

# **Stop Tuberculosis Infection of Healthcare Workers in Anti-TB Institutions: One Case of Bridging the Research–Policy Divide**

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## **Introduction**

Tuberculosis (TB) is an air-borne infectious disease with a long history. The prevalence of TB presented a decreasing trend since some effective anti-TB drugs were invented and used in the 1940s. However, owing to HIV, multidrug resistance and migration, TB has been resurging since the 1980s. In 1993, the World Health Organization (WHO) declared tuberculosis a global emergency. In order to stop the epidemic of TB, since the 1990s the strategy of directly observed treatment and short-course therapy (DOTS) has been recommended.

In 2007, there were 13.7 million prevalent cases and 9.27 million incident cases occurred worldwide as estimated by the World Health Organization (WHO). Among the prevalent cases, 0.5 million patients were multidrug-resistant TB (MDR-TB). By the end of 2008, 55 countries and territories had reported at least one case of extensively drug-resistant TB (XDR-TB). TB still is one of the greatest threats to the public health. China is one of the 20 countries with a high-TB burden worldwide. TB is one of the infectious diseases that Chinese government focuses on to control. Since the late 1970s, the National TB Program has been implemented. Since the early 1990s, the strategy of DOTS has been introduced.

Henan is an economically undeveloped province located in the central part of China with the largest population of any province. There are approximately 10% of all China's TB patients distributed in Henan province. Since the mid-1990s, the policy of TB case-convergence has been implemented and all pulmonary TB and suspected TB patients must be transferred to anti-TB institutions (anti-TB hospitals or anti-TB clinics) for detection, diagnosis, treatment and management.

## **For what and for whom**

In China, the anti-TB institutions are responsible for the TB control and prevention work including TB detection, diagnosis, treatment and management. The healthcare workers, especially the doctors and nurses, in anti-TB institutions come into contact with many infectious TB patients every day and are exposed to a high risk of TB infection. The health care workers are more inclined to get the infection in the working place with a poor vocational protection. If a healthcare worker suffers from TB, it will not only damage his or her health, but also tends to spread TB infection to the patients who are seeing a doctor and other healthcare workers in anti-TB institutions. Furthermore, this may result in the spread of TB in their family and the community. In addition, the healthcare workers are a rare

human resource for TB control work and if their health is threatened, the whole TB control work will be affected and the government needs to spend more money on the human resource for TB control work.

The main purpose of providing research support to policy was to improve the health of healthcare workers and other employees in the anti-TB institutions and the TB vocational protection, and reduce the spread of TB among the staff and the patients in anti-TB institutions and the community residents.

TB is one of the infectious diseases which the government focuses on because the TB control work in China has been confirmed to be a more cost-effective health intervention. It is one indispensable part to stop TB spread in anti-TB institutions. Not only the healthcare workers and the patients but also the anti-TB institutions, the communities and the government would benefit from the policy.

### **Relevant research**

In 2001, a three-year study in Australia, reported in the Medical Journal of Australia, found healthcare workers were almost six per cent more likely to test positive to the infection than non-healthcare workers. In 2005, a study in Samara of Russia reported that the incidence rate of TB disease among health care workers of anti-TB institutions was 10 times higher than that among the general population. In 1994, the Center for Disease Control and Prevention of the United States of America (CDC) published the Guidelines for Preventing the Transmission of Mycobacterium tuberculosis in Health-Care facilities. The implementation of the guidelines in the USA has reduced TB outbreaks and the transmission of TB to patients and healthcare workers in health-care facilities. In 2005, the CDC of USA updated the guidelines and issued the Guidelines for Preventing the Transmission of Mycobacterium Tuberculosis in Health-Care Settings, 2005.

In 2003, I wrote a proposal about conducting a survey on the infection and incidence of healthcare workers and vocational protection in Henan provincial anti-TB institutions to the Foreign Loan Division of the Health Ministry of China. In 2004, the proposal was assessed by the committee for operational research of China's national TB control program and most experts of the committee are still the members of the expert committee of the China's Ministry of Health. The committee advised the Foreign Loan Division of the Health Ministry of China to authorize the research. Finally the research proposal was accepted and authorized to conduct with financial support from the TB Control Project of China Loaned by World Bank. Then, the survey on the infection and incidence of healthcare workers and vocational protection in Henan provincial anti-TB institutions had been done in 2005 and found that TB infection rate of the healthcare workers in anti-TB institutions was 1/3rd higher than that in the general people in Henan, especially much higher in doctors and nurses, and the TB infection control in anti-TB institutions in Henan was weak. In order to effectively reduce TB infection of the healthcare workers in the anti-TB institutions, some policies need to be formulated to stop the spread of TB in the anti-TB institutions and protect the health of healthcare workers and patients.

## **The policy system targeted**

In China, there is an effective anti-TB system. The anti-TB system includes a big three-level network and a small three-level network, which covers the whole country. The big three-level network consists of a national anti-TB institute, province-level anti-TB institutes and prefecture-level institutions. The small three-level network consists of county-level institutions, township-level health centers and village clinics. From the province level to the county level, all anti-TB institutions are supervised by the health departments of local governments. The anti-TB institution at higher level is responsible for providing technical instructions and training to the anti-TB institutions at lower level. The anti-TB institution at each level provides policy advice for the health department at same level so that the health department can make corresponding policy for reference. At each level there is a TB expert committee or group who serve as the advisors for the policy making of the health department. Usually the committee or group plays an important role in the policy making. The experts in the national TB committee come from anti-TB institutions, general hospitals, universities nationwide and the experts in the provincial committee come from anti-TB institutions, general hospitals and universities in the province, but most of them from the same level anti-TB institutions.

The anatomical parts of the policy system targeted in my case included Henan Provincial Anti-TB Institute, Henan Provincial Center for Disease Control and Prevention and the Health Department of Henan. Because the research was based on Henan Province, we wished that the Health Department of Henan issued such policy, but it will be better for the Health Ministry of China to issue such policy because the policy issued by the Health Ministry of China would have more power and the research was authorized by the Health Ministry of China. Furthermore, the survey results should be representative of the whole country because Henan is the province with the largest population, a middle-level economy and the most anti-TB institutions and healthcare workers involved in TB control work. We have no direct connection with the Health Ministry of China on business, but we have the direct connection with the National Anti-TB Institute on business which is responsible for providing the technical instruction for the provincial anti-TB institutes, including Henan Anti-TB institute, which has many national-level experts playing an important part in the national policy-making of TB control work. Therefore, the National Anti-TB Institute was listed in the important part of policy system targeted as well.

## **Who and how**

In April 2005, one member of our team gave a presentation about the primary survey results in one meeting held in Beijing, in which some officials from the Health Ministry of China some experts and doctors from the National Anti-TB institute and provincial-level anti-TB institute was present. After our team finished the research report in 2006, I sent the research results and policy advice to my director of Henan Provincial Anti-TB Institution of Henan Provincial CDC and other doctors in Henan Provincial Anti-TB institute. After my director signed the research report, it was sent to the Vice Director of Henan Provincial Center for Disease Control and Prevention and the director of the Disease Control Division of Henan Provincial Health Department. Since the research was authorized by the Health

Ministry of China and the National Anti-TB Institute of China's Center for Disease Control and Prevention, after the report was signed by the director of Henan Provincial Center for Disease Control and Prevention, it was reported to the National Anti-TB Institute of China's CDC and the Foreign Loan Office of the Health Ministry of China as a written official document. In addition, I also had a talk with the other doctors and my director about the research results and the necessity to make the policy to stop the TB spread in the anti-TB institutions personally. In 2006, according to the research results, we had written three papers and submitted them to three Chinese journals. In 2007 the three papers were accepted and published in the Chinese Journal of Epidemiology, the Chinese Journal of Public Health and the Henan Journal of Preventive Medicine. In China, before one paper is published, the editor needs to send the paper to some anonymous experts for a peer-review. These three papers had all been revised according to the opinion of the reviewers before being published. Although we did not know the names of the reviewers, in general the reviewers invited by scientific journals are famous experts.

I am a senior epidemiologist of Henan Provincial Anti-TB Institute, Henan Provincial Center for Disease Control and Prevention. I have been involved in TB control work and its research in Henan since 1997 and due to the duty of the work I often go to the prefecture-level and county-level anti-TB institutions and contact a number of healthcare workers in the various-level anti-TB institutions. In the early 2000s, when I learned several healthcare workers had been infected with or suffered from TB, I was thinking that it was very necessary to do the survey because I knew that if you want to make some related policies, you need enough and reliable evidence. In the early 2003, I began to search and read the related literatures, and then wrote the proposal for the survey. After the research was authorized, as the principal investigator, I was responsible for the whole research work. In 2006, as the principal investigator I was informed to give a presentation about our survey results and policy advice in a meeting held in Beijing in which some officials from the Health Ministry of China, some vice-directors and some experts from the National Anti-TB Institute of China CDC and the provincial-level anti-TB institutions attended. Some experts and vice-directors were the members of the expert committee of the Health Ministry of China. Approximately forty people attended the meeting. I also personally had a talk with a famous TB expert in Henan about our research results and the necessity to enforce TB infection control work in anti-TB institutions who is a member of the Expert Committee of the Health Ministry of China for TB Control Work. He always attends the meeting of the expert committee. He is also the former director of mine and before I had been participated in several research projects he was responsible for. In 2007 one member of our team wrote a thesis for her master degree using a part of the survey results and presented it in the meeting held by the academic degree committee of Shandong Medical University, a prestigious university in a coastal province of China. In July 2008, the anti-TB society of China held a competitive activity to select an excellent survey. In order to enlarge the impact, we sent the research report to join the activity.

The stages model could help us to understand this process to bridge the research-policy divide. The activity followed seven stages. Firstly, we identified the issue through the survey that TB infection of healthcare workers in anti-TB institute is higher. Secondly, the policy analysis was done. We analyzed the survey results, compared the overseas relevant

research, connected the problem with SARS control and put forward the potential solutions and advice. We tried to provide sufficient information to the decision-maker as reference. Thirdly, we sent the report and its abstract to the decision-makers, the government, and wished the health department to issue the policy to stop TB in anti-TB institutions as an official written document so that all anti-TB institutions and healthcare workers could follow it. Fourthly, we did some communication with some officials, experts and our colleagues about the research results and solutions. With the communication the feasibility of the solutions has been improved and with the communication we tried to have our research results and policy advice promulgate as extensively as possible, especially want to keep the informed experts as many as possible because some experts usually are the objects that the decision-makers consult. We did not participate in the process of coordination and decision making, but my colleagues and I have been participating in the implementation. I think maybe in the future we will be involved in the evaluation. Through the evaluation, the policy will be revised and updated. I believe that TB infection and incidence rate of healthcare workers will be reduced in the near future and finally the spread of TB in anti-TB institutions will be completely stopped.

### **Important contextual factors**

As the discussion notes in the introductory section above, TB is becoming a challenge of public health worldwide, including China. In 2003, the outbreak of SARS shocked the whole country and had the public recognize that infectious diseases were still very important problems of public health. After the outbreak of SARS, the public health work, especially infectious disease control work, has been paying high attention to in China. The governments at all levels increased the budget for the control work of infectious diseases and the improvement of the work conditions of the institutions of infectious disease control. The TB control work was not an exception. The resources used for TB control work like budget and new policy have been increasing significantly since then. In 2005, for the first time the targets for TB control work required by WHO, 100% DOTS coverage rate, more than 70% detection rate and 85% cure rate, were all met with many efforts in China including Henan, which brought much inspiration for TB control work. Since then, the TB control work was developed in-depth in many areas such as TB control work in immigration workers, in HIV-positive populations and so on.

The survey of our research was carried out in 127 anti-TB institutions including 18 prefecture-level anti-TB institutions and 109 county-level anti-TB institutions. 2153 employees had been interviewed and given the TB-related tests. In order to guarantee that the survey could be conducted successfully with high quality, my director and some officials of Henan Provincial Center for Disease Control and Prevention and the Disease Control Division of Henan Provincial Health Department offered a lot of support in respect of organizing and coordinating the process. The survey protocol had been issued with an official document by Henan Provincial CDC so that each anti-TB institution could follow it strictly and accurately. Before the start of the survey, a training meeting had been held in Zhengzhou, the capital of Henan Province. The vice directors, doctors and nurses who would be responsible for the field survey in the prefecture-level anti-TB institutions attended the meeting and received the training. In order to guarantee the quality of the survey, a

technical group had been established. During the process of the survey, the members of the group went to survey field for supervising and checked up the questionnaires. My director, the head of Henan Provincial Anti-TB Institute as a member of our team, played an important role in facilitating the survey conducting and the research impacting because he has more connection with the Health Department of Henan, the National anti-TB Institute, and even the Health Ministry of China due to his higher position. By the way, before assuming his current position, he had served as the vice director of the Disease Control Division of the Health Department of Henan. He gave a strong support to carry out the research and translate the research into the policy.

## **Outcome**

In December 2008, a draft of the new guideline for the National TB Control Program was issued and it included the policy of infection control in anti-TB institutions. The new guideline will be issued officially by the Health Ministry of China very soon. In fact, the staff of anti-TB institutions at all levels has received the training of the new guideline and it was informed that the new guideline has been implemented all over the country since January 1, 2009. The issue of one new policy is associated with many impacting factors and sometimes one research is not evidence-based enough to make a new policy, however any related research is helpful to make a new policy. Some experts and some directors of anti-TB institutions who read our research report or listened to my presentation participated in the drafting new guideline. Furthermore, besides our research, there isn't other related research reported in China up to now. Therefore, I guess that the research work of our team and what our team did should play some role in it.

However, I don't think that our actions were completely successful because although our team and our institute did some communication with some experts or the government department, the communication was very limited and sometimes it was in a passive way. If our team or our institutions could do sufficient and effective communication with the main stakeholders in a more active way, I think the policy would have been issued and implemented earlier in China, at least in Henan province. In addition, we ignored the effects of some stakeholders such as the healthcare workers at the prefecture-level anti-TB institutions and county-level anti-TB institutions. We should have offered feedback on the survey results, but we did not do it in spite of having a chance owing to lack of a specific and detailed action plan. If we had done it, we would have won more strong voice of support because this group was maximum direct beneficiaries.

## Conclusion

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These case studies reflect the disciplinary backgrounds of their authors with some addressing problems in the area of environmental sustainability, some public health and others community development or social action. Common threads are 1) the use of the five point Integration and Implementation Sciences framework as both a tool for analysis and a means for structuring the case studies and 2) the use of theories of the policy process to aid understanding of the policy system in which the research influence activity took place, and to explore how research influenced policy in those instances.

The cases were written over a five-week period. Four or five drafts were produced, and each was commented upon by the author's peers and by course faculty. This feedback was incorporated into subsequent drafts. The early drafts were prepared before the authors had gained a comprehensive understanding of the Integration and Implementation Sciences framework, and after only a preliminary exposure to models of the policy process. Subsequent drafts, however, reflected the increasingly deeper understanding in both these areas that developed during the course. In particular, grasping the concept of the policy system and developing skills at analysing it<sup>3</sup> was a challenge for most of the authors at first but their successes in this area are demonstrated in the appropriate sections of all six cases studies. Another area in which substantial improvements were demonstrated from the earlier to the later drafts was the authors' systematic analysis of the tools and processes used by the researchers to influence people engaged in policy activity. This is the 'Who' and 'How' component.

With regard to the use of the policy frameworks, theories and models, a number of the authors found the stages model (also known as the policy cycle model) to be particularly useful.<sup>4</sup> Although they grasped the significant limitations of this model, especially that it does not describe how policy is actually made in most settings (instead, its main value is in drawing attention to the diverse components of policy activity) some of the authors nonetheless were able to use it effectively as a tool for description and analysis. Furthermore, some found that combining two models aided understanding a complex policy environment and set of policy changes.

Overall, the authors of these six cases studies reported, after having prepared the versions of the case studies reproduced above, that they had found the process to be very useful in helping them to attain their goals of gaining a better understanding about bridging the research-policy divide, and developing strategies for doing so upon their return to their own nations and institutions. (It is important to recall that preparing the case studies was just one of the components of the course. It interrelated closely with the other components.)

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<sup>3</sup> Howlett, M, Ramesh, M & Perl, A 2009, *Studying public policy: policy cycles and policy subsystems*, 3rd edn, Oxford University Press, Toronto.

<sup>4</sup> Althaus, C, Bridgman, P & Davis, G 2007, *The Australian policy handbook*, 4th edn, Allen & Unwin, Crows Nest, N.S.W.

They reported that this approach to learning was beneficial as it built upon their existing knowledge. Importantly, the 'learning through doing' approach to adult learning worked effectively in this case.

Some of the most important things learned by the authors of the case studies and the course faculty about using case studies to develop understanding and skills about bridging the research-policy divide are as follows:

- The activity is highly resource intensive. A high faculty:learner ratio is required, along with significant management and administrative support.
- Writing the case studies in English, where this is not the authors' first language, is a challenge. It places extra burdens on the authors and consumes a considerable amount of time. Nonetheless, considering the value for the learners of sharing their products with their peers and course faculty, and receiving advice on how to improve them, writing the case studies in a common language was beneficial.
- Careful consideration needs to be given to the relative amount of time allocated to writing the case studies and reviewing drafts produced by the authors' peers. Spending significant amounts of time on this can be counter-productive.

Although little has been written about how to facilitate learning about concepts and tools that support bridging the research-policy divide in population health, the environment and community development/social action, it has become clear to the authors of the case studies and to the course faculty that writing case studies can be a positive teaching-learning activity. The structured approach to documenting the case studies (using the Integration and Implementation Sciences framework) has assisted the authors to understand and apply new concepts of the nature of the public policy process. It has also assisted them to understand how research findings, along with the systematic, targeted efforts of researchers, can contribute to policy development. The case study method—writing case studies based upon their own experiences—facilitated the Fellows' reflective learning from previous, largely unstructured, experiences of researchers attempting to contribute to evidence-informed policy. It helped users of the method to develop skills in policy systems analysis and identifying the instruments available for influencing policy that are most likely to be effective in a given situation. This and the other components of the course helped create among participants a positive attitude towards adopting active roles at the research-policy interface, based on a higher level of understanding and skills, and the recognition that they can make a difference in this area.