

## Book Reviews

**Anti-tuberculosis drug resistance in the world-Fourth global report, The WHO/IUATLD Global project on anti tuberculosis drug resistance surveillance** (World Health Organization, Geneva). 2008. 157 pages. Price: CHF US\$ 30.00; in developing countries: CHF US \$ 21.00  
ISBN 978-92-4-15361-1

This publication provides the latest data on the magnitude of drug resistance in 81 countries and 2 Special Administrative Regions (SARs) of China collected between 2002 and 2007, as well as the most up to date trends from 47 countries collected over a 13 year period. This report includes drug susceptibility test (DST) results from 91,577 patients from 93 settings representing over 35 per cent of the global total of notified new smear-positive TB cases. It includes data from 33 countries that have never been reported. New data are available from some of the high TB burden countries that include India, China, Russian Federation, Indonesia, Ethiopia, Philippines, Viet Nam, Tanzania, Thailand, and Myanmar. Between 1994 and 2007, a total of 138 settings in 114 countries and 2 SARs of China had reported data to the Global Project. Further, the information on XDR TB, HIV and MDR-TB, and the MDR-TB treatment programmes in the world is also provided.

Data on trend of drug resistance (three or more data points) are available from 48 countries. The majority of trend data are reported from low TB prevalence settings; however this report includes data from three Baltic countries and two Russian Oblasts. Trend data were also available from six countries conducting periodic or sentinel surveys (Cuba, Republic of Korea, Nepal, Peru, Thailand, and Uruguay). Data from 36 countries were reported for the first time on age and sex of cases by any resistance and MDR-TB. Seven countries reported data disaggregated by HIV status

and drug resistance pattern. Thirty four countries and two SARs of China reported data on second-line anti-TB drug resistance among patient isolates identified as MDR-TB. This report focuses on MDR-TB since these patients have significantly poorer outcomes than patients with drug susceptible TB.

Based on drug resistance information, it is estimated that 489,139 cases emerged in 2006, and the global proportion of resistance among all cases is 4.8 per cent. China, India, and the Russian Federation are estimated to carry the highest number of MDR cases. China and India carry approximately 50 per cent of the global burden and the Russian Federation a further 7 per cent. Twenty two high TB burden countries (HBCs) account for approximately 80 per cent of the estimated number of new TB cases (all forms) arising each year.

Data on new cases were available for 72 countries and 2 SARs of China. The proportion of resistance to at least one anti-tuberculosis drug (any resistance) ranged from 0 per cent in two Western European countries to 56.3 per cent in Baku, Azerbaijan. The proportion of MDR ranged from 0 per cent in eight countries to 22.3 per cent in Baku, Azerbaijan and 19.4 per cent in the Republic of Moldova. Of the 20 settings surveyed with the highest proportion of MDR-TB among new cases, 14 are located in countries of the former Soviet Union and four in China.

Data on previously treated cases were available for 66 countries and 2 SARs of China. Resistance to at least one anti-tuberculosis drug (any resistance) ranged from 0 per cent in three European countries to 85.9 per cent, in Tashkent, Uzbekistan. The highest proportions of MDR were reported in Tashkent, Uzbekistan (60.0%), and Baku, Azerbaijan (55.8%). New data from Gujarat State, India, are the first reliable source

of data on previously treated cases in India and show 17.2 per cent MDR-TB among this group.

Thirty six countries reported data on cases with unknown treatment history. In most countries this group of cases represented a small proportion of total cases; however, in nine countries, and one city in Spain, this was either the majority or the only group reported.

Evaluation of trends in 47 countries with 3 or more data points shows that in US and Hong Kong significant reduction of the burden of MDR in the population continues. In these countries both TB notifications and MDR are declining, but MDR is declining at a faster rate. In most Central and Western European countries where TB, particularly drug resistant forms of TB, are imported, absolute numbers as well as proportions of MDR among all cases are relatively stable. Both Peru and the Republic of Korea showed increase in MDR among new cases. Both countries showed steady decline in TB notification rates followed by recent leveling off.

Thirty five countries and two special administrative regions were able to report data on XDR-TB. In total, data were reported on 4,012 MDR-TB cases, and among those 7.0 per cent XDR-TB cases were detected. In general, absolute numbers of XDR-TB cases were low in Central and Western Europe, the Americas and in the Asian countries that reported data. The proportion of XDR-TB among MDR-TB in these settings varied from 0 per cent in 11 countries to 30.0 per cent in Japan. A more significant problem lies in the countries of the former Soviet Union. Of the 9 countries that reported, approximately 10 per cent of all MDR-TB cases were XDR ranging from 4.0 per cent in Armenia to almost 24.0 per cent in Estonia; however, these proportions represent a much larger absolute number of cases. Recently released data from South Africa showed that 996 (5.6%) of 17,615 MDR isolates collected from 2004 through October of 2007 were XDR-TB. Since 2002, a total of 45 countries have reported at least one case globally.

Of the seven countries that reported data on drug resistance stratified by HIV status, only Latvia and Donetsk Oblast, Ukraine reported large enough numbers to examine the relationship between the two epidemics. From the data reported in Latvia, the proportion of MDR among HIV positive cases was shown to be stable over time.

By the end of 2007, 67 projects in 51 countries had been provided with second-line anti-TB drugs through

the Green Light Committee for a cumulative total of over 30 000 MDR-TB patients. A total of 23,256 cases of MDR-TB were notified in 2006 (8.7% of these cases were reported from GLC projects) representing less than 5 per cent of the global number of MDR-TB cases estimated to have emerged in 2006. Globally, both the number of MDR TB patients treated as well as the projected numbers for MDR-TB cases to be treated in 2007 and 2008, as reported by National TB Programmes (NTPs), are far below the targets set out by the Global XDR-TB Response Plan.

The report also gives details about the drug resistance issues in the six WHO regions. In the WHO South-East Asia Region, India reported data from three districts and one State, and Indonesia reported data from one district. Of the countries reporting, Mayhurbhanj district in Orissa State, India, Sri Lanka, and Thailand reported less than 2.0 per cent MDR-TB among new cases. Ernakulam district in Kerala, Hoogli district in West Bengal, and Gujarat State, India, as well as Mimika district, of Papua province in Indonesia and Nepal reported between 2.0-3.0 per cent MDR-TB among new cases. Myanmar was the outlier, reporting 3.9 per cent MDR among new cases. The results from the recent survey in Gujarat State in India show low to moderate levels of MDR-TB among new TB cases 2.4 and 17.2 per cent among re-treatment cases. However, India reports that re-treatment cases comprise 13.7 per cent of notified cases in the country, suggesting a considerable burden of MDR-TB in this population. It is widely thought, though little documented, that a large number of registered re-treatment cases are reporting from the private sector. The Revised National TB Control Programme has achieved population coverage of DOTS in all districts in the country in 2006; case detection is about 61 per cent and treatment success at 86 per cent. However, plans for scaling up 24 inter-regional laboratories capable of culture and DST, attached to 24 MDR-TB management sites capable of managing some 5000 cases per year are behind the schedule. Currently most MDR-TB cases are managed in an unregulated private sector with access to second line drugs that are manufactured locally and of variable quality. XDR-TB has been reported in the country and results of second line testing from the State-wide survey in Gujarat and a survey nearly completed in Maharashtra will provide further evidence as to the extent of second line resistance in the country.

The primary success of the project has been its ability to collect comparative baseline data on resistance to first-line anti-TB drugs from areas representing half of the world's TB population, as well as strengthening of the laboratories through the Supranational Laboratory Network. However, the project, by and large, has not achieved its primary objective to measure trends in drug resistance in high burden countries. As part of the Global Plan to Stop TB, 2006-2015 all countries are committed to scaling up diagnostic networks, but as shown by the poor correlation of survey data to routine reporting of MDR-TB in most regions, it is clear that until culture and drug susceptibility testing are the standard of diagnosis everywhere surveys will continue to be important to monitor resistance. However, based on observed operational difficulties in the implementation of repeated surveys it may be time to re evaluate the survey methods we are using, as well as co-ordinate supplementary research to answer the epidemiological questions that routine drug resistance surveillance cannot.

The book has provided up-to-date information about the drug resistance issues in the world. It is strongly recommended for all TB workers, respiratory physicians, general physicians, public health workers, and all the programme managers dealing with TB control in the world.

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**Early life origins of human health & disease,** Newnham JP, Ross MG, editors (Switzerland, Karger), 2009. 224 pages. Price: CHF US\$ 139.00; EUR 99.50 ISBN 978-3-8055-9139-3

Epidemiological, clinical and animal research studies over a period of time have led to a concept of developmental origins of health and disease. The seeds of this concept were sown in 1973 by Dorner and his group, but strengthened by the Barker hypothesis – also called thrifty phenotype hypothesis which through epidemiological data stated that reduced foetal growth is strongly associated with a number of chronic conditions later in life. The recent years have seen phenomenal interest in this concept leading to the

formation of a society by that name and its 6<sup>th</sup> World Congress was held in November 2009, along with the birth of an international journal devoted to the subject. The first treatise on the developmental origins of health and disease was brought out by Peter Gluckman and Mark Hanson in 2006, which has been followed by a few more.

This book written in a lucid readable manner by 63 contributors in 19 chapters covering more than 200 pages brings home, yet again, the fact that the nutritional status (low or high) and environmental factors (pollutants) to which a pregnant mother is subjected, influence the developing foetus such that the impact on health status of the exposed individual remains during the subsequent lifetime. It brings attention to additional risk factors of stress, subtle dietary deficiencies, as well as placental malfunction, affecting the offspring to develop problems in later life. Various experimental evidences have been put together in the different chapters to demonstrate the effects of early foetal environmental influences on lung function, reproductive health, bone structure, muscle mass and strength, kidney, immune tolerance, hypothalamo – hypophyseal axis, endocrine system and the brain. The book emphasizes the fact that it is 'foetal adaptative responses' of the susceptible organ systems to the nutritional and environmental insults during critical periods of development, which render the individual vulnerable to subsequent factors later in life leading to a mismatch with consequences of disease.

An important aspect highlighted and reviewed is that both genetic and the epigenetic effects of environment (through DNA methylation, histone modification and micro RNA) are passed down to the progeny and future generations forming the underlying cause for the burden of many chronic debilitating diseases seen in the offspring. The magnitude of such a transfer is evident in the increasing incidence of diabetes, obesity, cardiovascular disorders and cancer from the epidemiological surveys. This book is the first to review the emerging evidence for early origins of diseases affecting motor control and schizophrenia; although other behavioural disorders linked to increased stress susceptibility from a suboptimal environment during human development have not been dealt with.

This compendium strings these diseases to a time frame of origin in embryonic development, urges the need and discusses the approaches to understand better the mechanism of production and transmission of these

so called lifestyle diseases to future generations and their burgeoning impact on global economy. Through understanding of the mechanisms of gene – environment interaction would emerge therapies for early prevention of these diseases. Nevertheless, the importance of proper nutrition and minimizing the exposure of the developing foetus to pollutants (toxic substances, industrial fumes, fertilizers, noise, temperature, *etc.*) remains the key to this newly understood and emerging field of developmental origins of health and disease (DOHaD).

This book makes absorbing reading for the clinician and researchers interested in the biology of chronic non communicable diseases. This book is a `must' read eye-opener for the guardians of national health and economy.

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## Book Received

**Guide to hygiene and sanitation in aviation**, 3rd ed.  
(World Health Organization, Geneva). 2009. 60 pages.  
Price: CHF/US\$ 20.00; in developing countries:  
CHF/US\$ 14.00  
ISBN 978-92-4-15477-2