Urging Health System Research: Identifying Gaps and Fortifying Tuberculosis Control in Pakistan

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Aim. To assess the significance of health system research in reducing the burden of tuberculosis and improving the performance of National Tuberculosis Control Program in Pakistan.

Method. Qualitative and quantitative content analysis of research papers on tuberculosis and influence of the research knowledge on the efficiency of the National Tuberculosis Control Program.

Results. We analyzed 268 research papers on tuberculosis in Pakistan published in the 1960-2002 period, from both national and international perspectives. The majority of the studies covered epidemiology of tuberculosis (n=76) in Pakistan, whereas the rest of the papers addressed issues like pediatric tuberculosis (n=53), tuberculosis among Pakistani immigrants (n=35), tuberculosis-HIV synergism (n=24), care seeking (n=19), adherence with tuberculosis treatment (n=14), tuberculosis among women (n=12), tuberculosis prevention (n=12), directly observed treatment short-course (DOTS) strategy modification (n=5), tuberculosis drug resistance (n=7), operational research (n=5), tuberculosis case management (n=4), and research on Mycobacterium (n=2). Qualitative analysis revealed that research and spending on tuberculosis policy and nationwide tuberculosis interventions are not sufficient. Available research knowledge has not yet been translated into the tuberculosis policy and interventions. Furthermore, the lack of insight of the health system on community dynamics and tuberculosis intervention has led to failure in achieving the desired targets in tuberculosis control.

Conclusion. Health system in Pakistan needs to improve tuberculosis control interventions by conducting extensive research on the various potential weaknesses in the field. For an effective tuberculosis eradication program in a highly endemic country such as Pakistan, health system research should be an integral part of the National Tuberculosis Control Program.

Key words: community health planning; forecasting; Pakistan; publications; research; tuberculosis

The burden of tuberculosis and deaths due to the disease in Pakistan is alarming. With the population of 152 million, Pakistan is one of the 22 highly endemic countries and ranks currently fifth on the list of high-burden countries (1,2). Pakistan contributes 44% to the total burden of tuberculosis in the Eastern Mediterranean countries (2-4). The situation is constantly escalating as mortality due to tuberculosis exceeds 50,000 annually. The total number of new tuberculosis cases in 1999 was estimated at 269,000, which was equivalent to 177 per 100,000 inhabitants (1-7). On the other hand, it is estimated that only 5.2% of smear-positive cases are notified each year (1). The trend of priority setting and research efforts focusing on disrupting the propagation of infection by effective treatment, prophylaxis, and preventive measures is fairly static in Pakistan (7,8). Of growing concern are the large pockets of undetected cases of tuberculosis and those in close contact with them in the population that has no access to health care or does not seek it (1-4). Furthermore, policy making and research on tuberculosis in Pakistan are not effectively linked. There are wide gaps between the health system research, which is in embryonic stage, and the increasing burden of infectious diseases (4-6,7,13). In particular, the burden of disease study in 2000 (4) and the epidemiological reports of World Health Organization (WHO) for Pakistan (1) have developed critical apprehensions about the future forecast of this major health risk.

National Tuberculosis Control Program is confronted with diverse challenges related to the health system, community, and communicable diseases interventions, and its failure to gain a strong hold over the communicable diseases is attributed mainly to the lack of research knowledge of the health system and its possible inclusion in the interventions (1-4). Also, potential reasons underlying the retarded perfor-
mance of tuberculosis control program have received allegedly little attention from the researchers, policy makers, and managers (1-12). Meanwhile, it is strongly believed that the reservoir of tuberculosis infection exceeds the capacities and resources available (3,6,13,15-21). According to the WHO global surveillance, all the 22 high-burden countries have to adopt directly observed treatment short-course (DOTS) strategy and health system research as basic strategies to meet their targets and attain absolute control over tuberculosis (1,5). Health system research, which can improve the impact of tuberculosis control program, is still not addressed by the health system in Pakistan. Similarly, the infectious disease control in Pakistan demands an abrupt attention and adequate intervention. The approach of the National Tuberculosis Control Program has been dogmatic and blind to its potential programmatic, organizational, and managerial shortcomings. Before tuberculosis control program can be attuned with the WHO’s standards, operational and community research has to be performed to thoroughly explore and identify the problems.

To put the increasing tuberculosis caseload under control, control interventions need to be tailored, thoroughly assessed, appropriately planned, and effectively implemented. Establishing a research trend and promoting health system research on the gaps in the health system and alleged barriers in the National Tuberculosis Control Program are crucial for improving tuberculosis control in the country. Our aim was to assess the research profile in Pakistan, especially with respect to the current performance of National Tuberculosis Control Program and past research trends. We also critically appraised the level of commitment to research and its impact on tuberculosis control, provided insight into the deficiencies of the health system, and pointed out the importance of health system research as a key component in future health planning and designing interventions in Pakistan.

Method

We performed qualitative and quantitative content analysis of research work on tuberculosis, tuberculosis control interventions, and key documents on tuberculosis policy in Pakistan. We searched MEDLINE to sort out papers published in the 1965-2002 period. With reference to Pakistan, literature was retrieved including papers, excerpts, transcripts, and reports on health system research activities of other institutions. Howev-

Results

Chronicle of Tuberculosis Control Research

Except two historical surveys in 1961 and 1978, periodic tuberculosis surveillance in Pakistan has been rarely practiced (3). Pakistan’s efforts to control tuberculosis started back in 1965, but programmatic flaws, lack of financial resources, and non-existent political backup seriously undermined the sustainability of tuberculosis control activities. National Tuberculosis Control Program was eventually suspended in 1985 and country remained without any tuberculosis program for about a decade. Realizing the seriousness of the situation, Pakistan revised its National Tuberculosis Control Program in 1994. Nevertheless, there were constraints in DOTS implementation and they became evident by 1999.

Research gaps widened as the time elapsed, and the inclusion of medical research into the Sixth 5-year Plan of Pakistan for 1983-88 was of crucial importance (22). National Clinical Research Institute was established to conduct research in national health problems and provide guidance for improving the primary health care program. Great emphasis was placed on establishing research centers as teaching institutions, on creation of a cadre of medical researchers with an appropriate career structure, and on health services research with involvement of planning and executing agencies and academia. Unfortunately, research initiative over the following Sixth, Seventh, and Eighth 5-year Plan did not yield a satisfactory outcome (6,10).

There are few research-oriented institutions in Pakistan. Pakistan Medical Research Council, National Institute of Health in Islamabad, and the Agha Khan University of Health Sciences in Karachi in the private sector were the first institutions with some research-oriented initiative. Pakistan Medical Research Council, established in 1956, aimed to initiate, promote, and strengthen medical research and coordinate research activities of other institutions. However, these intentions were largely hampered by abrupt reduction in the budget of National Scientific Research and Development Board.

Quantitative Analysis – Availability, Quality, and Validity of the Information on Tuberculosis in Pakistan

By searching medical literature included in the MEDLINE database of the United States National Library of Medicine, we collected and reviewed a total of 268 research studies on tuberculosis in Pakistan published in both local and international sources in the 1965-2002 period. WHO’s reports, articles, editorials, short contributions, letters, and research papers were included in the review and categorized according to the number and research areas addressed. Most studies were on the epidemiology of tuberculosis in Pakistan (n = 76), whereas the rest of papers addressed issues like pediatric tuberculosis (n = 53), tuberculosis among Pakistani immigrants (n = 35), tuberculosis-HIV synergism and screening (n = 24), care seeking (n = 19), adherence with tuberculosis treatment (n = 14), tuberculosis among women (n = 12),
tuberculosis prevention (n = 12), DOTS modification (n = 5), tuberculosis drug resistance (n = 7), operational research (n = 5), tuberculosis case management (n = 4), and research on Mycobacterium (n = 2) (Table 1). The overall trend of publishing research papers in Pakistan gained its momentum in early 1990s.

Locally published research papers were mostly anecdotal. Their sample sizes were very small, tools inadequate, results biased, and they left significant areas of tuberculosis control unexplained. Moreover, operational research, basic medical research, research on the synergism of HIV/AIDS and tuberculosis, on community modes of infection and transmission, and on the efficiency and effectiveness of the interventions were rarely done. Investigations into increasing mortality and morbidity of women and children and responsiveness of tuberculosis care towards the two most vulnerable groups were scarce, as well as studies on patterns in care seeking, treatment adherence, case management, and prophylaxis of tuberculosis. On the other hand, studies showing tuberculosis among the Pakistani immigrants overseas were the most numerous (1,26-30).

**Qualitative Analysis**

The qualitative part of our assessment provided insight into the issues that impact the orientation of health system towards research. In Pakistan, Federal Government, assisted by the health departments, creates health policy and makes key decisions on health care planning. Since institutional accreditation of research and its incorporation in health care system are not widely accepted at the health departments, the decision-making hierarchy usually oversees the scarcity of research-guided interventions and rarely allocates the funds for such initiatives. This greatly undermines efforts to launch nation-wide research-based surveillance that could explore ways and means to improve the quality of care and use resources in a more effective way. In the existing system of policy making, there is a risk of negligence of community interest or a lack of understanding of the community perspectives. Pakistan is a low-income country, with less than 2.7% of gross national product (GNP) invested in the health sector and only 0.2% of the GNP allocated to research (1,6). Although the targets set in the revised version of National Tuberculosis Control Program from March 2000 Amsterdam Declaration (11) were 100% tuberculosis coverage by the year 2005; detection of 70% of all cases and 85% for successful treatment; and 50% reduction in prevalence of and deaths due to tuberculosis by 2010 (1,2), no specifications for research have been made so far and several questions arise how to achieve this extent of coverage in the given time period. To respond to the issue of tuberculosis control, a great deal of research is needed to provide broad-based scientific insight into the country’s vital issues.

The World Health Report 2000 ranked Pakistan’s health system among those with the poorest responsiveness to the priority health issues and farthest from attaining overall health targets. Pakistan’s position was 124th and 183rd regarding the level and distribution of health, respectively; 121st and 115th regarding the level and distribution of responsiveness, respectively; 63rd regarding the fairness of financial contribution; 133rd regarding the overall goal attainment; 142nd regarding the health expenditure per capita; and 122nd regarding the overall health system performance (12). Knowing the fact that only one in four tuberculosis cases is properly managed, WHO has been urging Pakistan to take steps in responding to the gaps and deficits in the tuberculosis control program (1-7,11,12,22). However, fatal shortcomings specific to the tuberculosis control program are still ignored. Fragmented approach to tuberculosis case management has increased the number of defaulter, relapse, and resistant cases among women and children (13-20). A wide array of variations in the prescriptions (un-standardized) exists in both private and public sector (1,3,16-21). National Tuberculosis Control Program is unaware of the large number of cases detected and treated in the private sector (7). HIV/AIDS and tuberculosis surveillance is non-existent (1,3,14,15). Case finding is poor, although the number of refugees from Afghanistan – a highly endemic country – has reached millions, and the component of community participation in improving the efficiency of interventions is neglected (13). Community and behavioral dynamics are unexplored. Although DOTS is universally recommended by WHO as one of the most cost-effective and potent tuberculosis interventions for tuberculosis control, the experience has shown that DOTS could not be imple-
mented as such in many developing countries, including Pakistan, without being modified and adjusted to the needs and specific situation in the country concerned (1,3,18-21,24). It is estimated that 1% of new tuberculosis cases in the country have HIV co-infection and that large number of HIV/AIDS cases are missed or not reported due to the lack of appropriate diagnostics. In spite of a decade old National Tuberculosis Control Program, cumulative figures on the actual magnitude of multi-drug resistant tuberculosis and successfully treated and cured cases have not been available so far.

**Discussion**

Our analysis showed that key issues in health system and especially in the tuberculosis control in Pakistan have been out of the research focus. There is also a great lack of research in community dynamics, care seeking among the vulnerable groups, case management, modes of resistant tuberculosis, and operational research. The fact of the matter is that tuberculosis interventions and health care in particular need drastic overhauling, for which scientific research is mandatory. Based on the information acquired by our analysis, we designed a model which denotes the key points for research interventions at various levels in a high burden country (Fig. 1).

In 1986 WHO Report on Health Research Strategy it was stated that the aims of Health for All treaty could not be achieved as long as the problems in the health system were not adequately addressed. Challenges, barriers, and gaps should first be identified by the use of research tools, and then dealt with on the basis of priority and severity (5). Although Pakistan has adopted WHO’s global strategy of Health for All (14), decisive steps to achieve desired targets have not been taken yet. Reliable information on epidemiological transition is scarce and that obtained from various conventional outlets, e.g., tuberculosis registers or population and housing surveys, has not been systematically processed, analyzed, and used to fine-tune the health system performance. Research-oriented institutions and activities are more or less isolated and international collaboration is extremely weak, which slows down scientific and research evolution in Pakistan (5-10). An intellectual environment in the country’s academic institutions conducive to attract those interested in research is direly lacking and the amount of resources allocated to health system research is negligible.

Clinical and laboratory research may not only help decision-makers and health managers to formulate a public health strategy, but also confirm the existence of disease and help combine the strategy for disease prevention with community research and intervention research accordingly. It is, therefore, necessary to emphasize clinical and laboratory research within the health system research in general (6). To rejuvenate research activities, National Tuberculosis Control Program must launch an operational research committee composed of National Tuberculosis Control Program managers, epidemiologists, and international experts, who would provide a forum for debating research priorities targeting specific problems at front level (6-9).

Countries like Brazil, Peru, China, and Malawi attained unprecedented success in tuberculosis control by health system reforms, research-based planning and its implementation in the tuberculosis control (1). In Malawi, health system research not only revolutionized tuberculosis policy, but also assisted in putting adequate reforms in place. An active coordination between the academic institutions and research agencies greatly improved tuberculosis control. In conclusion, there is a strong urge for both public and private health sectors in Pakistan to incorporate research into their mission. Once potential areas of weaknesses and barriers are identified, targeting them will become easier. The National Tuberculosis Control Program planners, managers, and implementers have to be given enough opportunities to make research-guided decisions and planning. International research institutions should closely work with the local one, attracting intellectuals by offering

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**Figure 1.** Possible points of research interventions in tuberculosis control. DOTS – directly observed treatment short-course.
them decent incentives will certainly improve the disease prevention and health promotion in the country.

References

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