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AFRICA HEALTH NEWS

**Basic Health Infrastructure**

# PUBLIC-PRIVATE PARTNERSHIP LAUNCHES MAJOR CAMPAIGN TO REVOLUTIONIZE SANITATION

**A global public-private partnership launched a major initiative in July at the 2011 AfricaSan Conference in Kigali, Rwanda, to make sanitary toilet facilities both accessible and affordable to the estimated three billion people in developing countries who still lack basic sanitation.**

Only 36% of people in sub-Saharan Africa (SSA) have access to adequate toilet and hand-washing facilities, according to the World Health Organization (WHO), and inadequate human waste management causes an estimated 1.5 million deaths among children each year from diarrheal disease. Safe sanitation is also critical to economic growth. The WHO reports that improved sanitation can produce up to $9 for every $1 invested by increasing productivity, reducing health care costs and preventing illness, disability and early death.

Scaling up access to safe toilet facilities is considered fundamental to improving health in developing countries. Speaking at the AfriSan Conference, Mr. Frank Rijsberman, Director of the Bill & Melinda Gates Foundation's Water, Sanitation and Hygiene Initiative, said that the introduction of the flush toilet in the 18th century "saved more lives than any innovation in the history of public health or medical science." The initiative is also geared to advance progress towards the seventh United Nations Millennium Development Goal calling for halving the proportion of the world's population without sustainable access to safe drinking water and basic sanitation by 2015.

The Gates Foundation, which has a long history of supporting water and sanitation in developing countries, will be the major funding partner in the initiative. In total, it plans to award $42 million in grants to spur innovations in the capture and storage of waste, as well as its processing into reusable energy, fertilizer and fresh water.

Other partners in the initiative include the African Development Bank (AfDB), the US Agency for International Development (USAID), the German Agency for International Cooperation (GIZ), the Government of Kenya, the United Nations Educational, Scientific and Cultural Organization (UNESCO) and research teams from eight universities from Africa, Asia, Europe and North America. The teams were chosen from a field of 22 research institutions that competed in a Gates Foundation "Reinvent the Toilet" challenge. The competition called on contesting research groups to develop a sanitary, ecologically sound toilet that also costs less than 5 cents a user per a day to operate and maintain. Challenge winners, who will share $3 million in grants, include:

- **The University of KwaZulu-Natal** in South Africa where researchers will design a community bathroom block that mineralizes human waste and recovers clean water, nutrients and energy;
- **Loughborough University** in the United Kingdom which aims to develop a toilet that produces biological charcoal, minerals and clean water;
- **Delft University of Technology** in the Netherlands where researchers will develop a toilet system that will apply microwave technology to transform human waster into electricity;
- **The Swiss Federal Institute of Aquatic Science and Technology** which proposes to design a urine-diverting toilet that recovers clean water on site;
- **Stanford University** in the United States where researchers will design a self-contained system that decomposes human waste into a type of biological charcoal that is used for carbon capture and storage;
- **The University of Toronto** in Canada, which will develop a toilet that uses mechanical dehydration and smoldering of human feces to recover resources and energy;
- **The California Institute of Technology** in the United States where researchers plan to build a solar-powered toilet that generates hydrogen and electricity for local use; and
- **The National University of Singapore**, which will develop a pneumatic flushing urine-diversion and dehydration toilet.

*A urinary diversion toilet developed with funding from a 2009 Gates Foundation grant by researchers at the University of KwaZulu-Natal in South Africa.*

The Gates Foundation will also contribute $12 million to the AfDB for the development of sanitation pilot projects in sub-Saharan Africa, with the goal of extending sanitation facilities to 1.5 million urban dwellers. USAID will match an $8.5 million Gates Foundation grant to identify, test and help scale up evidence-based approaches to deliver water, sanitation and hygiene services to underserved populations.

In a project co-funded by the GIZ and the Kenyan government, the Gates Foundation is providing $10 million to support efforts to scale up sustainable sanitation services for up to 800,000 people and water services for up to 200,000 residents of low-income urban areas in Kenya.

UNESCO's IHE Institute for Water Education, supported by another $8 million-Gates Foundation grant, will transform postgraduate water and sanitation education systems through an increased focus on pro-poor solutions and a strong online curriculum that will reduce costs and increase accessibility to higher education.

Improving Health Care Delivery

# STUDY PROVES BENEFITS OF TEXT MESSAGING TO CONTROL MALARIA

**In the first ever study to examine the impact of text messaging on the effectiveness of health workers, researchers from Oxford University reported in *The Lancet* medical journal that sending daily text message reminders can lead to more patients receiving correct antimalarial treatment.**

The study's results are among the first hard evidence that Africa's exploding mobile phone use holds real potential for revolutionizing health care delivery to the continent's underserved populations. Mobile phones represent 90% of phone access in Africa with market penetration now at more than 50%.

Researchers found that sending two daily text message reminders to 119 health workers from 107 rural health facilities across Kenya, resulted in almost 25% more children receiving the recommended treatment for malaria. The reminders had two parts: one included recommendations about pediatric malaria-case management from Kenyan national guidelines and training manuals, and the other was a motivational quote.

Immediately after the start of text messaging, correct artemesinin-combination therapy (ACT) management improved by 23.7% and increased to 24.5% six months later.

"The simplicity and low cost of text messaging means that widespread implementation of an intervention that uses this technology can be done quickly and successfully," said Dr. Bob

Snow, a lead researcher in the study and head of the Kenya Medical Research Institute-Wellcome Institute in Nairobi. "The cost of a text message in Kenya is about one cent, resulting in the cost of full exposure to our intervention of $2.60 per health worker, or $39,000 if scaled up to an estimated 15,000 health workers in all rural facilities nationwide."

The study's authors recommended that text-messaging be used to complement traditional approaches to support clinical management such as in-service training of health workers and supportive supervision.

Like checklists, which are gaining in popularity in US and international healthcare settings, the research team suggested the text messages can serve as a reminder to health care workers and patients alike of the clinical importance of routine tasks associated with treatment.

Treatment Integration

# GROWING EVIDENCE LINKS NEGLECTED TROPICAL DISEASES TO HIV TRANSMISSION

**As evidence mounts showing a connection between neglected tropical diseases (NTDs) and HIV/AIDS transmission, health experts are calling for greater integration of national NTD programs with HIV/AIDS initiatives.**

An editorial, published in July in *Public Library of Science Neglected Tropical Diseases*, cites studies that show that areas of high NTD infection are often the same as those with a high prevalence of HIV/AIDS. Furthermore, there is clinical evidence that the risk of contracting HIV/AIDS can be heightened by certain NTD co-infections, particularly female genital schistosomiasis, a common condition in sub-Saharan Africa that more than triples a woman's chance of infection by the HIV virus. Helminth infections have also been found to increase the risk of mother-to-child transmission of HIV.

Based on the evidence, the editorial's authors - Ms. Julie Norblick, MPH; Mr. Richard Skolnik, MPA; and Dr. Peter Hotez - advocate the integration of the delivery of antiretroviral (ARV) drugs with NTD control and elimination programs. They also call for research to monitor and evaluate the success of NTD and HIV/AIDS cross-treatment.

A corollary benefit, the authors noted, would be increased focus on NTDs, which traditionally have been underfunded.

Access to Drugs

# GILEAD JOINS PATENT POOL FOR AIDS DRUGS

**Gilead Sciences in July became the first biopharmaceutical research company to agree to share the formulae for its antiretroviral (ARV) medications with the Medicines Patent Pool.**

Until now, manufacturers of HIV drugs have made separate agreements to supply ARVs at substantially-reduced cost to developing countries. The patent pool, founded in 2010 by the health financing mechanism UNITAID, has been described as "a one-stop shop," that creates a system for patent holders to license technology to makers of generics in exchange for modest royalties. It is also hoped that the pool will spur innovation as formulae become more available to researchers.

Under its agreement with the patent pool, Gilead allows for the production of generic copies of tenofovir, emtricitabine, cobicistat and elvitegravir, as well as a combination of these products in a single pill knows as the "Quad." Gilead will receive a 3% royalty on generic sales of tenofovir, which is also approved for use in hepatitis B, and 5% on the other products covered by the agreement.

"[The agreement] marks a milestone in managing patents for public health," said Ms. Ellen 't Hoen, Executive Director of the Medicines Patent Pool. "The license agreement with Gilead Sciences will help make medicines available at a lower-cost and in easier to use formulations without delays. People in developing countries often have to wait for years before they can access new health technologies. Today's agreement changed that."

An estimated 33 million people worldwide are currently living with HIV, 22 million of whom live in Africa. Forty percent of those in Africa in need of ARVs are not yet receiving them.

Negotiations are currently underway between the patent pool and other HIV drug manufacturers including ViiV Healthcare (a joint venture of GlaxoSmithKline and Pfizer), Bristol-Myers Squibb, Roche, Boehringer Ingelheim and Sequoia Pharmaceuticals.

"We believe the pool is an innovative mechanism to increase access to patented medicines in a way that works for the pharmaceutical industry and people living with HIV," said Mr. Gregg Alston, Executive Vice President, Corporate and Medical Affairs for Gilead Sciences.

The Power of Partnership

## ROCHE PARTNERING WITH SOUTH AFRICA IN LANDMARK INFANT HIV TESTING INITIATIVE

**Bio-pharmaceutical research company Roche will partner with South Africa's National Health Laboratory Services (NHLS) to deliver state-of-the-art diagnostics to support the world's largest initiative to date to identify HIV-infected children in their first months of life.**

The new infant testing initiative is part of the massive HIV testing and counseling campaign launched in 2010 by the Government of South Africa, which estimates that 40,000 South African children are infected with HIV each year, largely through mother-to-child transmission. In 2010, South Africa's AIDS-related infant death rate was 46.9 per 1,000 infants, down from 56.9 deaths per 1,000 in 2001.

Most HIV diagnostics test for antibodies, but accurately diagnosing HIV in infants using this method is ineffective because the mother's antibodies remain in the child's system for up to 15 months following birth. Roche diagnostics tests for viral load in the bloodstream using the dried blood sampling (DBS) technique in which a spot of blood is preserved on filter paper and sent to a testing center. The method is both accurate and less stressful for the mother and child. It also eliminates the need for refrigeration and reduces the volume of blood that needs to be stored and transported.

Without access to antiretroviral (ARV) drugs about one-third of infants infected with HIV die before their first birthdays, and 50% by the age of two. The World Health Organization (WHO) reports that in 2009 only 6% of babies born to HIV-positive mothers received an HIV test within the first two months of life.

Photo: USAID

*An infant is undergoes HIV testing by dried blood sampling.*

Roche's partnership with South Africa dates back to 2002, when the pharmaceutical company launched its AmpliCare program that seeks to increase access to HIV/AIDS diagnostics and monitoring tests to developing countries. AmpliCare also has programs to train health workers in the use of the tests and treatment.

Through the program, Roche supplies HIV diagnostic and viral load tests at heavily discounted prices to Least Development Countries (LDCs). According to Roche, over 1,100,00 infants have been tested for HIV through AmpliCare, and about 560,000 patients on HIV/AIDS therapy have had their viral loads monitored.

HIV Treatment Success

## ARVs BRING NEAR NORMAL LIFE SPAN IN UGANDA

**An actuarial analysis of 22,000 HIV-positive Ugandans taking antiretroviral (ARV) drugs has shown that they can expect to live almost as long as their fellow countrymen who are not infected with the virus. The life expectancy at birth of Ugandan males is 55.**

Published in the *Annals of Internal Medicine* in July, the analysis was hailed by health experts as proof of the value of ARV therapy even to those who begin to use the life-saving drugs much later than is recommended by the World Health Organization (WHO), and usually after their immune systems have become seriously compromised.

"No one really foresaw how effective these drugs would be, and how many people could be treated late in infection and still have their immune function largely restored," Dr. Deborah Cotton of Boston University School of Medicine told *National Public Radio.* "We knew it was good. It turns out to be great."

The global AIDS community is hopeful that the news will reinvigorate commitments by cash-strapped donor governments to continue funding HIV treatment in Africa and the rest of the developing world. It is also hoped that the findings will both encourage people to be tested and come forward for treatment if they test positive.

Regional Solutions

## EAC DEVELOPS PLAN TO COUNTER DEADLY FEVERS

**East African Community health experts, meeting in July in Entebbe, Uganda, announced the development of a regional policy to address outbreaks of often fatal viral hemorrhagic fevers such as Ebola, rift valley fever, yellow fever and Marburg fever.**

The new policy is part of a growing number of regional health initiatives to improve integrated disease surveillance and response, and enhance cross-border communications and data sharing.

Funded in part by a $16 million loan from the World Bank, the Viral Hemorrhagic Fevers (VHFs) Strategic Emergency, Preparedness and Contingency Plan: 2012 - 2016 seeks to build the financial, technical and human resource capacity to respond to disease outbreaks, as well as build a sustainable regional infrastructure to support a speedy and effective response.

While VHF's are limited to outbreaks rather than ongoing prevalence (as in the case of HIV/AIDs, malaria and tuberculosis), they nevertheless exact an enormous toll due to ease of transmission and high mortality rate. Often, a lack of resources and coordinating capacity has meant that outbreaks have been difficult to detect and confirm, undermining a rapid and widespread response.

Recent VHF outbreaks in the EAC include occurrences of yellow fever in Uganda in 2010/2011, Marburg fever in Uganda in 2007/2008, Ebola in Uganda in 2007, and Rift Valley fever in Kenya and Tanzania in 2006/2007.

"It is possible that many more outbreaks could be occurring but are not reported due to the current limited capacity for early detection, reporting, investigation and response at regional, national and sub-national levels," said Dr. Stanley Sonoiya, the EAC's Principal Health Officer. *(See Leader in Health column on page 4.)*

As well as coordinating member state government health policies, the EAC (comprising Burundi, Kenya, Rwanda, Tanzania and Uganda) is also working with the East, Central and Southern Africa Health Community Secretariat, the World Health Organization (WHO), the US Centers for Disease Control and Microsoft Corporation.

## ▪ SWEATY SOCK SMELL USED TO LURE MOSQUITOES

**In what has been hailed as a low-tech and inexpensive method of malaria control, researchers at Tanzania's Ifakara Health Institute have developed a powerful serum that mimics the smell of sweaty socks to lure mosquitoes into a trap.**

"We know mosquitoes don't see people, they smell them," Mr. Fredros Okumu, the lead researcher for the project, told CNN News. "Substances we emit when we sweat, such as lactic acid, act as a signal to mosquitoes. The aim here was to produce a mixture that would mimic a human being."

Working with villagers in malaria endemic communities in Tanzania, Mr. Okumu's research team produced a serum that is four times more powerful in attracting mosquitoes than natural human odor. The malaria vectors are lured into "mosquito landing boxes" by the synthetic odor that is dispersed by a solar-powered fan. Once inside the box, the mosquitoes are trapped and poisoned by a sticky substance.

Mr. Okumu, a PhD student at the London School of Hygiene and Tropical Medicine, is hoping to make the traps sustainable and accessible to all communities by developing the boxes' solar-panel technology to supply energy to people's homes and by substituting the expensive chemical mosquito lure with actual foot odor collected from cotton pads placed in people's socks.

The research project is being funded by a $775,000 joint grant from the Bill and Melinda Gates Foundation and the non-profit organization Grand Challenges Canada.

## ▪ NTD DRUG CUTS MALARIA TRANSMISSION

**Scientists from Senegal and Colorado State University announced in July that transmission of malaria by mosquitoes fell substantially over two weeks among people in two Senegalese villages who were taking the drug ivermectin, usually used to treat the neglected tropical disease (NTD) onchocerciasis (river blindness).**

Researchers collected mosquitoes from villages where people were taking ivermectin and compared them to mosquitoes gathered from villages where people were not taking the drug. In those places where people were taking ivermectin, there was a 79% decline in mosquitoes carrying the malaria parasite Plasmodium falciparum. In villages where ivermectin was not in use, malaria-bearing mosquitoes increased by 246% over the same period.

The drug, donated free to African countries where river blindness is endemic by bio-pharmaceutical research company Merck, has also been found to be effective against a variety of parasitic worms including those that cause elephantiasis.

## ▪ BAYER UNVEILS LONGER-LASTING BEDNET

**The World Health Organization (WHO) gave an interim recommendation in July that a new long lasting insecticide-treated bednet be introduced in malaria-endemic countries. The new LifeNet bednet is manufactured by Bayer CropScience, a sub-group of bio-pharmaceutical research company Bayer AG. The new bednets remain viable and effective for over 35 washes, a substantial improvement on the bednets currently used to protect sleepers against mosquitoes.**

LifeNet is the first innovation in the bednet field in more than a decade. For the first time, deltamethrin, the active ingredient recommended by the WHO, has been directly integrated into a polypropylene fiber. The insecticide is gradually released ensuring long-lasting effectiveness. In addition, the new nets are softer and more tear resistant than the nets currently in use, making them more user-friendly.

## ▪ NEW SMART PHONE LENS DETECTS MALARIA

**Scientists at the University of California Davis will soon begin field testing "Lifelens," a smart phone-operated micro-lens that can confirm the presence of malaria by capturing high resolution images of cells in a drop of blood.**

While initially more expensive than the disposable diagnostic tests currently in use in sub-Saharan Africa, the new technology gives an accurate malaria diagnosis within a minute - as opposed to half-an-hour - and will ultimately prove more cost effective over the long term because it can be used repeatedly.

Lifelens runs on Windows Phone 7 software. The images are captured by a $50 lens mounted over the phone's camera.

*Leaders in Health*

## *Dr. Stanley Sonoiya*
## *Principal Health Officer*
## *East African Community*

**As East Africa moves towards greater economic integration, it is also working to harmonize health policies to more effectively address disease outbreaks, fight pandemics like HIV/AIDS and malaria, and end the scourge of counterfeit drugs.**

For the past seven years, Dr. Stanley Sonoiya, Principal Health Officer of the East African Community (EAC), has played a major role in developing a regional health strategy for the EAC member states - Burundi, Kenya, Rwanda, Tanzania and Uganda.

Cognizant of member states' limited resources, Dr. Sonoiya has identified targeted regional interventions with the potential to deliver big results - for example, the initiative he led to harmonize HIV policies throughout EAC national armies. "It is a losing investment to train an army that is HIV-infected," he said. "It's both a national and regional security threat."

Dr. Sonoiya believes that the key to improving the health of the 133 million citizens of the EAC is to build a strong regional health infrastructure. Under his leadership, the EAC has developed a Public Health Laboratory Network and is currently working on a harmonized regional regime for the registration of medicines.

Before he joined the EAC in 2004, Dr. Sonoiya, a native of Kenya, was a medical specialist in Pediatrics, Nephrology and Immunology at Kenyatta National Hospital in Nairobi. He has also worked in various capacities within Kenya's Ministry of Health and was the National Manager of the Kenya Expanded Program on Immunization (KEPI).

Dr. Sonoiya was educated at the University of Nairobi in Kenya, Sheffield Kidney Institute and the University of London in the United Kingdom and Harvard University School of Public Health in the United States.