How hospitals in Nepal are making waste their business

Since the COVID pandemic, major hospitals across Nepal have set up environmentally friendly systems to segregate, treat and dispose of healthcare waste. The results? Cleaner premises, safer working conditions, no more burning of waste and welcome revenue from the sale of recyclables.

It's been two years since Shanti Budal has seen a cow or a dog rummaging through waste on the grounds of Seti Provincial Hospital, a 300-bed facility in western Nepal. But when she took up her post as nursing administrator at the hospital a few years ago, it was a common sight. Animals had easy access to the storage area where waste of all kinds piled up in overflowing buckets, sometimes for weeks, until it was taken to the landfill. 'Back then there was no waste segregation,' she recalls. 'Everything was mixed up. Nothing was recycled.'

'I'm really proud of how much cleaner our hospital has become,' Shanti Budal continues, reflecting on the changes she has helped to introduce as part of a government-led initiative to improve the segregation, transport, treatment and disposal of healthcare waste at major hospitals across Nepal. 'Waste is well managed now. Every ward is clean and we don't dump anything anymore.' She is especially satisfied that staff from private health facilities now visit Seti Hospital to see what good waste management looks like. Camera crews from local and national television stations have come, too. 'The system we have created is changing the perception that government hospitals are not well managed,' she says.

COVID-19 catalyses progress on a neglected issue

Healthcare waste management challenges are alarmingly widespread. According to the World Health Organization and UNICEF's 2023 Global Report on water, sanitation, hygiene, waste and electricity services in health care facilities, only 61 per cent of hospitals

worldwide – and 44 per cent in the world's least developed countries – have in place basic healthcare waste services (defined as separating waste into at least three bins and safely treating and disposing of sharps and infectious waste). In Nepal, prior to the COVID-19 pandemic, only 1 per cent of hospitals met this standard.

Since 2018, when the UN Secretary General issued a Global Call for Action to improve access to water, sanitation and hygiene (WASH) and waste management services in health facilities worldwide, the Government of Nepal has taken significant steps to address this neglected issue. A key milestone was the national workshop on healthcare waste management and WASH – convened in December 2019 by the Ministry of Health and Population with support from German development cooperation and other partners – which drew attention to the challenge and concluded with the adoption of a 12-point action plan for the coming years.

Only months later, COVID-19 began to sweep the globe, radically increasing the volume of infectious waste which needed to be safely managed in hospitals across Nepal. 'How to deal with waste was one of our major challenges,' says Dr Jagadish Joshi, the Provincial Health Director in Sudurpachim Province, home to Seti Hospital. 'There were no guidelines, people were afraid of touching waste, and we didn't have the right technologies to manage it safely.'

The pandemic, for all its devastating impacts, accelerated progress on healthcare waste management in the country. Since 2020, the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), working on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ), has supported the Ministry of Health and Population to introduce sustainable healthcare waste management systems in 13 of Nepal's largest hospitals, in line with national standards for healthcare waste management. These efforts have drawn upon and benefitted from the experience of local and international organisations, development partners and government authorities who are at the forefront of Nepal's growing healthcare waste management movement.

[**Insert map**]

'We used emergency funds for COVID response to develop systems which the hospitals will be able to use for a long time to come,' says Alexandra Plueschke, the head of the GIZ-implemented Support to the Health Sector Strategy project. 'Hospitals have started to make waste their business, both by taking it on as a core responsibility and by unlocking its financial potential.'

This article describes what has been done in course of this collaboration and takes a look at the challenges which still lie ahead for healthcare waste management in Nepal.

Getting comprehensive healthcare waste management systems up and running

Good healthcare waste management requires many elements to come together: The right equipment and technologies for segregating, transporting and treating waste safely. Sufficient, properly trained human resources who understand why each of these steps is important and perform them diligently. Regular monitoring to make sure that procedures are being followed and to track what difference they are making.

A comprehensive assessment carried out at the start of the project showed that the elements needed for such systems were largely missing. Only two of the 13 hospitals had properly trained focal persons responsible for waste. On average, 94 per cent of the waste being generated was infectious – a clear indicator of the failure to segregate infectious and non-infectious waste at source. Yet if the hospitals *had* segregated and treated their waste correctly, more than half of it, on average, could have been sold locally.

[Infographic - baseline situation]

The Support to the Health Sector Strategy project worked with four implementing partners – Waste Service Pvt. Ltd. in western Nepal; HECAF 360 and Health Care Without Harm in the Kathmandu Valley; and Green Path Nepal & Eco Concern Pvt. Ltd. (JV) in eastern Nepal – to implement a package of measures to put the hospitals' waste management systems on a new footing. The interventions unfolded in four stages:

Planning, setting up and equipping waste treatment centers

The first task was infrastructural: each hospital needed to have its own dedicated space for waste treatment and storage, with industrial-sized autoclaves for sterilising infectious waste, clearly marked routes for transporting risk and non-risk waste, adequate ventilation, doors which lock securely, and large cages for storing treated, segregated waste awaiting sale or disposal. The project team began with detailed waste audits to determine the overall volume and type of waste being generated at each hospital, as well as engineering assessments which considered the physical layout, available space and electricity supply. Renovations, procurement and the installation of equipment followed – as did the purchase of hundreds of color-coded buckets, labels, stickers, informational signs, trolleys, needle cutters and sharps containers which formed the backbone of the new waste segregation system in every ward of every hospital.

Training: Making waste management everyone's job

Together with WHO Nepal and UNICEF, the project supported the National Health Training Centre (NHTC), the in-service training institution of the Ministry of Health and Population, to develop a learning resource package on healthcare waste management. Through a cascade approach, more than 2,400 people – from officials at provincial health training centers to hospital administrators, doctors, nurses and waste workers – were trained in standard healthcare waste management practices, infection prevention and control, WASH in healthcare facilities, and environmental health. In addition, the hospitals hired and trained autoclave operators to work with the newly procured and installed technology.

Implementing the systems, starting with model wards

The new procedures were introduced in a single 'model ward' in each hospital before being scaled up further. Field coordinators at each of the 13 hospitals supervised the new practices on the wards, ensured that validation tests were being run correctly on autoclaves, and facilitated contracts with vendors who would buy the paper, cardboard, plastic, metal and certain categories of treated waste, such as rubber tubing and gloves, from the hospitals. They also introduced a set of 'waste tracker' tools, developed by Health Care Without Harm, which allow hospitals staff to monitor and visualise the performance of different aspects of the waste management system.

Mentoring and guiding the work of healthcare waste management committees

The field coordinators also acted as mentors for newly designated healthcare waste focal persons and members of the healthcare waste management committees. 'The new national standards and guidelines make clear that governance arrangements are as important as technical considerations when it comes to healthcare waste management,' explains Tirtha Kumar Sinha, a deputy programme manager who leads GIZ's work in this area. 'Functioning healthcare waste management committees are essential for the sustainability of the model.' Among others, the committees are responsible for ensuring that new staff are inducted into the system, that technical problems are promptly resolved, and that the occupational health and safety of waste workers is prioritised.

'Like a miracle': Systematic waste management shows what it can do

By the end of the project in December 2023, new systems were up and running in all 13 hospitals – either in selected wards (as in the four hospitals in the Kathmandu Valley) or institution-wide (as in the other nine). The results were hard to ignore.

'It is like a miracle that, in just two years, it has been possible to put in place changes which eluded us for 10 or 15 years,' says Dr Jagadish Joshi, the Provincial Health Director in Sudurpachim Province.

Before, piles of dumped waste, wandering animals and flows of leachate were visible for all to see…. Now there are separate routes for infectious and general waste, proper segregation, use of autoclave machines for sterilisation of waste,

and regular recycling. Seti and Mahakali hospitals are now serving as the learning centers for all other hospitals in the province. This makes us proud.

Dr Jagadish Joshi, Provincial Health Director, Sudurpachim Province

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A comparison of data collected via waste audits before and after the interventions back up these impressions. In Seti Hospital, for example, only 39 per cent of the overall waste is now infectious, compared to 99 per cent before the interventions. Similar results have been measured in the other hospitals.

[Chart/infographic showing endline situation]

Less infectious waste overall – and better handling and treatment of the risk waste which is generated – is important for occupational health and safety. Waste workers in the hospitals have been vaccinated against Hepatitis B and have consistent access to protective equipment such as aprons, masks and gloves. In some provinces, hospitals are subsidising health insurance premiums for waste workers and their families. This is important, says Gyanu Kunwar, who coordinates the healthcare waste system at Seti Provincial Hospital: 'Waste management is a hard and risky job. Hazard pay, incentives and access to health services can help to minimise staff turnover.'

Finally, hospitals have joined the circular economy and have begun making money out of waste. 'Since we have taken on waste management as an integral part of our services, every staff member is aware of it and knows that we generate revenue by selling our waste,' says Dr Sher Bahadur Kamar, the Medical Superintendent at Seti Provincial Hospital. Some of this income is redistributed in the form of incentives to waste workers, while the rest goes into the general hospital budget, he adds.

We used to spend about 80,000 NPR [555 EUR] every month to have a company haul away our untreated waste. Now, thanks to our good segregation and sterilisation practices, we don't pay anything and we earn as much as 50,000 NPR [347 EUR] per month through the sale of recyclable waste. We are making money and minimising the risk of infections at the same time.

Dr Sher Bahadur Kamar, Medical Superintendent, Seti Provincial Hospital

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What will it take to sustain these systems?

The comprehensive interventions supported by German development cooperation and its partners has demonstrated the feasibility of healthcare waste management systems in large government hospitals in Nepal. 'There has been visible progress in institutionalising the standard practices of sustainable waste management,' says Dr Sarbesh Sharma, the former Director of the Management Division of the Ministry of Health and Population.

But what will be required for their continued smooth operation – and for this approach to be replicated elsewhere in Nepal?

Monitoring: 'If you can't measure it, you can't manage it'

'Regular monitoring is really important for pushing things forward,' says Ruth Stringer of Health Care Without Harm, who worked closely with HECAF 360 to guide project implementation in four of the hospitals. She notes that, while detailed waste audits can be valuable from time to time, what is most critical is the daily collection and use of data within hospitals: Are the bins clean? Do the needle cutters work? How well is segregation being done on the wards? How much waste is being generated and how much is being autoclaved? This type of information is crucial for steering the system.

At the same time, the government should require that hospitals regularly report on their waste management activities. Without this information, it is impossible to know where investments should be made, where further training is required, and how trends in waste management are evolving. An important step – and one already under discussion at the technical working group at the Environmental Health and Healthcare Waste Management section of the Management Division at the Department of Health Services – would be to integrate one or more waste-related indicators into Nepal's health management information system.

'If data continue to be collected after this project ends, the problem will be visible and will continue to get attention,' says Ruth Stringer, referring to the powerful motivating effect of the WHO and UNICEF Joint Monitoring Program, which collects and analyses data on WASH services, including health care waste management and environmental cleaning, in health care facilities. 'Without the data, it won't get the attention. If you can't measure it, you can't manage it.'

Well-trained and supported personnel are needed to keep systems going

According to national healthcare waste management standards, hospitals should designate healthcare waste focal persons and waste workers from among existing hospital personnel and provide them with appropriate training. Most hospitals have undertaken this step, however the high turnover of personnel and the fact that existing staff have additional responsibilities means that not all hospitals are yet in a position to provide dedicated personnel for the management of healthcare waste. This is a significant obstacle to sustaining and scaling up properly run waste management systems. Some hospitals have taken the initiative to recruit staff locally, using their own resources, to work exclusively on healthcare waste – a welcome

development which highlights the value they place on their new waste management systems. Such examples could be highlighted and promoted more widely.

Operations and maintenance are essential – and must be budgeted for

Finally, waste management infrastructure is only beneficial if it is in good working order. When bins are dirty or cracked, when needle cutters jam, or when autoclaves are out of service due to technical problems, the entire waste management cycle comes under threat. Health facilities in Nepal need to have a dedicated budget for the operation and maintenance of their waste management systems – something they do not currently have – and new investments in waste management infrastructure should be accompanied by commitments or plans for covering recurring costs.

Attitudes have changed and the know-how is there. The hard work must continue.

Healthcare waste management has come a long way in Nepal over the past 15 years. 'When I first came to Nepal in 2009, everything was being burned,' recalls Ruth Stringer of Health Care Without Harm. 'Now there is a commitment to autoclaving everything and to recycling. This is a huge win.'

As part of its Second Nationally Determined Contribution (NDC) in 2020, the Government of Nepal committed that 1,400 healthcare facilities will use no-burn technology. 'Our goal is to help institutions achieve sustainable healthcare waste management and to become environmentally resilient,' explains Dr Sangeeta Mishra, Director General at the Department of Health Services in the Ministry of Health and Population.

There is a growing body of practical implementation experience which can be drawn upon as the journey continues. The tools, methods and resources endorsed by the technical working group of the Environmental Health and Healthcare Waste Management section of the Management Division at the Department of Health Services, and scaled up to major hospitals countrywide with German support over the past three years, are being picked up by provincial governments and other development partners and are being used to replicate the approach in other facilities.

The road ahead is long, and the work must continue – every day, in every healthcare facility. 'Waste is a source of infection, nuisance and risk. It's harmful for everyone, and this makes it our common responsibility to manage it,' says Narmaya BC, who has been a waste collector at Seti Hospital for six years. 'Waste workers alone can't solve this. People need to accept that that waste management is everyone's job.'

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