d. Health Economics

164

AU: Andersen S
TI : Some aspects of the economics of tuberculosis in India.
SO: Tuberculosis and Chest Disease Workers Conference, 18th, Bangalore, India, 16-19 Jan 1962, p. 204-212.
DT: CP
AB: The present paper describes certain economic aspects of TB in India, but does not attempt to combine them in a model. The estimated direct costs (beds, clinics, BCG campaign, drugs, private practitioners, after-care, social welfare etc. and research, training and administration) and indirect costs (disablement, premature death) of TB services of all kinds in India, based on known number of physical units multiplied by estimated average cost, have been calculated. These calculations demonstrated that the TB control programme which the NTP was proposing, was not substantially more expensive to the nation than existing TB services. It was concluded that a far higher government share would be economical and that district programmes utilising and promoting the development of basic, GHS would also be economical.
KEYWORDS: SOCIAL CHANGE; HEALTH ECONOMICS; INDIA.

165

AU: Nagpaul DR & Vishwanath MK
TI : Economics of health.
SO: Tuberculosis and Chest Diseases Workers Conference, 22nd, Hyderabad, India, 3-6 Feb 1967, p. 277-300.
DT: CP
AB: Health has been defined as the state of perfect physical, social and mental well-being which is somewhat of an abstract definition. In this paper, economics of health is measured through economics of sickness. Because sickness is experienced, it can be measured and it inflicts physical, social and economic sufferings. In a community, economic prosperity is directly dependent on quantum of sickness and its prevention by health services. A sociological enquiry into the part played by disease in the socio-economic development of society was made by carrying out a study in two village population groups. The Social Investigators of NTI made deep, probing questions to elicit presence of symptoms, action taken by them, money spent on treatment and the loss of wages. In the first study, observation-participation technique was adopted. The investigators lived in the village for four months. In the second study, 20% households of those 22 villages which participated earlier in an epidemiological survey conducted by NTI, were interviewed.

Findings of the two studies are combined and presented. Illnesses were classified into major and minor on the basis of clinical severity and the duration of symptoms. In both the studies, 60% of all persons were asymptomatic during 2 months prior to the interview. About 18% had one minor illness, 13% had major illness and only 3% had one major and one minor illness. The quantum of multiple disease (3 or more) occurring in one person was less than 2%. Only 20% of living man-days were spent as sick man-

days. The average annual loss on account of health reasons per family has been estimated to be Rs.90/- and Rs.15/- per capita. The overall economic loss due to sickness, direct and indirect amounted to 3% of the per capita income in the poorer groups of villages and 6% in the economically more favourably placed villages. The material available here strongly suggests that the sizes of households will not have much influence over the sickness in the community. Another significant feature of this study was the phenomenon of substitution within the family whenever the wage earner could not go to work. The evidence examined in this paper suggests that the actual economic loss is only 1/3rd of the calculated loss. It also suggests that the overall cost of sickness to the individuals and family is far less than what is normally calculated and is influenced by the money available in the household.
KEYWORDS: HEALTH ECONOMICS; SOCIAL COST; INDIA.

166

AU: Banerji D
TI : Health economics in developing countries.
SO: Tuberculosis and Chest Diseases Workers Conference, 22nd, Hyderabad, India, 3-6 Feb 1967, p. 301-311.
DT: CP
AB: It is now widely recognised that investment in health fields contributes to economic growth of countries by stimulating growth in ”human capital formation” and by preventing economic loss due to sickness, disability, premature death and cost of treatment. An integrated plan, in which investment in certain key areas in health field is made side by side with investment in similar areas in other social and economic fields, is essential for reversing the vicious circle of poverty and sickness in developing countries. Health economists will have to work in close collaboration with social planners in other fields in order to develop certain common units for measuring health and other social and economic problems and to identify those areas for investment in health fields which have considerable bearing on social and economic development.
KEYWORDS: HEALTH ECONOMICS; SOCIOMETRY; INDIA.

167

AU: Sen AS & Basu RN
TI : Economics of health-the cost of tuberculosis.
SO: INDIAN J TB 1972, 19, 144-158.
DT: Per
AB: In a study of the cost of TB in India, a direct cost of Rs. 29.68 crores annually has been estimated. The morbidity and mortality losses have been quantified taking into account the urban and rural population separately. The data on mortality in rural areas is very meager and is not available according to age and sex. This, and the expected working life for premature mortality have been calculated by the application of statistical methods. The morbidity loss has been estimated at Rs. 288.4 crores and the mortality losses at Rs. 420.41 crores at 4 percent deduction and Rs. 304.96 crores at 10 percent deduction.
KEYWORDS: HEALTH ECONOMICS; SOCIAL COST; SOCIAL WELFARE; INDIA.

168

AU: Murray CJL, Styblo K & Rouillon A

TI : Tuberculosis in developing countries: burden, intervention and cost.

SO: BULL IUAT 1990, 65, 6-21.

DT: Per

AB: This is a report of the "Health Sector Priorities Review" that the World Bank undertook with a number of collaborators, over two years. The core of this review is a series of studies on the public health significance of major clusters of diseases in the developing world and on the costs and effectiveness of currently available technologies for their prevention and case management. This analysis of TB, supported as a part of these studies, revealed the tremendous burden of TB and the existence of interventions of proven efficacy that were some of the most cost-effective in the international public health armamentarium.
KEYWORDS: SOCIO-ECONOMICS; GLOBAL.

169

AU: Dholakia R

TI: The potential economic benefits of the DOTS strategy against TB in India edited by Almeida J

SO: WHO/TB/96.218

DT: WHO Technical Information Series

AB: The DOTS strategy has been demonstrated to overcome most of the short-comings of self-administered chemotherapy such as low cure rates, high relapse and fatality rates, drug resistance etc. There are several benefits from successful application of the DOTS strategy. The objective of this study was to estimate the direct economic benefits by the reduction in the prevalence of TB and deaths averted on account of DOTS. The methodology adopted has been the comparison of the two scenario “with DOTS” and “without DOTS” and deriving the benefits and calculating the discounted value of the contributions of the DOTS by applying the discount rates ranging from 5% to 16%. The estimates are generated by using the marginal productivity of labour and the deaths averted by DOTS among future workers in each age-sex-area category. The discounted value of the contributions of the future workers among the deaths averted in one year due to DOTS, the remaining years of their productive life are considered as the economic benefits of the deaths averted. The total benefits due to DOTS have been estimated as % of G.D.P. in 1993-94 and annualized benefits due to DOTS as % of G.D.P. The potential benefits are derived by using the most reliable 1993 estimates from survey of causes of deaths.

The potential benefits of successful DOTS in India are divided into two broad categories (I) Pure social welfare increasing effects of DOTS which do not generate direct tangible economic benefits. These would include reduced suffering of TB patients, quick and sure cure from the disease, lives saved, disability reduced for dependents and non-workers suffering from TB, the poverty alleviation, the psychic benefits of living in a more healthy way. (ii) Direct tangible economic benefits by improving the efficiency and productivity due to reduction in prevalence of disease and deaths and release of the hospital beds by averting hospitalization of TB patients.

The method of calculation is based on the estimates of population for the base year 1993-94 by age-sex-area as well as of the workers and sectors. Aggregative macro-economic studies and estimates of productivity differentials are used to calculate rural/urban, adult/child, young adult/old adult and male/female workers output gains. These are applied to two groups 'with DOTS' and 'without DOTS' and the benefits in the improvements likely to occur 'with DOTS' have been estimated.

The benefits are based on twin optimistic assumptions: a) DOTS will succeed in tackling pulmonary TB in India (b) DOTS will reach about 90% of TB patients with full instantaneous coverage. It is envisaged to implement DOTS in a phased manner over a few years. As per the findings of the analysis the potential economic benefits of DOTS to the Indian economy is estimated to be around 4% of GDP in real terms or US $ 8.3 billion during 1993-94. The economy gets a return of more than 16% per annum. Since the present value of all future costs attributable to DOTS is likely to be less than 4% of GDP, DOTS can effectively help step up India's future economic growth. Phasing in of DOTS over time reduces value of the economic benefits. The longer the period of phasing, the lower is the discounted value of the benefits. Even with 10 years of phasing and 16% of discount rate all future benefits of DOTS turn out to be 2.1% of G.D.P. Projected incremental costs to the government for successful DOTS implementation throughout India are of the order of US $ 200 million per year, compared to the tangible economic benefits of at least US $ 750 million per year exceeding by several folds of the financial costs.
KEY WORDS: HEALTH ECONOMICS; DOTS; ECONOMIC BENEFITS; INDIA

170

AU: Croft RA & Croft RP
TI: Expenditure and loss of income incurred by tuberculosis patients before reaching effective treatment in Bangladesh
SO: INT J TB & LUNG DIS 1998, 2, 252-54
DT: Per
AB: This small study undertook to assess the economic consequences of developing TB among patients presenting to the TB clinic run by the Danish Bangladesh Leprosy Mission in NW Bangladesh. The loss of income resulting from the illness, and the actual expenditure incurred by medicines and doctor's fees before registration for treatment, were estimated and totaled for 21 patients serially registered at the clinic. The results showed a mean financial loss to the patient of US$ 245 - an exorbitant sum for a village Bangladeshi. Perhaps economic deprivation suffered by TB patients could be used as a measure of success of the programme.
KEY WORDS: HEALTH ECONOMICS; BANGLADESH

171

AU: Chadha VK, Preetish S V & Sanjay Singh
TI: Tuberculosis control and economic issues
SO: NTI BULLETIN 1999, 35, 3-7
DT: Per
AB: The health of its people is reflected in the economy of a nation – healthy people produce healthy economies. It is unfortunate that in our country the effects of ill health on

economy have not been fully appreciated. The burden imposed on individuals, families and the community by disease like TB contains an economic dimension. TB extracts costs – invariably in an economic sense – al all levels of the society, either directly through expenditure incurred in providing health and social care and support, or indirectly in terms of lost opportunities such as loss of employment. Other intangible costs include the anguish and anxiety experienced by the patients and their families. The havoc wrought by TB on individuals, families, whole communities and economies is enormous. Economic issues related to the problem of TB and its control are discussed in detail in the paper.
KEY WORDS: HEALTH ECONOMICS; INDIA

172

AU: Catalani E

TI: Review of the Indian market of anti-tuberculosis drugs : focus on the utilisation of Rifampicin-based products

SO: INT J TB & LUNG DIS 1999, 3 (Suppl), S289-291

DT: Per

AB: There is a need to better understand the extent of the utilisation of Rifampicin in the market, particularly in Fixed-Dose Combinations (FDC). The objective of the study was to review the Indian market of anti-TB drugs, as this is the largest single market in the world of this therapeutic class where about 50% of global consumption of Rifampicin takes place. The study was designed to review and analyse the sales data proffered by the Indian market audit. Estimated data relating to public sector product usage were utilised in order to obtain a more complete scenario.

There are 3 Indian Rifampicin fermentation plants with a total capacity of about 340 metric tons, supplying to the demand of local market and export activities. It is estimated that there was a total consumption of 250-275 metric tons of Rifampicin in 1998. Other raw materials for the formulation of anti-TB drugs such as Isoniazid, Pyrazinamide and Ethambutol are also produced in India for local consumption as also for export. FDCs were particularly produced in India with sales of about US$139 million in 1998 (public sector - $60 million – HMR/India estimate), private sector - $70 million.

Sales for Lupin Laboratories represents 41% of the private market followed by Novartis with a market share of 10%. Rifampicin + INH FDC group is the largest of all anti-TB drug sub groups. Exactly 50% of this market sub-group are represented by the sales of two leading double FDC brand names worth US$25.8 million. Triple FDC (Rifampicin + INH + Pyrazinamide) sales of US$10.4 million are characterised by a large variety of different dosage ratios for the 3 drugs and market leader has the market share of 14%. Two quadruple FDCs sales in India are limited and the AKT FD brand has 87% of this sub-group for the time being. Both the public and private sectors of anti-TB drugs are likely to grow in the future in volume and value and the Indian pharmaceutical industry is very active in the export of raw materials.
KEY WORDS : INDIAN MARKET; RIFAMPICIN; FIXED DOSE COMBINATION; HEALTH ECONOMICS; ITALY.

173

AU: Khatri GR & Frieden TR

TI: The status and prospects of tuberculosis control in India

SO: INT J TB & LUNG DIS 2000, 4, 193-200

DT: Per

AB: Much of the global strategy for TB control was established in India, but every year, there are an estimated 2 million cases of TB. To describe the policies, initial results and lessons learnt from implementation of a RNTCP using the principles of DOTS is the objective of this study. The RNTCP was designed and implemented starting in 1993. With funding from Government of India, State Governments, the World Bank and bilateral donors, regular supply of drugs and logistics was ensured. Persons with chest symptoms who attend health facilities are referred to microscopy centres for diagnosis. Diagnosed cases are categorized as per WHO guidelines and treatment is given by direct observation. Systematic recording and cohort reporting is done. From October 1993 through mid-1999, 146012 patients were put on treatment in the programme. The quality of diagnosis was improved, with the ratio of smear-positive to smear-negative patients being maintained at 1:1. Case detection rates varied greatly between project sites and correlated with the percentage of patients who were smear-positive among those examined for diagnosis, suggesting heterogeneous disease rates. Treatment success was achieved in 81% of new smear-positive patients, 82% of new smear-negative patients, 89% of patients with extra-pulmonary TB and 70% of re-treatment patients.

The RNTCP has successfully treated approximately 80% of patients in 20 districts of 15 states of India. Treatment success rates are more than double and death rates are less than a seventh those of the previous programme. Starting in late 1998, the programme began to scale up and now covers more than 130 million people. Maintaining the quality of implementation during the expansion phase is the next challenge.

KEY WORDS: DOTS; HEALTH ECONOMICS; RNTCP; INDIA.

RNTCP at Bangalore Mahanagara Palike Area

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AU: Chaulk CP, Friedman M & Dunning R

TI: Modeling the epidemiology and economics of directly observed therapy in Baltimore

SO: INT J TB & LUNG DIS 2000, 4 , 201-207

DT: Per

AB: From 1958 to 1978, Baltimore maintained one of the highest pulmonary TB rates in the US. But, from 1978 to 1992 its TB rate declined by 64.3% and its ranking for TB fell from second highest among large US cites to twenty-eighth. This TB trend coincided with the implementation of an aggressive DOT programme by Baltimore's Health Department through city based DOTS, community outreach, home based DOTS by public health nurses. By 1992, nearly 80% of Baltimore patients were treated by DOTS.

Modeling is used to estimate the range of TB cases prevented in Baltimore under DOT. Case estimates equal the difference between the observed number of TB cases in Baltimore versus the expected number if Baltimore's TB trend was replaced by the TB trend for the US (low estimate) or the TB trend for all US cities with over 250000 residents (high estimate). Economic savings are estimated.

It has been estimated that without DOT there would have been between 1577 (53.6%) and 2233 (75.9%) more TB cases in Baltimore, costing $18.8 million to $27.1 million. Cases prevented and expenditures saved increased with increased DOT participation.

This model predicts that Baltimore's TB decline accompanying DOT resulted in health care savings equal to twice the city's total TB control budget for this period. These results are most plausibly due to DOT, since it was the only major change in Baltimore's TB control programme and rising TB risk factors – AIDS, injection drug use, poverty – in a city where TB had been epidemic should have triggered a TB increase as in comparable US cities, rather than the observed decline. As national TB rates continue to decline it will be important to identify ways to capture and reinvest these savings to support effective TB control programmes.
KEY WORDS:; HEALTH ECONOMICS; USA.

175

AU: Norval PY, Blomberg B, Kitler ME, Dye C & Spinaci S

TI: Estimate of the global market for Rifampicin-containing fixed-dose combination tablets

SO: INT J TB & LUNG DIS 1999, 3 (Suppl), S292-S300

DT: Per

AB : The WHO and the IUATLD have recommended fixed dose combination (FDC) tablets containing Rifampicin for TB treatment. However, due to variation in bioavailability of the Rifampicin and quality of Rifampicin in FDCs have prevented their large scale use resulting in lower production and higher prices beyond affordability in developing countries. In this paper, the authors estimate the potential size of the market for Rifampicin containing FDCs assuming that all the currently marketed Rifampicin will be sold in FDCs. The quantity of Rifampicin is estimated by the following equations : the quality of Rifampicin per treatment regimen multiplied by the number of TB cases treated in public and private sector. The future size of the market for FDCs will be influenced by trends in numbers of cases, the ratio of cases treated in the public v/s the private sector and the ratio of cases not treated at all. The future trends of the TB epidemic may be

influenced by several factors such as implementation of control strategy, commitment of government for TB control and the impact of the HIV epidemic. Hence, the authors have decided to provide an estimate of the present market.

WHO collected the information on the use of FDCs in public sector through a questionnaire; 85 countries representing about 90% of the world's TB cases responded to the WHO questionnaire. About 50% of the 85 countries use Rifampicin as FDCs in the public sector, however most of these are small countries. In the public sector, an estimated 23.8% of the total number of notified TB cases are treated with two or three drug FDCs. In the public sector it is estimated that the global amount of Rifampicin used yearly to treat 3.57 million TB cases is 123.7 metric tons, representing 78.9% million tablets of 150 mg Rifampicin or 34 g per TB case. In the private sector, it is estimated that 2.54 million TB cases are treated using 99.9 metric tons, representing 666.3 million tablets of 150 mg Rifampicin or 39 g per case. Thus, the potential global market for the four drug FDC tablet (R-150 mg, H-75 mg, PZA-400 mg and Emb-75 mg) is 305 million tablets per year, 105 and 200 million of which would be distributed in the public and private sectors respectively. The uncertainty of the estimate remains considerable, as shown by the 90% confidence intervals. In conclusion, the study demonstrated a large potential global market for FDCs that should encourage pharmaceutical manufacturers to produce WHO recommended dosages of FDCs at affordable prices. Current use of Rifampicin in the FDCs is only 25% of the total Rifampicin used in the world.
KEY WORDS: DRUG THERAPY; DRUG COMBINATIONS; BIOAVAILABILITY; PRIVATE SECTOR; PUBLIC HEALTH SECTOR; GENEVA.

176

AU: Trebucq A

TI: Requirements for anti tuberculosis drug tender requests

SO: INT J TB & LUNG DIS 1999, 3 (Suppl), S358-S361

AB : As more and more institutions and experts advocate for the use of fixed-dose combinations (FDC) of anti-TB drugs, it is expected that the market will change dramatically in the next few years. Prices should go down, but quality must remain an essential goal for managers in charge of the procurement process. In this paper, general essential requirements for suppliers submitting for competitive bidding are reviewed, in particular the WHO certification scheme. The expiry of patents on older drugs, the diversification of production sites and liberalization of the international pharmaceuticals' market has resulted in multi source generics. These are the only affordable and alternative drugs for low income countries. The main criteria while procuring drugs for the NTP should be price, quality and availability of anti-TB drugs. As in case of other drugs bids for anti-TB drugs should also take into account the specifications such as delay and reliability of delivery. The standard steps in the tender cycle are selection of suppliers to participate in the tender selection and issue of contracts to winning bidders, and monitoring of performance and product quality. The call for suppliers can be made through open tender, restricted tender and direct procurement from single supplier at the quoted price. There is an informal network between authorities, international organizations and NGOs to facilitate the selection of suppliers who qualify the requirements. For quality assurance for drugs, same regulations like Good Manufacturing Practices (GMP), Pharmaceutical product licence (PPL) and the WHO certification

scheme have been introduced from 1963 onwards in many developed and developing countries. The WHO certification scheme is based on voluntary participation of countries that import and export drugs by way of three different certificates. (i) Statement of licensing : it attests that a PPL has been issued by the regulatory authorities of the exporting country for use by importing agents; (ii) Certificate of a pharmaceutical product issued by the competent national regulatory authorities of the exporting country; (iii) Batch certificate – the manufacturer issues this certificate for each individual batch of a pharmaceutical product. It is a mandatory requirement and is provided with the bidding documents. It attests the quality and expiry date of a specific batch and should include the specifications of the final product. The cost of FDCs are likely to go down and would become accessible for the programme. For the NTP, different combinations of specified formulations of three or four drug combinations are recommended and can be made available on the basis of making request for the type of combination and dosage for each product. A contract taking into account of all the details of the drugs and of the services (labeling, packaging, shelf life, expiry dates, bid bonds, shipment specification, penalties for default) need to be signed between the provider and purchaser. Quality control of FDCs is essential. Bio-availability studies must be conducted for rifampicin according to the protocol recommended by the IUALTD and the WHO, whereas for other components dissolution tests are significant. This should be made as condition before bidding or before supply. Management of competitive tenders is an important and difficult task. Low prices and high quality drugs must be the result of this process in order to procure good drugs for TB patients.

KEY WORDS: HEALTH ECONOMICS; FIXED DOSE COMBINATION; DRUG TENDERS; BIOAVAILABILITY; FRANCE.

No.of records: 13