http://dx.doi.org/10.1016/j.ijid.2016.02.752

Type: Poster Presentation

Final Abstract Number: 43.013
Session: Poster Session III
Date: Saturday, March 5, 2016
Time: 12:45-14:15
Room: Hall 3 (Posters & Exhibition)

TB outbreak investigation in a faith based boarding school: Challenges and control measures

L. Inamdar [*], M. Gent, R. Ingham, K. Metcalfe

PHE, Leeds, United Kingdom

Background: Tuberculosis burden in UK is unacceptably high compared to similar countries. TB outbreaks in schools are extremely complex and present public health challenges. 7 cases of TB were notified at a faith based female boarding school in a UK city over 5 years. We aim to describe this challenging outbreak investigation.

Methods & Materials: In 2008, the first pulmonary TB case was notified to public health authorities. In subsequent years, more cases were reported. Epidemiological investigations were undertaken in school including risk assessment, contact tracing and screening following each case to identify cases of active or latent TB. Mass screening at school was extremely challenging both in terms of logistics and managing cultural sensitivities. Initially, TB strain typing testing was not available. In 2013, following a case, the whole school was screened again. In early 2014, retrospective review and 24 loci TB strain typing was done to identify transmission chains.

Results: From 2008 to 2013, mass TB screening was done four times in this school. In total, 1524 students and staff were screened. Of these, 98 had latent and 13 had active TB. In 2012, 64 cases (11%) had latent TB and 9 (1.6%) had active TB. Epidemiological investigations did not reveal any chains of transmission. TB strain typing in 2014 revealed that the 2012 case had identical 24 loci strain typing to the 2008 case. Strain typing was not possible in extra-pulmonary TB cases, and cases with missing loci could not be linked microbiologically.

Conclusion: Strain typing data suggests ongoing TB transmission in school. Finding latent and active TB cases in school does not indicate exposure to notified cases, as most students are from a high risk population group. Whole genome sequencing could provide accurate data on 'lineages' of *M. tuberculosis for evidence on chains of transmission.* This outbreak highlights the need for innovative TB prevention and control strategies in such settings. Control measures included risk assessment and screening of new students, BCG vaccination history, prompt referral of symptomatic cases to TB services and raising awareness about TB. Proactive control measures in such high risk settings can minimise spread and prevent future outbreaks.

http://dx.doi.org/10.1016/j.ijid.2016.02.753