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KENYA MEDICAL RESEARCH INSTITUTE
KEMRI
In Search of Better Health

KEMRI BULLETIN

SPECIAL EDITION

SPECIAL FEATURES

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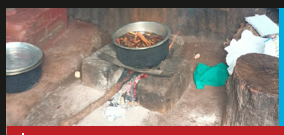


STORY IN PG. 15

The Smoke That Kills: Inside Kenya's Hidden Kitchen Crisis

KEMRI Announces Major Management Changes

The Institute made significant changes in top research leadership for various Centres and departments within the Institute

BY GIDEON KIRUI

The KEMRI Board of Directors has approved a raft of leadership and managerial changes affecting two major scientific research directorates, two western Kenya–based research stations and a number of Stations at the KEMRI Headquarters in Nairobi, in a bid to strengthen the Institute's operations and research output.

The affected directorates are the Directorate of Research and Development (R&D) and the Directorate of Scientific Programmes, Partnerships and Grants Management (DSPPGM), which were until recently headed by Prof. Nelly Mugo and Dr. Maricianah Onono, respectively.

In a series of official communications from the Office of the Ag. Director General, Prof. Elijah Songok, staff across departments, programmes, and centres were apprised of the changes and briefed on the expectations for the new appointees while heartly thanking the outgoing officers for their diligent service during their tenure at the respective offices.

...Continued

LEADERSHIP CHANGES

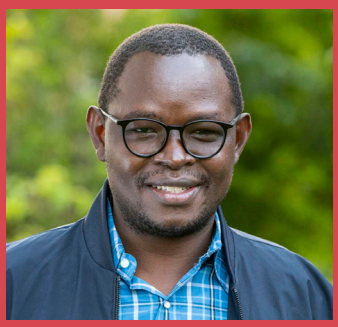
Highlights of the new Leadership

Dr. Erick Muok

Ag. Director, Research and Development (DRD)

Dr. Zipporah Bukania

Ag. Director Scientific Programs, Partnerships, and Grants Management (DSPPGM)



Dr. Erick Ochomo

Ag. Deputy Director, Centre for Global Health Research (CGHR)

Dr. Jeremiah Gathirwa

Ag. Deputy Director, Centre for Traditional Medicine and Drug Research (CTMDR)

Dr. Paul Gichuki

Ag. Deputy Director, Eastern and Southern Africa Centre of International Parasite Control (ESACIPAC)

Dr. Ferdinard Adung'o

Ag. Deputy Director Centre For Infectious And Parasitic Diseases Control Research (CIPDCR)

Dr. Priscah Otambo

Ag. Deputy Director Centre for Public Health Research (CPHR)

Dr. Eric Lelo
Ag. DD CBRD

Ag. Deputy Director, Centre for Biotechnology Research Programme (CBRD)

"These appointments reflect our commitment to nurturing leadership and ensuring continuity, while at the same time building on the remarkable achievements of our outgoing directors,"

Prof. Elijah Songok

Among the notable changes, Dr. Erick Muok, formerly Ag. Deputy Director at the Centre for Global Health Research (CGHR) in Kisumu, has been appointed Ag. Director of Research and Development, replacing Prof. Mugo. His appointment took effect on 1st August, 2025, and will run until 31st January 2026. Dr. Muok has in turn been succeeded at CGHR by Dr. Eric Ochomo, previously Ag. Deputy Director at the Busia-based, Centre for Infectious and Parasitic Diseases Research (CIPDCR). Dr. Ferdinard Adungo takes over at CIPDCR.

Meanwhile, Dr. Zipporah Bukania takes over from Dr. Onono as Ag. Director of DSPPGM from 1st, September, 2025, to 28th, February 2026. She is the immediate, Deputy Director at the Centre for Public Health Research (CPHR), a role that was recently assumed by Dr. Priscah Otambo for the same period.

Other appointments include, Dr. Eric Lelo, replacing Dr. Luna Kamau as Ag. Deputy Director, Centre for Biotechnology Research and Development (CBRD), Dr. Jeremiah Gathirwa, replacing Dr. Ruth Nyangacha as Ag. Deputy Director, Centre for Traditional Medicine and Drug Research (CTMDR), Dr. Paul Gichuki, replacing Dr. Doris Njomo as Ag. Deputy Director, Eastern and Southern Africa Centre of International Parasite Control (ESACIPAC). Also making it to the list is Dr. Sospeter Njeru who's steering research leaders at the Kirinyaga-based, Centre for Community Driven Research (CCDR) after receiving the baton from Dr. Esther Matu. Dr. Kamau and Dr. Njomo were substantive heads that completed their leadership tour of duty at their respective stations.

According to the Board, the changes are guided by the leadership skills, expertise, and experience of the appointees, as well as their strong track records within KEMRI. The move is also intended to inject fresh perspectives into the institute's work and to consolidate gains made across different research centres.

"These appointments reflect our commitment to nurturing leadership and ensuring continuity, while at the same time building on the remarkable achievements of our outgoing directors," noted Prof. Songok in the communication to staff.

The leadership changes underscore KEMRI's broader strategy to strengthen its role as Kenya's flagship health research institution, with a mandate to generate scientific knowledge, drive innovation, and inform policy in the fight against emerging, re-emerging, and neglected diseases.

KEMRI Joins Pre-TICAD 9 Roundtable in Yokohama

BY THE KEMRI BULLETIN REPORTER

Yokohama, Japan — Ahead of the official opening of the 9th Tokyo International Conference on African Development (TICAD 9) on 20th, August 2025, senior Kenyan health leaders participated in high-level roundtable discussions in Yokohama.

KEMRI Board of Directors Chairman Dr. Abdullahi Ali and Ag. Director General Prof. Elijah Songok joined Principal Secretary for Health Mary Muthoni, Director General for Health Dr. Patrick Amoth, and philanthropist Bill Gates in a pre-TICAD dialogue hosted by Japanese Member of Parliament Ichiro Aisawa.

TICAD, convened every three years, is a key platform for advancing African development, fostering international collaboration, and promoting co-created solutions to pressing health and socio-economic challenges facing the continent and the wider global community.

PS for Health Mary Muthoni (R), and philanthropist Bill Gates (C)

Pre -TICAD 9 high-level roundtable discussions in Yokohama, Japan

EACCR Stakeholders Meet in Nairobi to Map Next Phase of Clinical Research

BY STELLA NJUNG'E

The East African Consortium for Clinical Research (EACCR) has convened its annual stakeholders' meeting in Nairobi to take stock of achievements from Phase III and chart the roadmap for Phase IV.

The three-day forum, hosted by the Kenya Medical Research Institute (KEMRI) from 18th to 20th August 2025, has brought together more than 25 consortium members, drawn from various Institutions across the region's health and medical research sectors.

This year's meeting carries added significance as it coincides with the consortium's 15th anniversary. Since its inception in 2009 under EACCR I, the consortium has worked to build regional capacity for world-class health research, with a focus on clinical trials addressing poverty-related diseases such as HIV, tuberculosis, and malaria, as well as neglected, emerging, and re-emerging infectious diseases.

Opening the meeting, KEMRI's Acting Director of Research and Development, Dr. Erick Muok, commended the consortium's progress in fostering cross-border scientific collaboration and training. He emphasized that the next phase will be critical in consolidating gains made in research infrastructure, clinical trial capacity, and regional partnerships.

Over the years, EACCR has played a central role in positioning East Africa as a hub for health research by promoting joint projects, standardizing practices, and strengthening networks among scientists, policymakers, and healthcare institutions. The consortium has also been instrumental in supporting young researchers through training, mentorship, and access to multi-country research platforms.

As the stakeholders deliberate on priorities for Phase IV, discussions are expected to focus on sustainability, funding strategies, and scaling up research outputs to directly impact healthcare delivery and policy across the region.

The Nairobi meeting is also seen as an opportunity to reaffirm the consortium's commitment to tackling the continent's most pressing health challenges through regional solidarity and shared expertise.

The East African Consortium for Clinical Research (EACCR) Stakeholders in a photo

KEMRI's Acting Director of Research and Development, Dr. Erick Muok

The East African Consortium for Clinical Research (EACCR) Stakeholders Meeting

New KEMRI Graduate School Students Assured Of Support And Guidance During Orientation

BY GIDEON KIRUI AND BRIAN ORWA

The KEMRI Graduate School and Jomo Kenyatta University of Agriculture and Technology (JKUAT) have pledged to fully support and guide the first-year postgraduate students in the course of their studies.

Speaking during a jointly undertaken student orientation activity held on 18th August 2025 at the Kenya Medical Research Institute (KEMRI) Headquarters, the faculty from both institutions committed their accessibility and swift responsiveness to the students' welfare concerns.

Led by the coordinator of Public Health programme at the KEMRI Graduate School, Dr. Joseph Mutai who also represented the Ag. Director Research Capacity Building, Dr. Martin Bundi, the hybrid event taking place both physically and virtually provided an interactive and informative platform for the students, members of faculty, management, and other relevant departments to address critical issues pertaining to academics and administration.

It also offered a high-definition view of the recommended procedural structures with respect to research, thesis submission, project supervision, resource access, and fee payment, while dispelling confusion surrounding the adopted policies and systems.

The Ag. Deputy Director Trainee Welfare at the Graduate School, Dr. Elizabeth Matey, while addressing the students, invited them to freely air their concerns, share suggestions, network, and build meaningful connections across the divide for a shared convenience.

"The purpose of this meeting is to get to know each other and interact. At this level, you need to know your faculty and interact with them so that your time within this programme becomes smoother and easier. If you have an issue that you need to clarify, then this is the right forum," Dr. Matey stated.

The Ag. Deputy Director for Trainee Welfare at KGS, Dr. Elizabeth Matey

Dean, JKUAT's School of Public Health, Prof. Gideon Kikuvi

Public Health Course Coordinator, Dr. Joseph Mutai

Senior Librarian, Ms. Cynthia Kimani

KGS Information Scientist in charge of Admissions and Exams, Mr. Brian Orwa

Health, Safety and Environment Coordinator, Mr. Nicholas Mwikwabe addresses the students on Biosafety and Biosecurity

SERU's Mr. Geoffrey Sang addresses the students on research ethics requirements.'

Echoing the sentiments of Dr. Matey, Dr. Mutai called on the students and all the stakeholders to harmonize their interactions and move forward cohesively as a unified team bound by a clear understanding of what is expected of them.

"We are so happy and glad that you have gotten the opportunity to be here on this occasion. Our main function today was to meet and know each other, so that going forward we can know that we as a family we are moving towards the same direction," said Dr. Mutai. He further emphasized the Institute's accommodative nature, and extended an offer to the students to duly utilize the resources at their disposal.

The Dean of School of Public Health at JKUAT, Prof. Gideon Kikuvi on behalf of the Director, JKUAT Graduate School, clarified on the available courses offered by the KEMRI/JKUAT collaboration, their categorization, and domicile within respective schools and departments in the university.

"Ideally, we have all the programmes being managed from the Graduate School, but through the various schools we have at JKUAT and the KEMRI Graduate School. That means all the communication, since you were admitted from KEMRI, come through KEMRI through the various schools and then to the Graduate School where you were admitted and where you get administered," explained Prof. Kikuvi. He also urged the students to bear in mind that the programmes are ordered by coursework, research, thesis, and examination, to which he further recommended a closer working relationship with supervisors, course coordinators, and faces of administrative organs to prevent and\or overcome avoidable challenges in their pathway to success.

During the orientation, the students were urged to adhere to ethical grounds, understand administrative processes, observe the recommended communication channels, pay attention to timelines and do regular follow-ups, all with an aim to simplify and make things easier.

The students were also advised to give priority to their health by seeking regular medical check-ups and counselling, observing the provided safety protocols, and taking an active part in extra-curricular activities for a holistic development.

The orientation activity was preceded by a team building exercise on Friday 15th August 2025 following the completion of the first semester exams, during which the students and the KEMRI Graduate School staff participated in different sporting activities to unwind after an intensive academic session and prepare for the new semester.

Climate Change Rewriting Kisumu's Story of Disease & Survival

BY ZADOCK OBUYA

In the rural landscape of Western Kenya, climate change is no longer just an abstract global crisis, it is a lived reality with profound health consequences. Along the lake region, rising temperatures, unusual rainfall patterns, prolonged droughts, and heatwaves are not only reshaping the environment but also fuelling the spread of Neglected Tropical Diseases (NTDs) such as schistosomiasis and soil-transmitted helminths (STHs).

Long dismissed as ***"diseases of the poor,"*** NTDs are gaining new ground as ecological changes bring parasites and their hosts closer to vulnerable communities. Globally, more than a billion people are affected by NTDs, with the World Health Organization (WHO) estimating that they cause hundreds of thousands of preventable deaths every year.

Dr. Martin Mutuku, an NTD expert from the Kenya Medical Research Institute (KEMRI), explains the link. **"Rising temperatures and unpredictable rainfall are creating ideal conditions for parasite transmission. Seasonal flooding and backflows from Lake Victoria provide perfect breeding grounds for the freshwater snails that carry schistosomiasis,"** he told this writer recently.

In Kisumu County, which has eight sub-counties, communities in Nyando and Kadibo are among the worst affected by these climate-driven health threats. Kadibo, in particular, has borne the brunt of flooding and displacement linked to changing weather patterns.

The risks are not new. As early as 1966, the Government of Kenya foresaw potential dangers from flooding and lake backflows in Kadibo and relocated residents to the Muhoroni settlement scheme. But when the weather stabilized, many families moved back, rebuilding homes and livelihoods along the lakeside.

For decades, life went on without major disruption, until 2019, when disaster struck.

Ms. Caroline Achieng' Odhoch, a long-time resident of Kakola-Ombaka village, recalls the turning point. "We had always lived with seasonal floods and heatwaves, but in 2019 the rains were unlike anything we had ever seen. Within weeks, our homes were submerged. Entire villages were displaced, and many of us had to camp in schools on higher ground," she said.

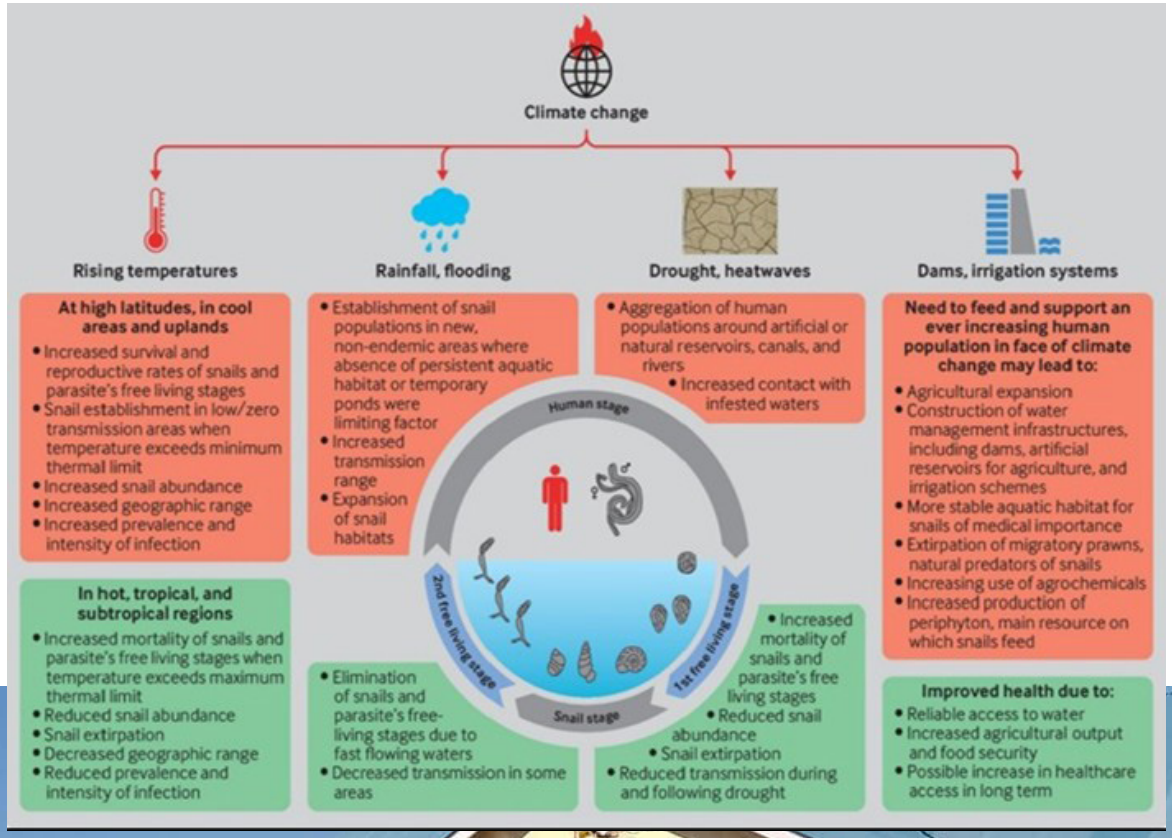
With schools and homesteads under water, canoes and boats became the only means of transport. Those who could not access them were forced to wade through floodwaters daily.

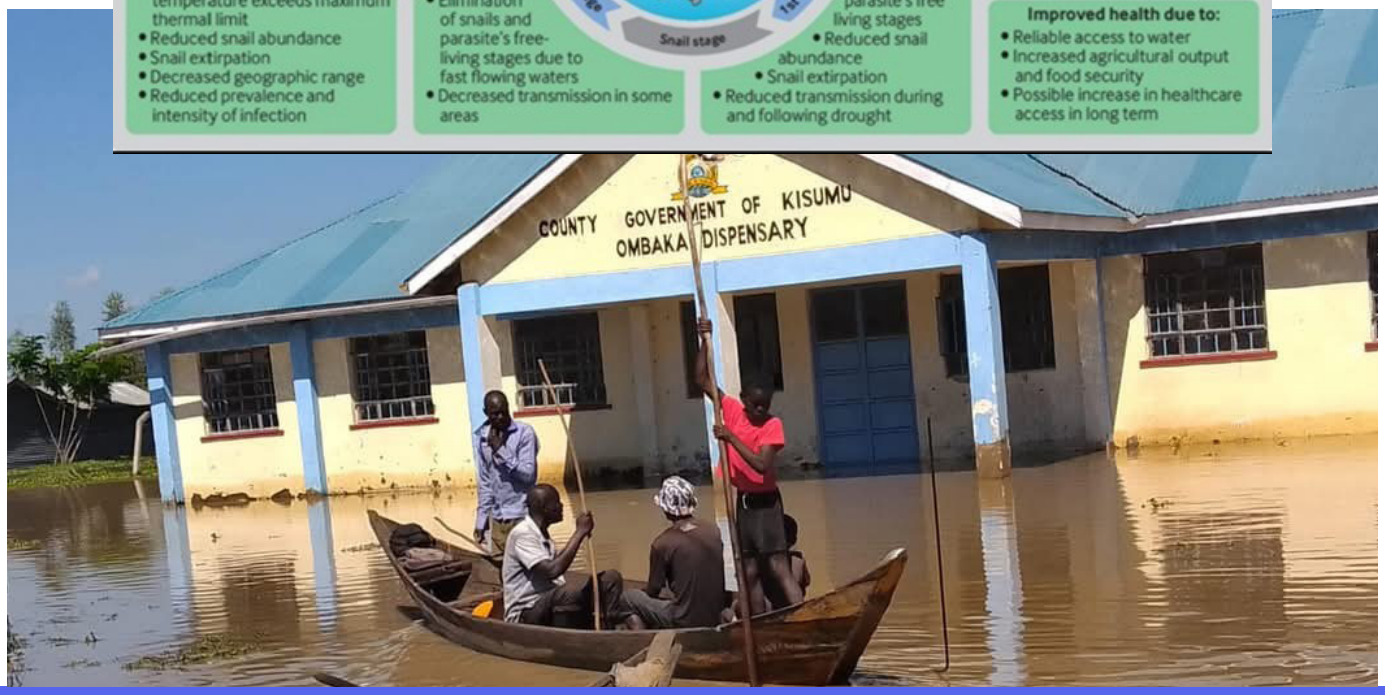
But the environmental damage quickly spiraled into a public health crisis. Ms. Carren Onjala, a local Community Health Promoter, recounted how pit latrines collapsed into the floodwaters, contaminating stagnant pools with human waste. **"The faeces mixed with the water, creating breeding grounds for snails and mosquitoes. Sanitation systems were destroyed, and there was no clean water for households,"** she explained.

The situation worsened as warmer temperatures accelerated parasite life cycles. Mr. Erick Otieno, the area Public Health Officer, noted: **"The combination of flooding, heat, and poor sanitation has changed disease patterns. Parasite populations are increasing, and we are seeing higher rates of schistosomiasis and intestinal worms in children."**

For families living below the poverty line, moving away from the flood-prone areas was not an option. Communities adapted to their new reality, but exposure to contaminated water became unavoidable. Children, in particular, faced the greatest risks.

This view is aptly put by Ms. Prisca Awuor, a teacher and resident. Awuor describes the daily dangers, thus, **"I often see pupils playing in stagnant water before and after school. These waters contain the intermediate hosts of schistosomiasis and other parasites, putting children directly at risk".**





The impact has been devastating. Children miss school due to recurrent illness, families spend scarce resources on treatment, and the cycle of poverty and disease deepens.

Experts warn that the situation in Kadibo is a stark warning of how climate change is amplifying neglected diseases across Africa's vulnerable regions. Without urgent interventions in water, sanitation, and climate adaptation, the burden of NTDs will continue to rise.

For Dr. Mutuku and his colleagues at KEMRI, the message is clear: **"We must integrate climate change into our public health planning. Communities like Kadibo are on the frontline, and unless we act, the spread of these diseases will outpace our ability to control them."**

As Kisumu County grapples with the realities of climate-linked disease outbreaks, the voices from Kakola-Ombaka remind us that the battle against climate change is not only about saving the environment—it is also about saving lives.

Improper Medical Waste Disposal Poses Silent Threat to Public Health

BY JACINTA MAIGA

Three years ago, Paul Otieno, a cleaner at a county hospital, suffered a needle prick injury while on duty. At first, it seemed like a minor incident. But months later, his skin turned yellow, and he experienced fever, nausea, and fatigue. After a long and confusing medical journey, tests revealed he had chronic hepatitis C, a condition that scars and slowly destroys the liver.

Paul's case highlights a grim reality: improper medical waste disposal — including carelessly discarded needles and syringes — poses a direct threat to public health. Without safe handling, such waste can spread hepatitis, HIV, and other life-threatening infections.

According to the medical superintendent at Kayole II Level IV Hospital, Dr. Ruth Kiato, poor medical waste practices undermine both safety and trust in healthcare. **"Training staff on proper waste management protects employees, patients, and enhances public confidence,"** she explains.

Dr. Kiato stresses five critical areas of training including waste segregation, safe handling and use of protective gear, proper documentation and compliance, emergency procedures in case of spillage, and ongoing refresher courses to keep workers updated.

But training alone is not enough. In many hospitals, overflowing bins, broken incinerators, and weak oversight turn what should be healing spaces into hotspots for infection.

The dangers do not end within hospital walls. In Kayole, Raphael, a waste collector who has worked at a dumpsite for 15 years, describes the daily risks. **"We see syringes, blood-stained cotton, even aborted fetus dumped here. To avoid arrest, people burn the waste in the open air,"** he explains.

Open burning of medical waste releases a toxic cocktail of pollutants, including dioxins, furans, sulphur dioxide, and nitrogen oxides. These gases have severe health impacts ranging from asthma and bronchitis to cardiovascular problems, cancer, and reproductive disorders.

Raphael admits that some clinics and chemists pay street boys as little as fifty shillings to dump medical waste illegally. **"It's dangerous for us and for the river nearby,"** he avers, pointing to the Ngong River, where syringes and biomedical waste often end up.

Kayole Dumping Site

County governments play a central role in addressing the crisis. A Chief Officer for Environment in Nairobi County, Mr. Geoffrey Mosiria notes that counties are responsible for training health workers and supervising waste operations. **"We raise public awareness, oversee contractors, and collaborate with healthcare facilities and NGOs to ensure waste is disposed of safely,"** he says.

At the national level, frameworks such as the Public Health Act, Environmental Management and Coordination Act, and the Occupational Safety and Health Act provide the legal backbone for safe waste disposal.

According to Assistant Director of Public Health, Mr. Lolem Lokolile, these laws guide everything from segregation to transport and treatment. Kenya also aligns with global trends, moving away from incineration toward safer, non-incineration technologies such as autoclaving, microwaving, and chemical treatment.

The National Environment Management Authority (NEMA) is the watchdog. It licenses transporters, treatment facilities, and disposal sites, while monitoring municipalities to ensure compliance. **"In urban areas, waste volumes are high. Monitoring ensures processes don't expose the public to health risks or pollute natural resources,"** says NEMA's head of Environmental Impact Assessments, Mr. Francis Chwanya.

Assistant Director of Public Health, MoH, Mr. Lolem Lokolile,

Kayole Dumping Site

Medical waste is not just a hospital problem, but a community problem. When syringes end up in dumpsites, rivers, or are burned in the open, they expose entire populations to avoidable health risks. Open dumping contaminates soil and water, while toxic fumes worsen air pollution and climate change.

Experts argue that safe waste disposal should be treated as a public health priority equal to vaccination or sanitation. It requires a three-pronged approach: investment in modern disposal technologies, strict enforcement of laws, and public awareness campaigns to hold health facilities accountable.

Paul Otieno's story is a stark reminder that unsafe medical waste disposal is not an abstract issue but a human one. For Raphael and countless others working at dumpsites, the risks are daily and deadly. For patients and health workers, it is a hidden danger within the very facilities meant to heal.

The shift toward safer, non-incineration technologies is both urgent and achievable. But it will require strong political will, funding, and cooperation among counties, regulators, and healthcare providers.

In the words of Dr. Kiato: **"Safe medical waste management is not just about compliance. It is about dignity, safety, and protecting the lives of those we serve."**

The Smoke That Kills: Inside Kenya's Hidden Kitchen Crisis

BY ROISA KERRY, PUBLIC HEALTH JOURNALIST

The late afternoon sun spills over the hills of Ngong in Kajiado County, painting the sky in hues of amber and rose. In a tin-roofed home in Nalepo, 36-year-old Mary Naserian crouches over a three-stone fire. Smoke curls around her, stinging her eyes as she fans the flames beneath a pot of maize and beans. The acrid haze clings to her hair, her clothes, and her lungs.

"My mother cooked like this, my grandmother too," she says, coughing lightly. "We never thought the smoke could kill us."

Mary Naserian cooking using clean cooking projects stove

For Mary, and thousands like her in Kibiko and Nalepo, cooking is not just about feeding a family. It is survival, tradition, and community. But it also comes at a deadly cost- the silent danger of indoor air pollution.

Researchers now content that indoor air pollution is one of the world's least discussed but deadliest health risks. According to the World Health Organization (WHO), it causes 3.2 million premature deaths every year — more than HIV/AIDS, malaria, and tuberculosis combined. The causes are well known: household use of solid fuels such as wood, charcoal, dung, and crop residues, burned in open fires or inefficient stoves. Globally, nearly 2.3 billion people are exposed daily.

In Kenya, about 70 percent of households still cook with these fuels. In rural and peri-urban communities like Kibiko and Nalepo, kitchens are often poorly ventilated, with smoke levels reaching 10 times higher than the WHO's recommended safe limits for fine particulate matter (PM2.5). In Kajiado County, respiratory diseases consistently rank among the top outpatient cases.

Kenya Medical Research Institute (KEMRI) scientists have linked prolonged smoke exposure to higher risks of acute respiratory infections in children and chronic lung disease in adults. At Oletepes Health Centre, nurse Wesley Mochama sees the toll daily. **"Children come in with persistent coughs and wheezing. Mothers complain of headaches and burning eyes. Almost every time, the root cause is the same — smoky kitchens,"** he explains.

Deaths

3.2 million

According to the World Health Organization (WHO), it causes 3.2 million premature deaths every year

Global Population

2.3 billion

household use of solid fuels such as wood, charcoal, dung, and crop residues, burned in open fires or inefficient stoves. Globally, nearly 2.3 billion people are exposed daily.

Kenyan households

70%

70 percent of households still cook with these fuels. In rural and peri-urban communities like Kibiko and Nalepo, kitchens are often poorly ventilated.

It gets worse as the health costs of indoor air pollution are not borne equally. Women and children pay the highest price. Women like Mary spend long hours each day tending fires in kitchens that double as smoke chambers. Children, strapped to their mothers' backs or playing nearby, breathe in the same toxic fumes.

Naserian Women Group- last mile entreprenuers

Studies show children under five are at the greatest risk of smoke-induced pneumonia while the economic impact is also gendered. Women lose hours collecting firewood, while families spend money on preventable hospital visits. For many, the energy poverty that keeps them bound to smoky kitchens also perpetuates cycles of illness, missed school days, and lost productivity.

Change, however, is beginning to take root. In Nalepo and Kibiko, a handful of households have shifted from three-stone fires to improved clean cooking stoves which are basically simple innovations that burn fuel more efficiently and produce far less smoke.

The difference is striking: kitchens once blackened by soot now have cleaner walls, mothers cook without streaming eyes, and children coughing less. Families are also saving money on firewood.

Yet adoption remains stubbornly low. A 2022 survey by GIZ found that while 82 percent of households had heard about improved stoves, only 23 percent were using them regularly. The barriers range from affordability and durability concerns to deeply ingrained cultural habits. **"If I could get one on credit, I'd try,"** Mary admits. **"But paying at once is impossible."**

GIZ, Ministry of Energy flagging off Tuk-Tuk (below) and pickups to support clean cooking projects

Clean cooking projects stove

To address, Mary's concerns, solutions against the crisis of indoor air pollution are within reach. They include affordable financing in which the Pay-as-you-go models, loans, or savings groups can make stoves more accessible. There is also the Cultural adaptation in which stove are designed to match local cooking preferences to accommodate cooking habits. **"If it cannot cook ugali properly, it will not replace the three-stone fire".**

Traditional three stones cooking

Other strategies include sensitizing communities through Community health workers about the dangers of smoke and the integration of clean cooking into Kenya's national health and energy priorities. Key action groups, NGOs and donors like GIZ and the Clean Cooking Alliance should be roped into scaling access sustainably of this new model.

The women of Kibiko and Nalepo represent millions worldwide still cooking in smoky kitchens. In Kenya, tackling indoor air pollution aligns with national health goals, climate action, and gender equity. Globally, it advances the Sustainable Development Goals. It is also a matter of justice: no woman should have to sacrifice her lungs to put food on the table.

Back in Nalepo, Mary lifts her pot off the fire, eyes watering. A neighbour tells her about her new stove and how her kitchen is now smoke-free. Mary dreams of the same relief. **"The smoke has always been part of our lives," she says softly. "But maybe it doesn't have to be."**

Change is possible. It is already visible in homes where clean stoves are being adopted: healthier families, brighter kitchens, empowered women. But for that change to reach everyone, it will take sustained effort, affordable access, and the belief that no meal should come at the cost of someone's lungs.

The smoke may be an old companion in these kitchens, but communities are ready to leave it behind. The question now is whether the rest of us — policymakers, innovators, donors, and citizens — will help clear the air.

Smoke free kitchen with clean cooking

Clean cooking -Clean Air- Healthy Living

Improved jikos under production; climate action and sustainable future

www.kemri.go.ke