Infection with the mycobacterium tuberculosis (tuberculosis) constitutes a major public health challenge worldwide. The World Health Organization (WHO) estimated that tuberculosis is responsible alone for the death of 3 millions and the illness of some hundred millions more annually. Projections for the year 2020 showed that if current transmission dynamics are not interrupted, the toll of tuberculosis morbidity will mount to one billion cases. This has placed tuberculosis among the most serious known threats for human survival and well-being worldwide. The burden of tuberculosis infection varies greatly among developed and developing countries as well as among developing countries themselves. For example, the WHO identified 25 countries as heavily struck by the tuberculosis misery. Pakistan, a low income country in the Indian subcontinent, came sixth in this list.

The toll of tuberculosis in Pakistan was estimated recently to be in the magnitude of 270 thousand new infections and 50 thousands death annually. These figures are higher than those reported decades ago and show that the morbidity and mortality from tuberculosis have been increasing in the country. This runs against the expectations that the national tuberculosis control program (NTCP) – which has been run by the Ministry of Health since 1985 - has had an impact on tuberculosis in aspects like prevention, early detection and treatment. Unfortunately this has not been the case.

This study comes as an attempt to assess and evaluate the performance of the tuberculosis national control program in Pakistan. A task which has not be undertaken in Pakistan so far. The goal is that through a systematic review of the aspects crucial to the success of the program, the study can identify problems hindering the program performance and suggest solutions to overcome these problems. Therefore the study was intended to have a descriptive as well as a prescriptive scope of analysis. Furthermore, the study addresses the different levels for the NTCP activities, including central, district and community levels.

The study was carried out using a hybrid methodology coupling quantitative and qualitative research methods and encompassed a cross-design synthesis. To simplify the
presentation of the research undertaking, the different components of the study along with the goals and the methods used for each component are addressed in 5 chapters.

The first chapter encompasses a review of the epidemiology and control of tuberculosis in Pakistan and other developing countries. The review lays the theoretical foundation for the whole research undertaking and its methods. These methods are presented in details in the second part of the chapter.

The second chapter addresses the performance of the NTP at the central (ministerial) level. It gives a brief chronicle of TB control in Pakistan along with a detailed assessment of the control strategies, planning and management styles, financing patterns and monitoring and evaluation schemes, which are currently used by the NTCP. The results of the key informant interviews with the key ministerial officials are presented and analyzed. A detailed account is then given about the strengths, resources and shortcomings of the program. Five main problems have been identified by the review:

- There is a low level of political commitment to tuberculosis control activities,
- The NTCP is centrally organized and being run as a vertical program,
- Financial resources allocated for the tuberculosis control activities are less than enough,
- The level of manpower is not sufficient for the planning, management, monitoring and evaluation activities of the program,
- There is no clear description of the roles and responsibilities of the central and peripheral levels for the supervised treatment and for the various departments within the Ministry of Health that are concerned with the tuberculosis control activities.

Chapter three is dedicated to the performance of the NTP at the health facilities level. It presents for the results of the health facility survey that aimed at assessing the coverage, human and financial resources, efficiency and effectiveness of six selected tuberculosis control facilities. The assessment addressed the case management protocols in these facilities and checked for their compliance with the WHO-recommended Directly Observed Treatment; Short course (DOTS) strategy. The survey revealed the following results:
The existing facilities can provide a very limited coverage for tuberculosis patients, irrespective of the quality of services that are currently being provided by these facilities.

There is a severe shortage of the inputs and resources available to these facilities. This applies to the human resources (doctors, nurses and other health care workers) and financial resources. The salaries of the staff constitute the majority of the limited financial resources allocated to these facilities, with little money left to the provision of drugs, maintenance and medical equipment. This has led to a serious deterioration of the quality of services.

There is a state of fragmentation in the control policies and case management strategies employed by these facilities. None of the facilities adheres to the DOTS strategy. There was no case management strategy in the public facilities. Facilities supported by international relief and charity organizations followed the case management strategies of the donor country.

There is no coherent communication strategies to educate the patients in the health facilities or to check for their adherence for the treatment. These two problems explain partly the high rate of defaulters among patients receiving treatment in these facilities.

Surveillance and management information systems are lacking in these facilities.

The fourth chapter addresses the patterns and determinants of adherence of TB patients with the treatment. Adherence was assessed in 621 TB patients using a structured interview form. This was supplemented by focused group discussions with 60 chronic interrupters. Interruption of the treatment was reported in 82% of the cases. The multivariate regression analysis identified the socio-economic, cultural and environmental factors associated with treatment interruption. It was shown that women and children are in a special risk of interrupting the treatment.

The fifth chapter discusses the results of the study and draws recommendations for improving the performance of the NTP in Pakistan. The chapter comes to the conclusion that a great deal of political commitment is required as a start-up prerequisite for improving the program performance. The DOTS strategy should be adopted as the national case management strategy along with putting in place strategies to improve the performance of the health care workers, ensuring that tuberculosis drugs are available at the peripheral levels. Decentralization of the NTCP is required by giving provincial and district levels greater roles in planning and management of tuberculosis control activities.
Culturally sensitive communication and education strategies should be developed and implemented to improve the family and community practices with respect to care seeking and adherence to the treatment.

Finally, this research undertaking was an attempt to provide a comprehensive but not an exclusive assessment of the program activities. It is important to remember the methodological, sampling limitations and the quality of data obtained from research in developing countries. However, it is meant to be a start point and hoped to spark greater participation of academicians and scientists in Pakistan to eradicate this human misery in the coming years.
GLOSSARY

ARI: Acute respiratory infections
BCG: Bacilli Calmette-Guerin
BHU: Basic Health Unit
DALYs: Disability Adjusted Life Years
DHA: District Health Authorities
DHQ: District Head Quarter Hospital
DHS: District Health system
DMO: District Medical Officer
DOTS: Directly observed treatment, short course strategy
DOTS: Supervised treatment strategy; short course
DPHO: District Public Health Officer
DST: Drug Susceptibility testing
DTO: District Tuberculosis Officer
EMRO: Eastern Mediterranean regional office
EPI: Expanded program of immunization
EPI: Expanded Program of Immunization
ESR: Erythrocytes sedimentation rate
FGDs: Focused Group Discussions
FMP &D: Federal Ministry of Planning and Development
GLTBCA: German Leprosy and TB control Association
GTZ: Deutsche Gesellschaft für Technische Zusammenarbeit (German Foundation for technical development)
HDS: Health Development Structures
HFS: Health facility survey
HSMS: Health Service Management Structures
ICD: Italian Co-operation for development
IUATLD: International Union Against Tuberculosis and Lung Diseases
MALC: Marie Adelaide Leprosy Center
MCH: Mother and child health
MOH: Ministry of Health
MOTS: Monthly Observed treatment strategy; short course
MSU: Multi Donors Support Unit
NHW: National health workers
NHWs: National Health Workers
NTP: National tuberculosis control program
NWFP: North Western Frontier Province of Pakistan
PHC: Primary health care
PPs: Private Practitioners
PPM: Public-private Mix
RHC: Rural Health center
SAPP: Social Action Program Project
SDPs: Service delivery points
SRCA: Saudi Red Crescent Association
STDTC: State TB Demonstration and Training Centers
WDR: World Development Report
WHO: World health organization
WOTS: Weekly Observed treatment strategy; short course
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