

BREAKING THE CYCLE: CAN UGANDA

Uganda's health facilities generate tonnes of medical waste daily, yet most of it is never safely disposed of. In the final of a three-part series, **Jackson Sewanyana** explores how government, private providers and researchers are charting a new course in medical waste management and what remains to be done.

Uganda's medical waste crisis is not unconquerable, experts agree. However, unless medical waste is managed with the same urgency as disease itself, that is, through urgent reforms and practical disposal systems, even at household level, the very tools meant to heal will continue to harm both people and the environment.

The call for reform starts with upgrading the existing infrastructure that has long been overstretched. For years, many health facilities have relied on the Nakasongola disposal site under Luwero Industries Ltd, a subsidiary of the National Enterprise Corporation (NEC).

Originally designed for hazardous and nuclear waste, it was never intended to handle the country's entire medical waste burden. Fortunately, there's light on the horizon, with government efforts underway to build a sustainable national system.

Dr Herbert Nabaasa, the commissioner for environmental health at the Ministry of Health, says the Government has begun setting up regional incinerator hubs, with plans for 16 high standard facilities modelled on Nakasongola. Five are already under construction, including one in Ddundu (Mukono) for the Kampala Metropolitan area and others in Lango, Acholi, Toro and Ankole. These are expected to be operational by the end of this year. The other hubs are planned for West Nile, Karamoja, Kigezi,



One of the 16 regional incinerator hubs the Government is constructing in Lira to handle hazardous medical waste from Lango sub-region. (Scan photo using Vision Digital Experience to watch video)



Dr Bruno Oyik



Dr Herbert Nabaasa



Dr Stella Maris Nanyonga

Teso, Bugisu, Bukedi, Busoga, Rwenzori, Sebei, Elgon and Bunyoro sub-regions. Funded by the Global Fund, the

WHAT IS MEDICAL WASTE?

Medical waste is classified into four categories:

- **Highly infectious waste includes blood, placentas, blood stained gloves, and bodily fluids (e.g. urine, stool, saliva, sputum, breast milk, cerebrospinal fluid, pus, and other exudates)**
- **Infectious waste includes contaminated items but are less hazardous, such as used cotton, dressings, or gloves**
- **Non-infectious waste includes general waste like paper, packaging, and files**
- **Sharps include syringes, needles, broken glass, and slides**

US government, and the World Bank, these hubs are part of a broader sustainability strategy.

"The Government of Uganda has prioritised healthcare waste management under public financing, including operation and maintenance of incinerators," Nabaasa noted.

To supplement this effort, private waste handlers are also expanding capacity closer to the regions they serve. For example, Green Label Services, established two treatment plants: The Iganga Healthcare Treatment Plant, which uses incineration and the Mbarara Healthcare Treatment Plant, which relies on steam sterilisation. A third facility in Kamdini-Oyam, intended to support northern Uganda, stalled after USAID aid cuts in January.

At the facility level, experts stress the importance of planning and budgeting for their waste, as well

as having skilled operators.

Dr Bruno Oyik, the medical superintendent of Luwero General Hospital, recommends that all government health facilities employ trained incineration specialists to prevent breakdowns caused by unskilled staff.

Some clinics dump waste in communities to avoid disposal costs. To curb this, Oyik suggests that such clinics negotiate with nearby government facilities to jointly use incinerators rather than endanger residents.

Enforcement by the National Environment Management Authority (NEMA), through strict penalties, must be the backbone of Uganda's medical waste management. To make this effective, the Ministry of Health, the National Drug Authority (NDA) and professional councils, such as the Pharmaceutical Society of Uganda and the Dental Practitioners

Council should collaborate on building practical systems that ensure compliance.

The call was made by Dr Stella Maris Nanyonga, who is the former head of the Pharmaceutical Society of Uganda's AntiMicrobial Resistance Committee and now a research pharmacist at the University of Oxford.

Pharmacists, often the first point of contact for patients, should educate the public on safe disposal.

"Most people don't know which medicines are harmless or hazardous or controlled and thus make unsafe choices, such as flushing drugs into toilets or burning them, polluting soil, water and air and fuelling antimicrobial resistance," Nanyonga says.

She notes that burning medicines releases toxic smoke that irritates the eyes, damages the lungs and harms the wider community over time.

To dispose of expired or other unwanted drugs safely, she also proposes 'Medicine Take Back Days', where expired drugs are returned to designated facilities for safe storage, until the National Medical Stores collects them for destruction.

Beyond institutions, communities, too, play a role. They can document unsafe disposal sites, take photos and press authorities to act.

"Please, do not try to handle this kind of waste yourself. Report

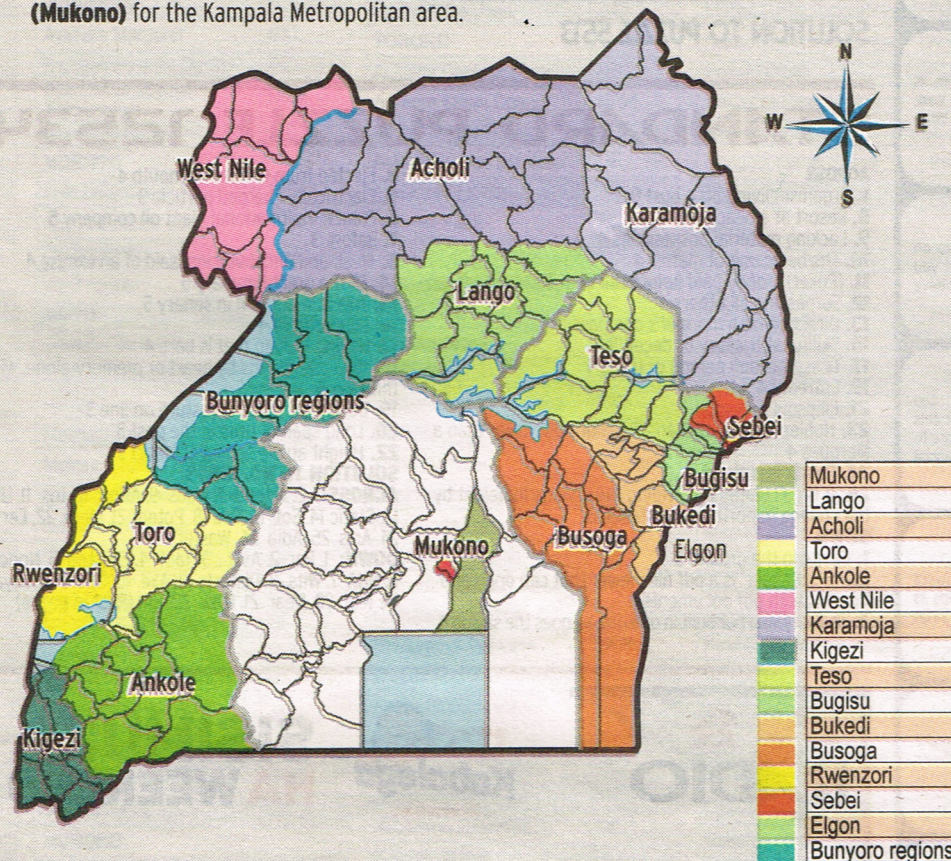
HEAL WITHOUT HARMING?

WORLD HEALTH ORGANISATION RECOMMENDATIONS

GRAPHIC BY PHILLIP NSAMBA

16 countrywide regional incinerator hubs

Commissioner for environmental health at the Ministry of Health, says the government has begun setting up **regional incinerator hubs**, with plans for 16 high standard facilities modelled on Nakasongola. Five are already under construction, including one in Ddundo (Mukono) for the Kampala Metropolitan area.



FACTORS TO CONSIDER

The Ministry of Health, through the 2022 National Guidelines for WASH in Health Care Facilities, outlines key considerations for selecting appropriate medical waste treatment and disposal technologies. These guidelines emphasise that the choice of technology must reflect both the capacity of the healthcare facility and the types of waste generated. Among the most important factors to consider are:

1. Waste characteristics
2. Quantity of wastes for treatment and disposal
3. Capability of the health-care facility to handle the quantity of waste
4. Types of waste for treatment and disposal
5. Technology capabilities and requirements
6. Local availability of treatment options and technologies
7. Capacity of the system
8. Treatment efficiency
9. Volume and mass reduction
10. Installation requirements
11. Available space for equipment
12. Infrastructure requirements
13. Operation and maintenance requirements
14. Skills needed for operating the technology
15. Environmental and safety factors
16. Location of the treatment site and disposal facility
17. Occupational health and safety considerations
18. Public acceptability
19. Options available for final disposal
20. Regulatory requirements
21. Cost considerations, that is, equipment purchase costs and shipping

before reuse.

TYING IT ALTOGETHER

From the banana plantations of Maya to new incinerator hubs across Uganda, medical waste tells a story of contradiction, that is, tools meant to heal now casting harm. The dangers of poor disposal are not distant, they unfold daily in homes, water sources and communities. Without urgent enforcement, sustained funding and citizen vigilance, Uganda risks healing by day and poisoning by night; a cycle only deliberate action can end.



PHARMACISTS, OFTEN THE FIRST POINT OF CONTACT FOR PATIENTS, SHOULD EDUCATE THE PUBLIC ON SAFE DISPOSAL OF MEDICINE.

hydrogen peroxide to destroy pathogens. It is simple and useful for liquid waste, such as blood or bodily fluids, but less effective for large volumes of solid waste and produces chemical residues. It should also be noted that chemicals can be hazardous to workers. Therefore, proper protective gear

and safe disposal of chemical residues are essential.

■ **Steam-based or hybrid systems (such as, hydroclaves):** Combine shredding and steam treatment in one unit and it reduces waste volume while sterilising it. They are more efficient than autoclaves alone, but require higher investment, regular technical maintenance regular performance checks and training for staff.

Beyond disposal, Nanyonga pointed to emerging innovations aimed at converting hazardous medical waste into useful products and reduce environmental harm. Such approaches include recycling plastics into building materials, converting treated waste into fuel or biogas and mixing shredded non-hazardous waste with cement to make eco bricks. Although these technologies are still in early stages in Uganda, experts stress that strict regulation is essential to ensure all waste is fully sterilised

■ **Autoclaving (Steam sterilisation):** Medical waste is placed in a machine that uses high-pressure steam to kill germs and viruses. It is effective at destroying infectious agents, produces no toxic smoke or ash, and can be used within hospitals. However, it requires regular maintenance and correct loading, electricity or fuel to produce steam and is unsuitable for plastics that can melt.

■ **Microwave treatment:** Waste is shredded and then exposed to microwave energy that heats it and kills micro-organisms. It is fast and energy-efficient, though expensive to install, requires skilled operators and reliable power. Operators should guard against overloading and make sure the waste is properly shredded for uniform treatment.

■ **Chemical disinfection:** Involves treating waste with chemicals, such as chlorine or

it to your local council, district health office, NEMA or the Police," Nanyonga advises.

And if someone is pricked by a needle, she says, they should seek immediate medical care for HIV post exposure treatment and tetanus vaccination.

Looking ahead, the Ministry of Health is moving to tighten the rules governing waste disposal. The ministry is developing a new law, that is, the Health Care and Waste Management Regulations.

According to Nabaasa, the law aims to close gaps in compliance and enforcement and is expected by early next year.

EXPLORING CLEANER ALTERNATIVES

Aside from incineration, experts like Nanyonga reveal that there are also environment-friendly waste treatment technologies that Uganda can adopt. These include autoclaving, microwave treatment, chemical disinfection and hybrid steam based systems.