Medical Waste

The last mile: reaching rural India

T he pilot project for improving rural medical waste management was only launched in India last year. For the first instance, the new law希望通过 this initiative to focus on, but few facilities in rural areas will come alive in its present form. It may be said that when there is still to bother to do it in cities, why open up a new front? However, there are many pushers for understanding the dynamics of rural medical waste delivery systems, including the new innovative chains using disposables systems and the empirical means in that sector for solutions.

There is already experiment in the field that can help in deficit-solving solutions for rural areas, even through the operational dynamics on very different – both in terms of infrastructure and the political and operational dynamics of rural areas needs to be considered. There is a need to study the operations here in greater depth, and for investing new solutions which can work effectively, and cut into rural operations. The classic mode of installing small facilities at the collection points have only led to operational dynamics which often lead, have mixed results, and often do not work.

In India, rural is defined in at least 2 ways. More specifically, it is any area with a population of less than 2,000 persons or a density of less than 400 persons per square kilometer, with more than 10 percent of the land used for agriculture. Rural India is home to about 72 percent of the country’s population by the year 2011.

The rural health care system in India

The delivery of health care in rural India through a multi-levelled system, ranging from grassroots levels and primary health care facilities to tertiary care institutions.
Infectious waste

Generally, infectious waste in rural areas is disposed of through open burning or dumping. However, these practices should be totally discouraged as they pose a threat to the environment and the community.

Small clinics or rural areas that generate small quantities of waste may use certain basins for proper containment before final disposal. In the likes of Medical Waste (Management and Handling) Rules, 1998, there is no specific prohibition for the disposal of waste in rural areas.

A pit or trench should be dug at least five metres deep to be filled with waste, then be covered within 30 days of its being filled, ensuring that the pit walls are smooth. In case of rain, when water is added to the pit, it takes at least 15 days to be added in order to cover the pit. The deep burial method can be used by small settlements where the shallow pit method will not suffice.

While open burning is not considered safe, it can be used to dispose of infectious waste through proper means. In some rural areas, open burning is practiced due to the lack of proper treatment facilities.


table 1. Existing practices in rural areas

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<tr>
<th>Waste generated</th>
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While infectious waste is generated in rural areas, the waste is collected in a single-use bag to prevent leakage and contamination. Once collected, the waste is transported to a centralised facility for proper treatment and disposal.

Infectious plastic waste

An infectious plastic waste is a result of the use of disposable syringes, which are meant to be discarded after use. These syringes are made of sterile plastic material.

The major challenge associated with the use of disposable syringes is the volume of waste generated. This waste is usually not treated properly, leading to health hazards and environmental pollution.

Infectious plastic waste

Solutions

Rural areas need to learn from the mistakes of urban India. Low-cost waste disposal technologies combined with good practices such as waste segregation and minimization after a solution to their impediment to waste problem

Waste generated

From the few studies carried out by GoI as well as from the reports of various environmental bodies, it has been found that a rural health care setting of around 20 beds generates approximately 2 kg of infectious waste in a day. The level of waste that is generated includes the following:

- Infectious waste: Plastics, medical equipment, etc.
- Infectious liquid waste: Medicines, blood, syringes, etc.
- Infectious solid waste:锐利废物,医疗废物,和护理废物.
- Infectious gas: Medical gases, etc.

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Toxics
Black waste is being time of generation. No protective gear is reusable glass Scavenging of waste by

Effective systems for safe handling, treatment and These programmes in particular need to incorporate

New widespread immunisation programmes are

Waste generated from immunisation: All healthcare establishments to:

Handling) Rules, 1998, make it mandatory for rural areas need to learn from the mistakes of urban India. Low-cost waste disposal technologies combined with good practices such as waste segregation and minimisation after a solution to their impending waste problem

Legislation for rural areas

Use of obsolete technologies

Figure 2. Autoclave

Release

Steam

Insulation

Door

Inlet

Valve

Solutions

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Table 2. Estimated average availability of used syringes per centre by periodicity

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<td>No of syringes/facility for full immunisation</td>
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Table 1. Existing practices in rural areas

| Waste Segregation | Waste is generally mixed in a single box |
| Waste Collection & Storage | Open and close boxes do not exist in rural areas. Syringes are kept in boxes with glassware. Syringes are also kept in boxes with cotton wool. Essential items are often not indicated. In some districts waste is being segregated into different categories. |
| Waste Transportation | Waste is transported internally from the point of generation to the health care centre (or health care worker). Workmen are not identified and there are no cases of spillage or contamination. |
| Waste Treatment | No specific waste treatment procedures followed. |  |
| Waste Disposal | Open dumping of waste around the health care centre. |

Accumulation of waste in medical and dental units is very serious. The high temperature and moisture are ideal for bacterial growth. The contaminated waste material contains hazardous substances such as blood, body fluids, organs, etc. and is identified as infectious waste. In such cases, the procedure for disposal should be followed. |

Infectious waste

Generally, infectious waste in rural areas is disposed of through open burning or depositing. However, these practices should be totally discouraged as they pose a threat to the environment and the community.

Small clinics or rural areas that generate small quantities of waste may choose to send basic generic waste as per minimum standards laid down in the Biomedical Waste (Management & Handling) Rules, 1998, as areas with population less than 50,000 persons.

A pit or trench should be dug for waste to be buried with some earth or soil within 30 cm of the surface before filling the pit with the rest of the pit walls soil. On each occasion, when waste is added to the pit, 5 cm of soil should be added to cover the waste. The deep burial site should be preferably impervious and a shallow well should not be close to the site.

Infectious plastic waste

Autoclaves are standard equipment in all health care centres, especially in government centres. An example of the State of Andhra Pradesh, the availability of used syringes for achievement of universal immunisation through the public health system is summarised in Table 1.

Figure 2. Autoclave

The major challenges associated with the use of disposable syringes are the volume of waste that will be generated and its management. The volume of waste disposable syringes estimated with estimates of 70 million AD syringes being procured by 2005 for global immunisation programs alone (as estimated by WHO).

With around 85 per cent of the immunisation being provided in small boxes (as estimated by WHO) and the growing use of disposable syringes, the quantity of waste generated is now rising at an alarming rate. A growing concern over more of syringes due to their lucrative value has magnified the problem.

Estimated availability of used syringes

As per schedule, each infant needs to be given a total of eight injections for DPT, BCG, Hep-B and measles at specified intervals during the first five years, for full immunisation. Taking the example of the State of Andhra Pradesh, the availability of used syringes for achievement of universal immunisation through the public health system is summarised in Table 2.

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The figures represent the estimated availability during the year 2000-2001, subject to the introduction of AD syringes for the immunisation program effect from April 1, 2002. There will be a marginal increase in the availability during the next five-year period, in line with population growth. Assuming an average growth in population of around 1.4 per cent per annum, the availability would require an increase of about 10 per cent per annum after five years.

Use of obsolete technologies

With the new worldwide trend of opting for AD syringes, it seems that the days of the glass syringes, which are still preferred, are numbered. In India, alone, current trends that 6.3 million injectors are abandonment annually, even though rates of these are unverified scientifically. Some 4.2 billion AD syringes could result in

Waste generated from immunisation practices

Disposal of waste generated from immunisation practices is simple enough to be manufactured in rural areas. However, the major difference is in choosing an appropriate technology. Rural areas need to have access to low-cost options for treatment. It should, however, be kept in mind that a complete solution to the problem of medical waste lies with the implementation of effective systems for safe handling, treatment and disposal of waste streams.

General waste: Waste generated from immunisation practices: Waste generated from immunisation practices: Infectious plastic waste

Segregate waste at source. All health care establishments to:

The treatment options for disposal of the waste streams.

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Legislation for rural areas

The Bio-Medical Waste (Management & Handling) Rules, 1998, make it mandatory for all health care establishments to:
- Dispose of all infectious waste
- Segregate waste at source
- Have autoclaves or equivalent equipment to sterilise medical waste
- Keep infectious waste in secure containers
- Ensure proper disposal of infectious waste
- Implement waste minimisation practices
- Encourage waste segregation at source
- Provide training to staff on waste management

New programmes in particular need to incorporate
generating millions of single-use syringes globally.

Infectious waste

The treatment options for disposal of the
waste generated in rural areas is not very
commonly practiced due to the lack of
appropriate infrastructure to handle it properly. The unavailability of proper solutions to the problem of medical waste lies in the rural health care setting.

Solutions

Rural areas need to learn from the mistakes of urban India. Low-cost waste disposal technologies combined with good practices such as waste segregation and minimization after a solution to their impending waste problem.

**Infectious waste**

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- Small-clients or rural areas that generate small quantities of waste may use one-time-use basic pits or as per manual latrines laid down in the Bio-Medical Waste (Management & Handling) Rules, 1998, as areas with population less than
- 50,000 persons

A pit or trench should be dug two meters deep. It should be filled with lime, then covered with lime within 50 cm of the pit walls. On each occasion, when waste is added to the pit, a layer of lime should be added to cover the surface. The sheep burial method should be relatively improvised and should not remain to close to the site.

**Defensive waste**

The volume of defensive waste, which is mainly composed of glass sharps including broken glasses, needles, and bandages, body fluids.

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- Generating millions of single-use syringes globally.

Infectious plastic waste:

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Multi-layered system of rural health care
- District hospital
- Sub-district hospital
- Primary Health Centre
- Sub-centre

Toxics Link Factsheet

December 2002

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Budgetary allocation for health has been below desirable levels. In fact, over-use of injections by rural medical practitioners is an issue which comes as a result of the demand side—whereby the scarcity of medical staff and personnel in the country, this shortfall is expressed needs in rural areas needs to be understood better and reflected in the composition of rural PHCs.

There is also a very laudable initiative in the field that can help in finding solutions for rural areas, even though the operational dynamics are very different—both in terms of infrastructure and capacity. The initiative is called suckling baby syndrome. This initiative aims at identifying small hospitals which may be seen as a challenge, particularly in rural areas, where pre-natal and post-natal care is needed. It is also necessary that all PHCs are equipped with small-scale facilities for treating simple tests. We should ensure that every PHC, CHC, and Sub-Referral Centre of the country is properly equipped and manned.

However, there is a general shortage of medical personnel in the country, this shortfall is expressed needs in rural areas, even though the operational dynamics are very different—both in terms of infrastructure and capacity. The initiative is called suckling baby syndrome. This initiative aims at identifying small hospitals which may be seen as a challenge, particularly in rural areas, where pre-natal and post-natal care is needed. It is also necessary that all PHCs are equipped with small-scale facilities for treating simple tests. We should ensure that every PHC, CHC, and Sub-Referral Centre of the country is properly equipped and manned.

Vaccines
Vaccination is one of the most cost-effective preventive health care interventions. It is also necessary that all PHCs are equipped with small-scale facilities for treating simple tests. We should ensure that every PHC, CHC, and Sub-Referral Centre of the country is properly equipped and manned.

In addition to the general shortage of medical personnel in the country, this shortfall is also expressed needs in rural areas, even though the operational dynamics are very different—both in terms of infrastructure and capacity. The initiative is called suckling baby syndrome. This initiative aims at identifying small hospitals which may be seen as a challenge, particularly in rural areas, where pre-natal and post-natal care is needed. It is also necessary that all PHCs are equipped with small-scale facilities for treating simple tests. We should ensure that every PHC, CHC, and Sub-Referral Centre of the country is properly equipped and manned.

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Table 3. Cost comparisons

<table>
<thead>
<tr>
<th>Type of facility</th>
<th>Cost (Rs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>针的摧毁者</td>
<td>200-500</td>
</tr>
<tr>
<td>针的切割器</td>
<td>1,500-4,000</td>
</tr>
<tr>
<td>针的破坏器</td>
<td>200-500</td>
</tr>
<tr>
<td>针的处理情况</td>
<td>50,000-1,000,000</td>
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<td>针的处理情况</td>
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<tr>
<td>针的处理情况</td>
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The public health intervention in the country has been below desirable levels. The central government’s allocation for health, as a percentage of the total Central Budget has been stagnant at 1.5 per cent, while in the states it has declined from 10 per cent to 5 per cent. The current trend per capita public health expenditure in the country is no more than Rs 20. This trend continues, it is to conclude that such the machinery and quality of public health services have been below desirable standards.

For example, medical facilities, funding is generally insufficient, the equipment in many PHCs and CHCs does not function properly. In the rural areas, the equipment in many PHCs and CHCs is in a dysfunctional state. As a result of this, facilities in rural areas will come under its purview. It may be said that when there is still ready to be done in the cities, why open up a new front? However, there are many pushers for understanding the dynamics of rural health care delivery urgently, including the new initiatives being undertaken by government for the disposal of waste that operational deficiencies can come to.

Among the growing number of citizens and safer solutions are a combination of deep burial, small-scale incinerators and simple devices such as needle-cutters, etc.