



PUBLIC SERVICE THROUGH PRIVATE BUSINESS: THE EXPERIENCE OF HEALTHCARE WASTE MANAGEMENT IN BANGLADESH

Paper 15

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Abstract

The prevalence of diseases that may be transmitted by hospital waste is alarming in Bangladesh. There is evidence of hepatitis B infection at some point in their lives among 10% of children (5-10 years old) and 30% of adults. About 5% of the total population is thought to suffer from chronic hepatitis B infection. Although cases of HIV/AIDS are few in Bangladesh (only about 13,000 cases estimated in 2001), nevertheless the numbers are rising. In the absence of healthcare waste management, infected syringes and needles are often improperly disposed of. These are collected and resold. Reuse of infected syringes is a potential risk in spreading many diseases including HIV/AIDS.

Hospital waste in Bangladesh is generally disposed of in the same way as ordinary domestic waste. Khulna city, however, is an exception. It remains the only city in the country with a hospital waste management programme (HWMP) running for several years under a public-private partnership arrangement. The need for such services is acute in other cities, including Dhaka city. This paper discusses the potential of delivering healthcare waste management services through private enterprise in partnership with municipalities.

1. Introduction

Heaps of putrefying garbage lying by the roadside or bulging out of dustbins are a common sight in Bangladesh. Pedestrians avoid the foul-smelling mass by walking as far away from it as possible. But if one has the nerve to take a closer look, one will discover a more frightening fact. Lurking in the heap are bloody syringes, soiled bandages, used needles – all kinds of items from hospitals. This is not ordinary domestic waste. It is highly infectious and hazardous. It may carry the germs of dreaded diseases like hepatitis (jaundice), and HIV/AIDS. Mixed with the ordinary waste, wastes from healthcare activities make the entire pile a great public health hazard. To make matters worse, poor scavengers (*tokais*) rummage through the pile, earnestly searching for saleable items like syringes. These are collected, washed, repacked and resold to the public. Thus the vicious cycle of transmission continues.

The prevalence of diseases that may be transmitted by hospital waste is alarming in Bangladesh. There is evidence of hepatitis B infection at some point in their lives among 10% of children (5-10 years old) and 30% of adults. About 5% of the total population in Bangladesh is thought to suffer from chronic hepatitis B infection [Ref. 1]. Although cases of HIV/AIDS are few in Bangladesh (only about 13,000 cases estimated in 2001) in comparison to neighbouring countries, nevertheless the numbers are rising [Ref. 2]. Reuse of infected syringes is a potential risk in spreading this disease.

Hospital waste accounts for a very small fraction of the total waste generated in a city. It is estimated

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that in Bangladesh only about 1% of the total solid waste originates from hospitals. Moreover, only 10%-25% of the hospital wastes are infectious or hazardous [Ref. 3]. Therefore, the amount of such waste is quite small. But when this tiny amount is not handled properly, it gets mixed with the domestic solid waste, and the whole waste stream becomes potentially hazardous.

Unfortunately, there is little effort in properly disposing hospital (biomedical) waste in Bangladesh. Hospital waste is generally disposed of in the same way as ordinary domestic waste. The city of Khulna, however, is an exception to this practice. Khulna stands apart as the only city in the country with a hospital waste management programme (HWMP) running for over three years.



Photo: Masum Patwar/PRISM

Infectious wastes are collected and resold

2. Genesis of the program

The Water and Sanitation Program (WSP) of the World Bank, with financial assistance from the Swiss Agency for Development and Cooperation (SDC), launched a community-based solid waste management project in Khulna. This project started in March 1997. The project was locally implemented by Prodiplan, a national NGO. The project initiated a solid waste management system integrating communities, NGOs and Khulna City Corporation (KCC). Under this project, a house-to-house garbage collection system run by communities and NGOs is in place; KCC transports the waste from transfer points.

While doing the above work, the project workers noticed the presence of hospital waste on the streets and in street containers. WSP and Prodiplan took the matter seriously and discussed it with KCC. The City Corporation was very forthcoming and committed moral and administrative support to the idea of a hospital waste management programme. Project personnel then started a dialogue with the Bangladesh Medical Association (BMA), the clinic owners' association and some progressive doctors of Khulna. A number of workshops, seminars and roundtable discussions were held to build consensus. Finally all concerned parties agreed to participate in the programme. However, some disagreement remained regarding payment of a service charge. The Project remained committed to making the system sustainable and resisted the notion of free service. They sought intervention of the City Mayor to overcome the impasse. Mayor Sheikh Tayebur Rahman took a dynamic step and called all concerned parties to a meeting. He explained the necessity of the programme to protect public health and urged them to participate. With his leadership an alliance was quickly achieved and all disagreements about service charge were resolved. The participating hospitals and clinics agreed to pay a service charge according to the volume of waste they generated. Thus the hospital waste management programme was launched in Khulna in 2000 with participation of 20 private hospitals and pathological laboratories. Government hospitals were not included at this stage because subscribing to such service required official formalities, and since the capacity of the programme was not yet adequate to serve such large facilities.

3. Components of the Khulna Hospital Waste Management Programme

WSP, as the technical advisor to the Project, assisted Prodiapan in conceptualising and preparing the various components of the Khulna Hospital Waste Management Programme. The components of the programme are described here.

3.1 Training

The first step was to train doctors, nurses, ayas (female aides) and cleaners about segregating and safely storing various kinds of waste in the following four ways.

3.2 Segregation and storage

- *Needles and sharps*: Contaminated sharp objects such as needles pose a particular threat to public health because they may cause injury and infection. In addition, syringes with needles are much sought after by scavengers due to their resale value. Such syringes may be resold and reused. To prevent re-use, the needle must be destroyed. This is easily accomplished by a cutter that detaches the needle from the syringe. The cut off needles and other sharp items are collected in a plastic bottle held within a stand for safe storage. Service staff from the Programme collect the container when it is filled up. This plastic bottles containing the needles are taken to the final disposal site and deposited into a concrete pit with a lockable lid. A fresh plastic bottle is used for storage of needles at the hospital.
- *Syringe, saline bag and other plastics*: These are kept in a covered plastic bin and collected by service staff.
- *Gauze, bandages, human organs, paper materials and others*: These are kept in a covered plastic bin and collected by service staff.
- *Kitchen waste*: This waste is non-hazardous. It is kept outside in a plastic covered bin. In case of large clinics, it is collected by the community service along with the other domestic waste. For small clinics, it is collected by the hospital waste management service staff.

3.3 Collection and transport

Collection staff of the Programme collect the waste everyday from each participating clinic. They then load it into a specially designed vehicle. The vehicle is driven to the final disposal site located seven km from the city.

At first an autorickshaw (motorized tricycle) van was procured and modified to safely carry the waste. This vehicle ran out of capacity as more hospitals joined the program. In 2002 a 1.5 ton capacity truck was procured with assistance from UNDP's Sustainable Environmental Management Programme (SEMP).



Covered van safely transports hospital waste

3.4 Final disposal and treatment

KCC has leased to the Programme a piece of land measuring about 2,000 sq ft (185 sq. m) in the city's dumpsite area for the final disposal of hospital waste. This area has been fenced to allow access by authorized personnel only. The hospital waste vehicle brings the waste to this area. Final disposal takes place in the following manner.

- All sharps (e.g. needles, blades) and plastics are placed in a concrete pit with a lockable lid. The lid is kept locked to prevent access by scavengers.
- All bandages, gauze, cotton, body parts, and paper are burned in a locally-made incinerator. It can burn about 30 kg waste at a time.



Shredder for syringes



Incinerator for burning waste

- The resulting ash is disposed of in the municipal dumpsite. Sometimes there is difficulty in achieving complete combustion, especially if the material to be burned is not fully dry. If needed, kerosene is added as fuel to assist the burning process. There were some problems initially due to smoke. Subsequently the chimney height was raised to 15 feet.
- Plastic items such as syringes and intravenous bags are disinfected by immersing in chlorine solution. Then they are destroyed by a shredder machine to prevent reuse.
- There is a shallow concrete lined pit with a tin shed for temporary storage of non-plastic infectious items such as bandages, cotton, etc. Bleaching powder is sprinkled here to disinfect the items. These items are later burned in the incinerator. The shredder machine is housed here also.
- Project staff wear protective clothing such as rubber boots, gloves, and heavy uniform whenever handling hospital waste.
- Non-hazardous kitchen waste is disposed of in the municipal dumpsite.

4. Present status

HWMP witnessed steady growth in demand for service. However, the SDC assisted project ended in December 2001. This was a setback as the HWSP was still not financially self-sustaining. Fortunately, PRISM Bangladesh came forward to continue the project from 2002 under a community-based urban wastewater treatment project. This is a project implemented by the Ministry of Environment and Forests with assistance from UNDP. The aim now is to cover all healthcare facilities within Khulna. Already the number of participating facilities has increased from the initial 20 to the present 42, including the Khulna Sadar Hospital. Each of these institutions is paying a monthly service charge between Tk. 100 and Tk. 600 (US\$ 1.5 to 9) depending on the volume of waste generated. From the initial reluctance, healthcare facilities are now showing interest to join the Programme. One key reason

is the reliability of the service. The Programme has been delivering quality service for nearly five years. Secondly, awareness among healthcare institutions has been raised through meetings and dialogues. There have also been public awareness campaigns. This has further put pressure on the healthcare institutions to demonstrate their social responsibility in managing their waste properly. Thirdly, the Khulna City Corporation has issued letters to the city's healthcare facilities to encourage them to join the new programme and reduce public health hazards.

At present there is no external support for the Hospital Waste Management Programme. The service charges that are being collected are sufficient to cover the running costs. The Programme, therefore, has reached a sustainable point. However, attaining only the break-even condition leaves the Programme vulnerable to any sudden need for funds. For example, a vehicle breakdown may require a large sum for repair. The Programme is continuing to discuss this issue with the stakeholders. In future it may be possible to increase service charges by around 25%, and receive a fuel grant from the City Corporation. This will put the Programme on a firmer footing.

5. The Situation in Dhaka and the Need for Replication

The Khulna City initiative has demonstrated that it is feasible to provide service through public-private partnership. It is possible to replicate this example in other cities of Bangladesh. In fact, there is a great need for such a service. For example, Dhaka City, with a population of over 10 million, does not have any hospital waste management service. Recently a survey was conducted in a selected ward of Dhaka city to assess the present practice of healthcare waste management [Ref. 5].

This survey was carried out in 61 healthcare establishments including hospitals, clinic and diagnostic laboratories. It was found that all these facilities generate hazardous waste like used syringes, contaminated cotton, broken vials, etc. All combined, they were generating about 6.4 tons of waste daily. Of this amount, about 20% (1.2 ton/day) was found to be hazardous. Dhaka Medical College Hospital alone produces 733 kg/day of hazardous waste, which is nearly 60% of the total hazardous waste generated by all the facilities combined.

Only about 20% of the facilities have systematic in-house collection of wastes. The rest do not segregate hazardous waste. Only a few private hospitals send their hazardous waste to an incinerator. The rest simply dump the waste into municipal bins.

The survey also found an acute need for awareness building among the healthcare professionals. About 70% of the institutions surveyed never had any training on healthcare waste management. As no regulation were being enforced, there was no standard practice or quality control. Nearly all hospitals reported that they did not have any budgetary provision for training of staff or maintaining an in-house waste management system.

5.1 New initiatives in Dhaka and Jessore

Attempts are being made to replicate the success of the Khulna programme in Dhaka and Jessore. In Dhaka, WSP and WHO in partnership with PRISM Bangladesh opened a discussion with the Dhaka City Corporation (DCC) and Private Clinic Owners' Association. DCC showed a keen interest in supporting the initiative. They donated a piece of land (about one acre [0.4 Ha]) for final disposal of healthcare waste. Later the Canadian International Development Agency (CIDA) provided a seed fund to PRISM for constructing a facility on the land and beginning to provide a service with a few healthcare facilities. This pilot service is now operating.

In Jessore, another initiative has been launched by PRISM Bangladesh with assistance from the Ministry of Environment and UNDP. Jessore Municipality is providing support to this programme. They have given a land where a final disposal facility has been constructed. A collection vehicle has been procured. Public awareness and training have been provided. A committee has been formed with

representatives from government agencies, hospitals, journalists, and other prominent citizens. The committee is facilitating the programme by interacting with healthcare institutions and raising social pressure. As a result, 33 healthcare facilities have already subscribed to this programme.

6. Some Critical Issues

Sustainability is a key issue in planning and implementing any programme. The Khulna programme started with external funding. As an experimental program, the overriding concern was to see if a public-private model could be implemented. Initially the service charges were kept low to encourage hospitals to join the programme. However, later it was possible to raise the charges, and attract more hospitals to join the programme. Consistent service quality and a sense of ownership by the City Corporation, along with public awareness, contributed to this success. The services charges were set in consultation with the hospitals and the City Corporation. This openness and participatory approach also helped in creating ownership. It was also made clear from the beginning that external funding would stop at some point, and therefore, the programme must seek ways to become self-sufficient. Such clear objectives helped in steering the programme towards sustainability. At present, the programme has reached a break-even point, but it is necessary to build savings to safeguard against sudden cashflow requirements. The Programme is discussing this with the subscribing hospitals. The Programme is also lobbying for a fuel grant from the Khulna City Corporation. If received, this will reduce the operating cost further. The key here is that the citizens, city authorities and hospitals must feel that the Programme should continue in the interests of public health. With this support and with continuing quality service it is possible to achieve sustainability without depending on external funding.

The scaling up and replicating of the pilot, however, requires legislative and policy support. The segregation of waste in Khulna was largely accomplished by motivation with only occasional monitoring by the service provider NGO. But to make an impact at national level, enforcement of rules and strong external monitoring would be required.

There is a need for training and technical advice for prospective private agencies. The Khulna pilot was successful due to the availability of technical advice from the WSP. The Programme also has a competent management team capable of managing staff and finances, and at the same time engaging with citizens, clients and the City Corporation. Therefore, the private sector firm must be carefully selected and a management team with adequate competence should be put in charge. A flexible management style and autonomy are also needed to allow troubleshooting of emerging issues. Overall, the service should be seen as a management service as much as a technical one.

7. Conclusions

There is much room for improvement in the Khulna initiative for managing hospital waste and in the replication of the example in other cities of Bangladesh. But as a pioneer project, we believe it has set a good example. Firstly, it has demonstrated the importance of a participatory and consensus building process. Raising awareness, dialogue and securing political will have been the key processes of convergence towards a service arrangement. This aspect is very important as we do not yet have adequate policy and legal frameworks to ensure proper management of hospital waste. It may be mentioned here that the World Bank has recently produced a report that raises the same concern [Ref. 5]. Secondly, it has shown that, if a good service is delivered, there is no dearth of demand. The participating institutions have been paying the service charge regularly, and more healthcare institutions are joining the Programme. Thirdly, the Programme is a great illustration of a public-private partnership – KCC, the public authority, providing the necessary land, administrative and political support, an NGO providing the service and management. Both sectors are fully exploiting their comparative advantages.

Yet many challenges remain to be met. There is a need for introducing improved technology such as autoclaving for sterilizing infected plastic items, which may then be safely shredded and disposed. This will greatly reduce the risk of infection. The Programme is running on a voluntary participation basis. There is no legal requirement on the hospitals to subscribe to the Programme for safe disposal of their waste. Formulation and enforcement of proper policy are required to bring all healthcare facilities under the Programme. The Programme is partly dependent on project funding. Secured funding is necessary for the sustainability of the programme. The possibilities of increasing service charges and obtaining a matching grant from KCC or other sources should be explored.

A recent study by the World Bank estimates that about 36,000 tons of healthcare waste is generated every year in Bangladesh. Out of this amount approximately 7,200 tons may be considered hazardous [Ref. 5]. Needless to say, these wastes must be managed properly to protect public health. The study report has made specific recommendations in this regard. Stakeholders now need to review these and select the most appropriate line of action. The survey conducted in Dhaka shows that there is a serious need for providing healthcare waste management services. There is also need for building awareness among healthcare professionals. We conclude with the hope that, following the initiative in Khulna, similar programmes for managing hospital waste will soon be undertaken in other cities of Bangladesh. This will require extensive work on creating a policy and regulatory environment that encourages public-private partnership for healthcare waste management.

Bangladesh does not yet have legislation on healthcare waste management. A draft rule has been prepared, but it has not been adopted yet. There has been another government initiative to standardize colour coding of hospital wastes for in-house management. There will be further strengthening of hospital waste management in Bangladesh when the rule is enforced and a monitoring programme is in place.

Disclaimer:

The opinions expressed in this article are the authors' own, and do not reflect those of the Water and Sanitation Program, Jahangir Nagar University or PRISM Bangladesh.

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