Ebola: Is developing a vaccine the answer?

Uganda set to roll out cervical cancer vaccination

Research Update: The long struggle to tame malaria and HIV

The Exorbitant Cost of Missed Immunisation
This supplement is made possible by the generous support from the International Centre for Journalists and the Ministry of Health Uganda.
Three years ago, I attended the Pacific Health Summit conference in Seattle with the theme vaccines equity. It was attended by researchers, scientists, policy makers, vaccine manufacturers, industry players and politicians. The goal was to encourage collaboration among all these players for vaccines equity. Participants widely agreed that while countries have a duty to provide infrastructure for delivering vaccines to people, scientists have to explore different vaccine products and their packaging so that more people get vaccines that save lives and improve health.

Statistics mentioned at the conference showed that progress had been made, but more was still needed: 20 per cent of the world’s children still do not have access to vaccines. Meanwhile, as the ebola epidemic in West Africa shows, more research is needed to develop vaccines of particular importance to Africa.

The conference was echoing in my mind when I started discussing with my team the next theme for this, the seventh issue, of the health Digest. The result is now here for you to read. The Digest has come a long way. Even though our journey seems to be getting more difficult because of our limited funding, it is getting exciting because we are now expanding our coverage. In this edition we have writers from Cameroon, Rwanda and Sierra Leone.

Our goal in this issue is to contribute to the effort to ensure that every child in the world gets access to life-saving vaccines. To that end, we explore issues like innovative approaches to increase immunization coverage through outreach, philanthropy (rotary) help, community-built solutions, and efforts to improve the health system.

We cover the ups and downs in scientific vaccine research, the critical need for improved health infrastructure, strategic successes and the disheartening fact that some cults and parents either do not want or for some other reason fail to get children vaccinated.

And we also talk about exiting news of rolling out new vaccines in some countries. For instance, Uganda, next year will start rolling out the Human Papilloma Virus Vaccine. In 2013, it successfully introduced pneumococcal vaccine countrywide, and is expected to introduce a Rotavirus vaccine in 2016.

We try to explain the funding mechanism for vaccines and how the private sector can play a role. Although traditionally immunisation has been largely financed by governments with assistance of the World Health organisation and UNICEF.

We thank the International Centre for Journalists for paying our contributors. We are also grateful for the wise counsel of Dr. Robert Mayanja, the program manager, Uganda National Expanded Programme for Immunisation (UNEP) at the Ministry of Health in Uganda and Mr. Tabley Bakyaita Basajjatebadiba, a senior health educator, also at the Ministry as well as the WHO team.

Enjoy this issue

Esther Nakkazi
(President Health Journalists Network in Uganda)
The desired level of protection of a vaccine is usually 80 to 90 percent. But scientists say this isn’t enough to control some diseases.

ECONOMICS OF VACCINES
To date, vaccines reach at least 80 percent of the world’s children, a rate that has held steady for many years. But scientists say this isn’t enough to control some diseases.

The World Health Organisation estimated in a 2013 report that 22.6 million infants worldwide are still not getting basic vaccines, while many more fail to finish the schedule or ‘drop out’ and are incompletely vaccinated.

WHO recommends that vaccine coverage should be above 90 per cent of the target population to protect individuals and reduce disease transmission.

Vaccination has economic as well as health benefits. For instance, if vaccines are administered to up to 90 per cent of children in 73 countries eligible for aid from the GAVI Alliance, a public-private global health partnership, lives of about 6.4 million children under age five would be saved. The cost would be $231 million. An example of a vaccine-preventable disease is pneumonia, which is the largest source of childhood deaths globally. It causes 42 per cent of the 6.4 million children’s deaths that could be averted.

The GAVI Alliance was created in 1999 with the aim of addressing the gross inequality in access to new and underutilized vaccines. It aims to achieve the 90 per cent vaccination rate during the ‘Decade of Vaccines (2011-2020) period.

GAVI subsidises introduction of a range of new and underutilized vaccines, and offers financial support to strengthen immunization services and health systems. Governments, WHO and UNICEF also support immunisation.
monitoring technology exists to help ensure vaccine potancy, such as electronic temperature recorders, that indicate exposures below 0°C or above 10°C, and vaccine vial monitors.

Health worker competence is paramount for safe administration of the right vaccine to the right person, at the right time, and in the right manner. Maintaining the curricula in nursing, midwifery, and medical schools is, therefore, essential.

**VACCINES ADMINISTRATION**

Most vaccines are first given in infancy, but national vaccination schedules vary depending on the local epidemiology (determinants) of the disease, the vaccine products used, and the health contact opportunities. However, many countries now have national ‘immunization weeks’ or ‘child health days’ to raise public awareness and mobilize communities for routine or supplementary immunization services. Since 2012, the last week of April has been designated by WHO as ‘World Immunization Week’.

In Uganda and other developing countries, immunizations are increasingly packaged with other preventive health measures, such as provision of vitamin A supplements or insecticide-treated bed-nets (for malaria prevention), antenatal care or family planning services for women, and deworming tablets for school children.

After vaccines are administered, officials must engage in extensive surveillance and monitoring. WHO lists the diseases that must be reported to it, but countries also maintain their own lists of diseases requiring notification.

High-quality surveillance helps to detect cases and outbreaks early, identify populations at risk, and monitor vaccine impact. Typical adverse events following immunization (AEFI) include redness, itching or soreness at point of injection; otherwise, severe reactions following immunization are extremely rare.

As new products and technologies in vaccines arise, further quality assurance and stringent regulation will become even more important. Production costs are also likely to continue to rise, making affordability of vaccines for poorer countries even more challenging, according to the WHO.

However, vaccines and immunization must remain the pathway for primary health care and the key to delivering the benefits of science to prevent unnecessary illness and death around the world.

Ester Nakakazi is a freelance science journalist. She is also the Executive Editor of The Health Digest and founder of the Health Journalists Network in Uganda (HEJNU).

**Ebola: Is developing a vaccine the answer?**

By Kema Cham in Sierra Leone

When Salieu Sesay accompanied his breastfeeding wife to Princess Christian Maternity hospital (PCMH) in Freetown recently, they were turned away. There was no doctor to attend to her. The Sesays should count themselves lucky. Many others have had even worse experiences. Shola Margai, a pregnant woman, went to PCMH, the premier centre for maternity care in Sierra Leone, with bleeding after an accident. The sight of blood left nurses convinced that she had Ebola. She was locked up in isolation where she bled to death. A test for the virus later turned out negative.

Abu Benjamin Tarawallie, who lost both his father and stepfather to Ebola, says his stepfather, Fatmata, was taken to Rokupa Government hospital in Freetown when she fell sick.

She was there for about two days, and never got treatment. Instead, the matron would go to her ward every now and then to spray it, Abu says. “She was sprayed with chlorine while she lay on the floor in agony, until she died,” Tarawallie narrates.

Such sad stories abound across Sierra Leone, where more than two million people have been quarantined as the deadly virus invades more districts. They are isolated in five districts with no movement in or out, except for essential services providers.

The crisis has captured the world’s attention, and led to, among other things, calls for accelerated development of a vaccine to combat Ebola. But that probably is no answer, at least not for the near future.

Scientists say for all their effectiveness in eliminating many diseases, vaccines are no substitute for building strong health systems. And vaccines cannot be used in outbreaks.

The Ebola crisis, besides demonstrating the inadequacy of health systems, is actually weakening them further such as in Sierra Leone. Where relatively strong health systems exist, Ebola has been easily contained.

Health workers have been the most vulnerable to the disease, which has claimed thousands of lives in Sierra Leone, Liberia and Guinea. According to the World Health Organization (WHO), 373 health workers had succumbed to it in the three countries by mid-October 2014.

As of October 19, Ebola had infected almost 10,000 people in the three countries and killed around 5,000 of them, according to WHO estimates. Consequently, health care has crumbled across the country with people terrified to visit hospitals, which are themselves wary of treating those who summon enough courage to show up.

The Ebola epidemic began in Guinea in December 2013. Sierra Leone recorded its first case on May 25, 2014 but today it is second to Liberia as the hardest-hit.

In all three countries, which share extensive borders, denial and superstition have convived to fuel the spread of the virus with devastating loss of life and economic repercussions. Limited available laboratories to match up with demand means suspected Ebola patients like Fatmata die before their test results are out.

Contact tracing, which is fundamental for a disease so highly contagious, is nearly impossible. Tarawallie’s family has called the 177 emergency toll-free line for Ebola over a dozen times so that they can be placed under quarantine. There has been no response.

The department responsible to coordinate burials is overwhelmed; so, corpses spend days waiting for approval for burial, increasing the risk of transmission.

**PROSPECT FOR A VACCINE**

There is no known cure yet for the Ebola virus, whose symptoms manifest between two and 21 days after exposure. The conventional management of this disease, is the patient’s immune system, good supportive clinical care, avoidance of bodily touch with an infected person or dead body and protective burial.

Scientists think Ebola survivors may develop antibodies that may be effective for at least 10 years.

Marie-Paul Kieny, WHO assistant-director general for Health Systems and Innovation, says phase I trials of two vaccine candidates have started, and as many as five additional vaccines could begin testing by 2015.
A woman being consoled after losing a family member to the Ebola disease

“With limited resources, our focus now is to break the chain of transmission,” says Health Minister Dr Abubakarr Fofana.

One parliamentarian went further, saying Sierra Leoneans couldn’t be used as “guinea pigs”. That was in response to news that Canada had offered up to 1,000 doses of its experimental vaccine.

The focus, argues former WHO epidemiologist, Ugandan Dr. William Mbabazi, should be getting enough healthcare workers in the field, equipping them with protective gear, and then tracking infected people so that their contacts can be closely monitored and put in isolation if they contract the disease. Mbabazi currently works for the American Red Cross in Nairobi.

But health workers, key to this response, appear most disillusioned with the governments’ handling of the outbreak, as many of their local and foreign colleagues have succumbed to Ebola.

PROVEN INTERVENTIONS

Given these complexities, many – including Sierra Leone’s government – believe focusing on vaccine now could be an unproductive distraction.

“With limited resources, our focus now is to break the chain of transmission,” says Health Minister Dr Abubakarr Fofana. He was later quoted saying that experimental drugs/vaccines had “not been tested and are unreliable.”

Professor Dyewale Tomori, president, Nigerian Academy of Science, says it doesn’t make sense that a country that relied on international aid to procure protective equipment such as gloves for its health workers “can be talking about procuring an Ebola vaccine.”

The solution, he says, lies on education and deployment of a regular disease surveillance and response system. Another virologist, Dr. Julius Lutwama of Uganda, says people must be aware of the disease and how to seek medical attention as quickly as possible and avoid spreading it.

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The most prominent Ebola vaccines are the NIAID/GSK, developed by the US National Institute of Allergy and Infectious Diseases (NIAID) and GlaxoSmithKline, and the VSV-EBOV (Vesicular Stomatitis Virus-Based Ebola vaccine) developed by the Canadian National Microbiology Laboratory.

However, all of these were only tested on animals by mid-October. According to WHO, the first phase II and III trials, to test efficacy as well as safety, are set to start in Liberia in December 2014 and in Sierra Leone in January 2015. The Sierra Leone trial will enroll at least 8,000 healthcare workers, and other staff like ambulance drivers, cleaners and burial workers.

The Liberia trial might include healthcare workers too. But there is no trial design yet for Guinea due to lack of infrastructure. Health workers are seen as key because they have direct contact with sick people. Although, some argue women and children are more vulnerable to the disease and should get priority. But at the moment, it’s hard to prioritise. Besides, no one is sure of who will pay for the vaccines.

Another challenge is the evasive nature of the virus. A study in Sierra Leone, released in August, showed it had mutated 300 times since May. Mutation, the change in the chemical structure, is common among viruses, and this high rate for Ebola makes it even more dangerous.

Even survivors of Ebola, who are believed to be immune from re-infection in the short term, could become vulnerable again because of mutation.

A body awaiting removal from a Red Cross treatment center in Kenema
“We give them porridge wherever they come for immunization,” says Immy Julie Musoke, the club service director with Rotaract Club of Kampala South as she looks at a swarm of children enjoying the thick drink.

This day, the porridge attracts about 30 children at Sekiwunga in Kitiende. They will also be immunised. Each child comes with a cup. Jane Acilo, the president of Kampala South Rotary Club, says that on the third Saturday of every month, about 25 Rotarians meet at Hotel Africana and embark on the one-hour ride from Kampala to Sekiwunga to oversee the immunization exercise. “When we started out a year ago, the awareness about immunization in the area increased immensely.”

Two health workers come out for the outreach from two health centres. Rotary has contributed a lot because before, the children had to travel for long to access vaccination; some gave up. But since Rotary partnered with our health centres, we come to the children,” says, Juliet Kutesa, an immunisation service director with Rotaract Club of Kampala South.

“We work with government officials to build trust, and reach more children with the vaccine. We provide health care and we engage celebrity ambassadors at the local level to talk about the benefits of immunizing children against polio and other immunisable diseases,” she says. Dr Pandak says a polio-free Africa is within reach - perhaps by the end of this year. “With polio, only Nigeria has not stopped the virus. Uganda did. There were only a few cases in Cameroon, Equatorial Guinea and just one case of polio this year in Ethiopia.”

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Infrastructure

Pandak attributes the 99 per cent reduction since 1985 to success in getting infrastructure in place, training health workers, creating a cold chain system[temperature-controlled supply chain used to maintain optimal conditions] to transport vaccines from one point to another, and development of an ideal surveillance system.

“Those assets can be transferred to other health initiatives such as routine immunization so that we can build on what was accomplished in polio.” Dr Tunji Funsho, the National PolioPlus chair for Nigeria, agrees that Rotary has been investing a lot in many countries to increase immunisation incidence.

“The National PolioPlus campaign has contributed by supporting the setting up of more than 150 health camps. That has been a game-changer in bringing families out for IPDs [Immunization Plus days],” he says, noting that they even used inducements such as biscuits, soaps, noodles and whistles to encourage people to come.

“We recently provided 350 megaphones for distribution at ward level to ensure the community is mobilised to come out for immunisation,” he added. At Sekiwunga in Kampala, the children are thrown an early Christmas party on the third Saturday of December. Despite the goodies, some challenges remain. Some community members do not bring their children. The reason usually is that they have to tend to their gardens.

In countries where security is a problem such as Somalia and Nigeria, it can be even more difficult to reach children who need immunization. “Sometimes it’s hard to provide security to healthcare workers to enable them immunize children and for the parents to feel safe,” Dr. Pandak says.

Misinformation about vaccination is also a thorn though Dr Tungi says he believes the problem is being countered with effective social mobilization efforts, especially those done by Rotary clubs. “We have an important voice because we are voters in these countries. We are constituents, and government likes to respond to constituents.” Rotary members serve on Uganda’s National Interagency Coordinating Committee for Immunisation chaired by Dr Jane Ruth Aceng, the director general of Health Services, which includes Rotary members.

Basajjatebadiba says of this committee: “Our main role is fundraising, advocacy with donor governments and polio-high-risk countries.” Dr Sabrina Kitaka, a paediatrician, is also enthusiastic about Rotary. “Currently, I’m working with two Rotary clubs of Kiwatule and Kololo to promote the human papillomavirus vaccine for young girls and adults,” she says. “For me, this is a unique opportunity. The human papillomavirus causes cervical cancer.”

Partnerships

Dr Pandak stresses the importance of partnerships in promoting vaccination. “For example, UNICEF takes the lead on communication about polio, WHO provides the technical lead to support different ministries of Health in Africa, and implement strategies for polio eradication while Rotary gives the community face to effect the same.”

Multinational corporations including telecoms are being encouraged to join in. However, Basajjatebadiba notes that Rotary doesn’t approach companies dealing in tobacco and soda products because of health issues. Bryan Mbasa, MTN’s manager for Corporate Social Responsibility, says MTN has not been actively involved in working on immunization, but they have it in plan. “We are working on a project where we intend to get a mobile clinic. Once it comes in and we launch it, we’ll definitely include immunisation amongst other healthcare concerns.”

Mbasa says mobile clinics will be a bus travelling to different areas in the country, will start next year, 2015. Meanwhile, although Rotary officials acknowledge that government is indispensable to vaccination efforts, making immunization a higher priority is key.

The Ugandan government “needs to pull up their socks a bit more,” says Aceng. “They offer all these free drugs and free immunization, but most communities do not know that these drugs exist or where to access them.” Rotary International has a fundraising campaign mainly contributed to by the Bill and Melinda Gates Foundation.

“Rotary has committed more than $1.3 billion to the polio vaccination effort for more than two billion children in 122 countries, but globally we have a funding gap of about $600 million dollars. And, we have to operationalize commitments that were made, of about $3.1billion,” says Pandak. To finish the job, Dr Pandak says, $5.5 billion will be needed by 2018. Dr Tungi adds that success requires a “continued and consistent commitment” by governments, partners, traditional leaders and religious leaders, ensuring that there is no funding gap and curbing insurgencies will get the job done.

And Rotary is a big part of that effort. “If Rotary is committed to supporting a project, they do it with one heart and it really, really works,” concludes Dr Kitaka.

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Florence Nalugyima is an impassioned science, health and environment journalist working with NTV Uganda.

Rotary clubs have been pushing vaccines worldwide since 1979, says Dr Carol Pandak, the director of Rotary’s PolioPlus Programme based in Washington DC.

“We work with government officials to build trust, and reach more children with the vaccine. We provide health care and we engage celebrity ambassadors at the local level to talk about the benefits of immunizing children against polio and other immunisable diseases,” she says. Dr Pandak says a polio-free Africa is within reach - perhaps by the end of this year. “With polio, only Nigeria has not stopped the virus. Uganda did. There were only a few cases in Cameroon, Equatorial Guinea and just one case of polio this year in Ethiopia.”

**Health Digest**
The success of mass vaccination campaigns has the support of many players; politicians, physicians, the general public, media and in Uganda particularly, the Village Health Teams (VHTs).

A lot rests on these people to mobilise the population to take up services. Programme managers must be able to advocate and raise awareness, manage rumours and engage stakeholders.

In Uganda, for instance, for the last two campaigns, the VHT members played a key role in mobilising the population.

VHTs are members of a community who are chosen by the community or organisations to provide basic health and medical care to their community. Other members for this type of health care provider elsewhere include village health worker, community health aide, community health promoter, and lay health advisor.

They can be trained to follow up on clients who do not return for second or third doses, newborns who have not begun their immunisation, organise the community during an immunisation session and to distribute written information.

Planning starts with a census, says Dr. Robert Mayanja, the program manager, Uganda National Expanded Programme for Immunisation (UNEPI). He says the VHTs go house-to-house counting and registering the number of infants below five years in each household who are the target for the campaign.

This is done throughout the country and the data, when received at the ministry of Health, is used for planning in terms of vaccine doses and necessary logistics.

When it comes to the vaccination exercise, it is the same VHT members who did the registration that now guide the health workers to households with immunisable children.

This, according to Mayanja, reduces on time wasting by avoiding households that may not have children who need to be vaccinated.

Vaccines Delivery

Currently, the ministry of Health through UNEPI and partners UNESCO, WHO and others have set a three-day mass vaccination campaign scheduled for December 6-8, 2014.

Andrew Bakainaga, the World Health Organisation Vaccines and Immunisation country coordinator, says that social mobilisation is so critical to the success of the campaign.

“You can have all the vaccines, the human resources, the logistics, all well-coordinated but the whole campaign becomes meaningless if people do not respond to the call,” Dr Bakainaga explains.

Key to a vaccination campaign are committees to do surveillance, social and resource mobilisation as well as the national coordinating committee. They all get together and collate up with a plan to reach the target population.

In Uganda for instance, during campaigns, the vaccines are funded and procured by UNICEF. But for routine vaccines, the government of Uganda procures them through UNICEF, while the recently-introduced ones such as the pneumococcal conjugate vaccine are funded by the GAVI Alliance.

Initially, vaccine management committees forecast the vaccines required for a given year basing on the target population estimates, previous vaccine consumption and size of previous immunisation sessions.

“If for example, we are estimating 1.7 million babies in a given year, the committee will recommend for the procurement of three times the number of doses for that particular vaccine,” says Mayanja.

He adds that the excess caters for wastage, or acts as buffer stock in case of any unforeseen problems.

Usually a mix of immunisation strategies; fixed site and outreach, campaigns provide the optimal balance to achieve disease control targets and strengthen health systems.

Routine infant vaccination is the primary building block for control of vaccine preventable diseases; coverage well above 90 per cent (proportion of the target population vaccinated) protects individuals and reduces disease transmission.

Most vaccines are first given in infancy and national vaccination schedules vary depending on the local epidemiology of the disease, the vaccine products used, and the health contact opportunities.

WHO provides up-to-date recommendations on the number of doses, optimal timing, and interval between doses to assist countries in determining the immunisation schedule appropriate for their context.

Vaccines in Uganda are imported on a quarterly basis. When they arrive in the country, National Medical Stores (NMS) takes over storage and distribution to every district, from where the district health officer takes over and oversees the distribution of the vaccines to health facilities.

On the whole, planning, forecasting, procurement and distribution up to the district level, have no challenges – at least according to the WHO Vaccines country coordinator. They manifest at the district level, but beginning with the lack of cold chain technicians and district logistics.

According to their nature, vaccines can only survive under temperature conditions specified by the manufacturers. The cold chain system is, therefore, important for maintaining the vaccines under the necessary conditions so as to ensure their potency. Vaccine potency once lost cannot be regained even if they are later stored at the right temperature.

The cold chain is a system of storage and distribution of vaccines at specified temperatures from the manufacturer to the recipient, where it’s administered in a potent state. The system involves personnel, equipment, vaccines, supplies and procedures. In Uganda vaccines are stored at the Central Vaccine Store (CVS), the district vaccine stores (DVS), health sub-district stores (HSD) and the health unit.

“We still have big gaps, in our cold chain. Some fridges are not there, others are too old and we need to address these challenges at the district level,” Bakainaga explains.

Other challenges come in delivery from district to health facilities. Currently, the NMS is not paid to do last-mile delivery but, instead, the...
A handful of dissenters still oppose vaccinations

By David Mafabi

Vaccines are almost universally seen as one of the greatest achievements in science in the battle against disease, but there are still skeptics, such as members of a cult in eastern Uganda.

Followers of the Injiri cult (666), say the Bible forbids them from taking their children for vaccination and other government initiatives like elections.

Paul Wozaba, a follower of the Injiri cult, based in Mbale, eastern Uganda, says that apart from being against biblical teachings, some childhood vaccines are allegedly linked to autism, food allergies, cancer, infertility and they are on the Antichrist agenda.

In one of his sermons that I attended, he warned his community to stay away from foreign-funded programmes like immunisation, education, identity card registration and the census.

“I must tell you, my brothers and sisters, that finding a cure for an epidemic before its outbreak is not allowed in Injiri and biblically evil vaccines are made from animals not supposed to be eaten by man,” said Wozaba.

He quotes the book of Deuteronomy 14:7 in the Bible that forbids eating of some animals.

The cult’s teachings are so effective that during the 2013 polio immunization campaign, over 20,000 parents were reported to have refused to participate.

Apparently, this does not only happen in developing countries like Uganda. In 2006, fuelled by a now-discredited claim of a link between the measles-mumps-rubella vaccine (MMR) and autism, the UK experienced its largest measles outbreak in 20 years and the first measles-related death in 14 years.

Groups of populations in Nigeria and Pakistan refused the vaccines and in some cases killed vaccinators. Such events have also been the cause of the re-introduction of the wild poliovirus into countries which had been free for this disease for several years.

But Rev Paul Namonyo of Church of Uganda, Mbale cathedral, says the decision to immunise can’t be reached by logical deduction from biblical teachings; Christians have to use their wisdom from God.

Prof Emilio Ovuga of Gulu University and an expert at mental health says vaccination is key to public health and it is recommended by the World Health Organisation because of its effectiveness in disease prevention.

“Child survival is dependent on several factors including high vaccination coverage. It’s key because prevention is better than treatment,” said Prof Ovuga.

Dr Muhammed Mulongo of Tropical health centre in Mbale says Uganda’s young population should be protected through vaccination of all children.

He said that with cults like Injiri and a combination of other factors; remote location, weak health services, lack of education, and conflict can prevent children from immunisation.

Tabley Bakuya Basajjatibadiba, a senior health educator at the ministry of Health, says they are trying to dispel the untruths about vaccines because they are next to clean water and sanitation as powerful public health tools.

He also said the ministry of Health may use ‘some reasonable force’ such as police to ensure that everyone is vaccinated in November (2014).

Dr John Baptist Waniaye, the Mbale District Health Officer, says it’s important to bring all advocates, educators and to counter rumours and misconceptions.

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arrangement is to deliver at the district. Once the vaccines are under the district jurisdiction, the authorities at the district – usually the District Health Officer – draw a schedule of delivery to all the health facilities.

However, most districts are not equipped with cold chain facilities and vehicles to deliver the vaccines and, therefore, wait for facilities to collect them. Dr Mayanja also says that maintaining the fridges remains costly since most facilities in rural areas have no electricity.

“Majority of them use gas, we also installed solar panels and bought solar fridges, but that has not solved the problem as people have stolen both gas cylinders and solar panels, making it more difficult to have vaccines at facilities at all levels,” he explains.

This further strains the immunisation services, especially if the facility with no cold chain has to store the vaccines at another facility and cannot pick them daily due to transport challenges.

At the end of the day, where immunisation should be done daily, as stipulated in the policy, it is done in a week. This means outreaches and adverse events following immunisation (AEFIs), which are medical occurrences observed within four weeks following immunisation and believed to be caused by vaccination, become difficult.

Dr. Bakainaga says when it come to gas, which is used to run over 80 per cent of all the immunisation cold chains, its delivery by NMS is wanting.

“Gas, runs out in many health facilities and the lower-level health facilities are usually unable to buy replacement cylinders because of both policy restrictions on gas purchases and lack of operations cash,” he says.

There are also no stringent adherences to population and target undertakings. “Facilities order in a very disproportionate manner, which may drain stocks at the national level or lead a facility to have more than they need, yet another has shortage."

HUMAN RESOURCE:
Dr William Mbabazi, the Health/Measles delegate, International Response and Programmes at the American Red Cross based in Nairobi, says that Uganda has low numbers of skilled human resources for health.

Most of the skilled health workers are engaged in clinical care and hardly engage in primary health care services like immunization, he says. Yet according to WHO, health worker competence is paramount to safe administration of the right vaccine to the right person, at the right time, and in the right manner.

“If you visited any regional referral hospital, you would most likely find that immunization services are managed by nursing aides. Even where nurses are managing the immunization services, you will never find a medical officer in any health service facility providing technical support to immunization services,” he says.

This, he says coupled with poor human resources for health management remains a big problem for those workers in service. Reports of missed salaries, nurses with higher qualifications recruited and paid for lower qualifications they had at the time of entry into the service, absenteeism, at the end of the day affect primary health care programmes such as immunisation.

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Health Digest
A door-to-door polio vaccination strategy that takes health officials directly to people is paying off in Cameroon, judging from data released by the government. The ‘Polio Eradication and Endgame Strategic Plan’, a door-to-door exercise, was first introduced in Cameroon and other polio-endemic countries in 2008 by the World Health Organization (WHO).

According to Joelle Mandeng, chief of communication at the Expanded Programme on Immunization (EPI) head office in Yaounde, this strategy is only adapted for polio because the Oral Polio Vaccine (OPV) is easy to administer. The trivalent live attenuated OPV, widely used since the early 1960s, induces mucosal immunity, and it is of low cost. So, it is ideal for lower-income countries.

But most industrialized countries use inactivated polio vaccine (IPV), which is more costly. However, to achieve global polio eradication, vaccination with OPV will have to cease, says WHO.

In Cameroon, the door-to-door exercise is a community strategy; involving many people, mostly volunteers trained as social mobilisers to raise awareness and others as vaccinators. Traditional rulers and other leaders are also involved since they play a major role in encouraging their subjects to accept the vaccines and are better placed to identify suspicious cases of the disease and report to the nearest health establishment.

With polio being more common in infants and young children, the campaign targets only children from zero to five years and of up to ten years of age in regions with low vaccination coverage. A post-vaccination survey carried out in Cameroon shows that 95 per cent of the target population has been vaccinated.

According to WHO, the number of cases of polio in the world has been reduced by over 99 per cent. In 2014, only three countries, Afghanistan, Nigeria and Pakistan remain polio-endemic, down from more than 125 countries in 1988.

Calvin Tonga, EPI data manager in the littoral region, says this strategy saves parents' time and money and gives room for mass sensitization through the media and mobile social mobilizers. However, despite the positive results in Cameroon, the strategy doesn’t seem to be very effective in other countries, especially neighbouring Nigeria, which still accounts for 79 per cent of world’s polio cases according to the WHO.

Violent conflicts led to the suspension of vaccination for over eight months in the northern states of Nigeria last year, but religious and cultural inhibitions also still prevail. Some people view the campaign as a Western plot to sterilize Africans or simply believe that the body is sacred and should be healed only by God or natural means.

With cases still identified in Central African countries like Equatorial Guinea, Chad and the Democratic Republic of Congo, it’s clear that the indigenous Nigerian wild poliovirus (WPV) is still circulating.

So, Cameroon’s health authorities are leaving no stone unturned. Eight National Immunization Days Against Polio have been organized with a rising number of children being touched. Polio is a highly-contagious disease that is easily spread from contact with the stool of an infected person.

"With porous borders, the best thing to do is to vaccinate every child. Even those who have already been vaccinated are advised to repeat the doses because taking the vaccine several times is not harmful but, rather, builds their immunity," Tonga explains.

In September 2014, a synchronized vaccination campaign carried out in Cameroon and other eight neighbouring African countries brought great relief as it was geared at stopping the continental spread of the WPV.

Meanwhile, the oral polio vaccine is equally made available to adults at the price of FCFA 1,000 (about $2) and all travellers from or into Cameroon are obliged to take the vaccine, which experts say can protect the human body for at least ten years. The polio vaccine is also provided in fixed public health facilities to enable parents with missed-out children to catch up. In areas with security issues, vaccinators are accompanied to the field by security forces.

With support from the WHO, IMF, UNICEF, Rotary International, Lions Club and Plan Cameroon, the Polio Eradication and Endgame Strategic Plan’, a door-to-door exercise, was first introduced in Cameroon and other polio-endemic countries in 2008 by the World Health Organization (WHO).
among other partners, the anti-polio campaign is likely to continue for several more months as Cameroon seeks to play its part in the global effort of eradicating polio from the Earth by 2018. However, mobile health care has always proved to be the most effective strategy in Cameroon, says Tonga.

For instance, a mobile clinic project introduced by Plan International, an international development organisation promoting the rights of children, in 2011 has increased access to health care for children, new mothers and pregnant women. The project, which supports several campaigns, including mother and child nutritional weeks organized twice a year by the government, has led to the vaccination of more than 200,000 children in 134 health areas and the training of more than 150 community health workers.

Tonga says these outreach services are more effective because they not only raise awareness but offer health care to remote and rural areas. However, they are very costly and can only be implemented with the huge financial support of partners.

From 50 per cent in 2004 to 88.5 per cent in 2013, Cameroon’s vaccination coverage is no doubt progressing. But Mandeng believes that if the country had a law obliging vaccination as compulsory and more funds were allocated for health communication, then the results would be much better.

“We decided to target primary-four girls who we estimate are 10 years old because the vaccine works best before the girls get their first sexual contact,” says Dr Gerald Katungi head of Non-Communicable Diseases programme at the ministry of Health.

Mugirwa is one of the many in Uganda, ignorant about cancer of the cervix. In April 2015, the ministry of Health, rolls out a countrywide mass vaccination campaign to protect young girls from acquiring the human papillomavirus, which causes cervical cancer.

“The nurse told her that her cancer was beyond treatable stage, and she would die.”

But hope turned to gloom. On one visit to town, Mugirwa tested positive for cancer of the cervix. The nurse told her that her cancer was beyond treatable stage, and she would die.

“Tonga says these outreach services are more effective because they not only raise awareness but offer health care to remote and rural areas. However, they are very costly and can only be implemented with the huge financial support of partners. From 50 per cent in 2004 to 88.5 per cent in 2013, Cameroon’s vaccination coverage is no doubt progressing. But Mandeng believes that if the country had a law obliging vaccination as compulsory and more funds were allocated for health communication, then the results would be much better.”

By Shifa Mwesigye

In 2006, Perectus Mugirwa, 41, had reason to look to the future with hope. Vast oil deposits had been discovered in her home district, Hoima. Soon the road linking her home to Hoima town was upgraded to tarmac, making it easy for her to travel to town to buy goods or visit the bank and health centre.

But hope turned to gloom. On one visit to town, Mugirwa tested positive for cancer of the cervix. The nurse told her that her cancer was beyond treatable stage, and she would die.

“I had been taking local herbs to treat the pain in my abdomen,” says Mugirwa, who thought she had a urinary tract infection. “I was shocked when the nurse said I was going to die from cervical cancer. How did I get it?”

Mugirwa will not live long enough to enjoy the benefits of oil development. If she had got the life-saving human papillomavirus (HPV) vaccine, or early screening, she wouldn’t now be talking about a bleak future.

The ministry of Health estimates that the rollout will cost $13.9 million, which includes distribution costs. The GAVI Alliance (formerly Global Alliance for Vaccines and Immunisation) will fund about 90 per cent of this budget.

The cocktail of three doses costs $400 in developing countries. But Merck – the manufacturers of Gardasil HPV vaccine – offered to sell the vaccine to the GAVI Alliance for $5 per dose.

Most of the 57 countries that are eligible for GAVI Alliance support would contribute only $0.20 of the purchase price per dose, according to Nina Schwable, managing director of Policy and Performance at GAVI Alliance.

Yet treating cervical cancer in advanced stages is estimated to cost more than $20,000.

CERVICAL CANCER IN UGANDA

Every year, about 3,600 women in Uganda are diagnosed with cervical cancer and about 2,500 die of the disease. In Mulago hospital’s gynaecology ward, 60 per cent of beds are occupied by cervical cancer patients.

The ministry of Health in partnership with PATH (Programme for Appropriate Technology in Health) carried out a pilot vaccine campaign in 2007 to establish if the HPV vaccine is acceptable, its delivery models and the logistics for distribution. It targeted 10,000 girls in Ibanda and Nakasongola districts.

During the campaign, PATH research showed that in Uganda, the mother has the primary responsibility for vaccination decision for her girl child. But when vaccination found the girls at school, parents’ approval was not sought. It was also reported that parents were initially reluctant to have their daughters vaccinated because of ignorance. Some parents even quietly withheld their daughters during the first dose to observe what would happen to those who were vaccinated.

Parents and communities were concerned about the safety and side effects of the vaccine on future fertility of the young girls, bleeding, paralysis, swelling, and death. Other parents worried that the vaccine would accelerate girls’ sexual desires.

“There was a rumour that maybe the vaccine is a form of family planning. But we have documented evidence where it is being implemented and there is no science to relate it to family planning and the reproductive system of a girl,” said Katungi.

He says because of the success of past vaccination campaigns in eradicating diseases such as polio,
A leading Researcher Reflects on 12 years of HIV Research

Dr. HANNAH KIBUUKA has been involved in HIV research since 2003 when she joined the Makerere University Walter Reed Project (MUWRP). Before becoming an HIV researcher, Kibuuka was a practicing physician. MUWRP initially focused on HIV vaccine research, conducting trials and establishing capacity to conduct all phases of vaccine trials. Today, the project also supports the districts of Kayunga, Mukono and Buvuma to provide HIV care, treatment and prevention, with support from the PEPFAR [US President’s Emergency Plan for Aids Relief].

Ediris Kisambira spoke to Dr. Kibuuka about her work over the last 12 years and below are the excerpts:

What exactly are you doing currently as a project?

We continue to do vaccine trials; we have conducted mainly the earlier phases I and II where we bring in healthy individuals and give them an experimental HIV vaccine. We follow them up to see if their bodies have made an immune response, which could be protective. Currently, we have a vaccine trial though it’s in passive follow-up. Study participants are contacted every 9 months to see if they have any study-related problems so, it’s almost complete.

We also do studies that support HIV vaccine research – studies that can provide us with information that we can feed back into the vaccine-development process because you know as you develop vaccines, it is important to understand the interaction between the virus and the body and how the body reacts when someone gets infected. That information is critical because if we can understand how the body deals with the virus, then it can help us design better vaccines.

Any examples of studies that support HIV vaccine research?

Studies conducted in most-at-risk populations such as the fisher folks and commercial sex workers are such examples. There is a lot we learn from them. If participants are not infected at the beginning of a study and you follow them up and they continue not to be infected they are exposed, you can use that information to develop a vaccine that can help people not to get infected.

But you can also learn from those people who you follow and along the way they get infected. Because we know that the body controls the virus initially until one gets full-blown Aids. It means we can learn about initial interaction and how the body manages to control the virus.

If we are unable to get a vaccine that completely prevents HIV/Aids, but a vaccine that controls the infection would be useful, so, that information is critical.

How does research benefit the communities where it is carried out?

We have an obligation as researchers to ensure that people who participate in our trials have access to care and that the project works to the benefit of the community. We have, for example, partnered with Kayunga district, sought PEPFAR [US President’s Emergency Plan for Aids Relief] funding to provide care not only to our research participants but the wider community and now it is a big programme.

We built a training centre for circumcision, remodelled the laboratory and there is a benefit of giving knowledge to health workers, the general community, media, policymakers, etc.

How has local capacity been built in the HIV vaccine research field?

When we do research, we look broadly at building capacity. We have people who are trained; researchers, nurses, and doctors but we also have support structures like administration and logistics. That is very key because you have to get equipment, supplies and in a timely fashion.

We have a data department where we send all our data. We have a laboratory, a community outreach programme, the Community Advisory Board (CAB) whose members liaise with researchers and the community to help us understand issues in the communities as we conduct our research.

The answers we find help us to build a strong advocacy system but also a policy environment that can enhance future research; for example, the institutional review boards. As they review more protocols, their ability is enhanced.

Capacity is incremental and gradual and Uganda is one of those countries that conduct high-quality HIV vaccine research – not only our programme at MUWRP but also others.

Who do you collaborate with?

The project is a collaboration between Makerere University and the US Military HIV Research Programme which supports several sites in Africa; in Uganda, Kenya, Tanzania, Nigeria, Mozambique and Thailand.

Do we have Uganda or other Africa governments funding vaccine research?

Although the support may not be in monetary terms, governments provide an enabling environment for research. For example, The Ugandan government has established the UNCST [Uganda National Council for Science and Technology] and other regulators that approvals research and also guides researchers on how to do research is critical.

Uganda has also set up another body; the Uganda National Health Research Organization (UNHRRO) to regulate research in the health sector. African governments struggle with many things but I think, with time, they will come in with direct financing; however for now, they provide an enabling environment.

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VACCINE ROLLOUT

Uganda is now one of the 40 countries that have included HPV vaccine in their national vaccination schedules.

Bety Irwasi, the focal person on implementing HPV vaccine at UNEPI [Uganda National Expanded Programme on Immunisation], explains that there are 40 strains of HPV that infect the genital tract. Cervical cancer occurs most commonly among women in their 40s and 50s.

Six types of HPV account for about 85 per cent of cervical cancer cases worldwide. New vaccines against the two HPV types that account for 70 per cent of cervical cancer cases worldwide (types 16 and 18), will be available in Uganda. In clinical trials, the vaccines have proven at least 95 per cent effective in preventing persistent HPV infection and 100 per cent effective in preventing genital warts.

The injectable liquid vaccines are given in three doses at zero, one and six months’ interval; and are stored at a temperature of +2°C to +8°C. The doses at zero, one and six months’ interval; and are stored at a temperature of +2°C to +8°C. The HPV vaccine is safe and effective. Studies have shown no serious side effects. The most common side effect is soreness at the injection site.

Irwasi says the Uganda government is focusing on vaccination first and screening as the second intervention. Screening is where the cervix is checked for suspicious cancers. Once detected early, the lesions are burnt to stop the cancer from spreading.

“We are letting people down because we do not have the capacity and funding to screen every eligible woman. Every Member of Parliament is asking us to take screening outreaches to their communities,” Katungi says.

By July this year, 158,972 women were screened and 2,908 received treatment. Some 167 were referred to Mulago national referral hospital for advanced treatment.

Mugirwa is one of these but many rural women like her cannot afford the treatment, let alone the transport to Kampala. So, they stay in their village homes whiling the days towards their death.

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Shifa Mwesigye is a journalist and communication specialist based in Kampala.
Uganda’s paediatric HIV vaccine trial: Good methods but disappointing results

By Emmanuel Kajubu

Uganda was the site of the first paediatric HIV vaccine trial carried out in Africa. It was a phase I trial, done in 2004. Phase I trials look at safety and immune response in 20 or fewer participants, usually healthy adults.

The trial, just one small step in the long process of developing a vaccine, shows that developing a new vaccine can be an arduous task, and that success comes gradually, one small step at a time.

Scientists say it was a success, as none of the children who received it contracted the HIV virus. But, while that represented a significant step in the long process of developing a vaccine that would probably be more suitable for multiple strains. We hope these vaccines will be tested soon.

There are studies done to identify neutralizing antibodies that are useful in HIV because for quite some time the HIV/Aids research field focused on T-cell immunity. As we understand a vaccine that can elicit both antibody response and a cellular response (T-cell) is most ideal. Usually antibodies fight infection when it is still in the blood and the cellular response fights infection once it enters the body cells.

So, scientists are working to understand antibodies, which can neutralize the virus before it enters the cell and also how these can be generated during vaccine development.

Phillipa Musoke, who was the co-investigator of the research team and an associate professor in the department of Paediatrics at Makerere University, says the trial was conducted in Uganda because the investigators behind the trial were known experts in the area of prevention of HIV in children, citing the late Prof. Francis Miro.

Others were Dr. J Brooks Jackson and Laura Guay; the principal investigators from Johns Hopkins University School of Medicine, Dr. Clemensia Nakabujo and Dr. Kenneth Kintu, the study coordinator.

Uganda had also been doing adult vaccine studies; so, it was deemed sufficiently experienced and competent.

The two-year vaccine trial was conducted jointly by researchers from Makerere University and the Johns Hopkins University, USA.

Musoke says that with the high number of HIV-infected mothers, there was need to try out a vaccine that would enable infected mothers to breastfeed their babies.


“Prevention of postnatal paediatric HIV infection is now possible through use of ARV prophylaxis,” Musoke says.

The ALVAC-HIV-vCP1521 vaccine was safe and well tolerated in HIV-exposed infants when administered monthly in the first three months of life. Most reactions to the vaccine were mild.

But there is still no HIV paediatric vaccine yet despite ALVAC-HIV-vCP1521 trial’s safety. Why? Dr. Kenneth Kintu, the study coordinator of the trial, says: “Although the trial was safe, it did not show enough activation of immune response to HIV necessary for prevention of HIV infection.”

“It means that the vaccine may not be effective against HIV. Other vaccines of different makeup may need to be explored,” he says.

According to Kintu, it is also unlikely that the ALVAC-HIV-vCP1521 trial vaccine will be further investigated for prevention of mother-to-child transmission of HIV.

Dr. Kintu says that paediatric Aids vaccines are pertinent to the search for a general Aids vaccine. But for now, “It is hard to tell how close we are to a general vaccine. A breakthrough may happen in the near or far future.”

Vaccines are first carefully evaluated for effectiveness and potential harmful effects in vitro and in animals. If good results are obtained, phased clinical trials of increasingly larger size are performed to establish clinical tolerance and safety, quantify immune response, and demonstrate protective efficacy.

For instance; Phase 1 trials look at safety and immune response in 20 or fewer participants, usually healthy adults. These trials are meant to identify any common adverse reactions.

Phase 2 trials involving fifty to several hundred participants help determine the optimum vaccine composition to achieve adequate protection while ensuring safety.

Phase 3 trials, which are larger and involve thousands to tens of thousands of participants determine clinical efficacy for disease prevention, provide further safety information, and serve as the final gatekeepers before widespread use.

In general, such trials include a control group receiving a placebo in order to compare the occurrence of adverse events among vaccinated and unvaccinated individuals.

And when in production, each step of the production process is documented and validated. Confidence that vaccines are consistently safe and efficacious requires continual oversight by an independent and competent National Regulatory Authority (NRA).

In addition to sophisticated tests, vaccine regulation entails characterization of starting materials by supplier audits, cell banking, seed lot systems, compliance with the principles of good manufacturing practice, and independent release of vaccines on a lot-by-lot basis by NRAs.
Injectable vaccine could give polio its last gasp

By Racheal Ninsiima

Uganda plans to introduce an injectable polio vaccine (IPV) next June, in what it believes will be the end-game in efforts to eradicate polio by 2018. Health experts say introducing injectable polio vaccine, also called the Salk vaccine, into routine immunisation programmes will increase immunity and prevent vaccine-associated illness.

The oral polio vaccine (OPV) is credited with saving the lives of many Ugandans, mostly in children under age five, by preventing polio, an incurable viral disease that affects the brain and spinal cord and can cause permanent paralysis. But in some rare cases, the oral vaccine has been associated with causing paralysis.

IPV, however, according to the Global Polio Eradication Initiative (GPEI), is a better way to inoculate children against the disease as it contains inactivated (killed) poliovirus strains.

“It [IPV] could play a major role in completing the job of polio eradication once and for all, both from the remaining endemic reservoirs [where the indigenous wild poliovirus has never been eradicated] and specific outbreak settings [also called importation countries, where outbreaks come about because of travel into or outside the country], securing a polio-free world,” said Dr. Robert Mayanja, the programme manager, Uganda National Expanded Programme on Immunisation (UNEPI) at the Ministry of Health.

Only three indigenous wild poliovirus-endemic countries remain in the world; Afghanistan, Nigeria and Pakistan owing to their low immunisation coverage. Their poor coverage has been worsened by insecurity.

Dr. Mayanja added that IPV offers 100 per cent protection to children compared to 98 per cent from OPV, also called the Sabin vaccine.

IPV is administered to children at 14 weeks of age by an intramuscular injection, done by a trained health worker. In the near term, IPV will complement the OPV using the following immunisation schedule: at birth, administer (OPV); at six weeks (- OPV); 10 weeks (- OPV) and 14 weeks – both OPV and IPV. Eventually, OPV will be phased out completely.

ERADICATION

The shift from the oral to the injectable vaccine is a key part of the endgame in the fight against polio. In May 2013, the World Health Assembly endorsed the new Polio Eradication and Endgame Strategic Plan: 2013-2018, calling on countries to introduce at least one dose of IPV and begin the phased removal of OPV.

“The primary role of IPV will be to maintain immunity against type 2 poliovirus. A key component of this objective is the strengthening of routine immunisation systems, as high immunisation coverage is essential to achieving the goals of the polio endgame and long-term sustainability of polio eradication efforts,” said Dr Annet Kisakye, the World Health Organization (WHO) Uganda country adviser on the polio eradication initiative.

Worldwide, more than 60 countries have introduced IPV, including India, Nepal Philippines, USA and Germany. The initiative to introduce IPV worldwide is spearheaded by, among others, the World Health Organisation (WHO) and UNICEF.

A PERSISTENT DISEASE

Although Uganda has not reported any new case of polio since October 2010, Dr Mayanja says it is still considered to be one of the high-risk countries that can get a polio outbreak due to influx of refugees from Somalia, DRC and South Sudan. porous borders and suboptimal surveillance system and insecurity in those countries that leaves many children not immunised.

“High cross-border movements of populations coupled with previous history of importation of the wild poliovirus in Uganda could re-establish circulation of the virus in Uganda,” Mayanja said. There is a current wild polio outbreak affecting the Horn of Africa which, according to GPEI, began in Somalia in April 2013. The first imported polio case was detected in Ethiopia in August 2013 and so far, 10 cases have been confirmed, all in Dollo Zone, with the onset of the most recent case on January 5, 2014, according to a WHO statement in June 2014.

Uganda’s ministry of Health will in December 2014 conduct a house-to-house national polio campaign, targeting children less than five years throughout the country. Polio is contracted through eating food or drinking liquids contaminated with faecal material from an infected person. Symptoms include fever, tiredness, nausea, headache, nasal congestion, sore throat, cough, stiffness in the neck and back, and pain in the arms and legs.

Most people with polio don’t feel sick, and in few cases polio may cause permanent impairment of muscle functioning in the arms and legs or even death. Dr Kisakye says that in January 2015, after three years without a new case, GPEI will formally declare Uganda polio free.

The efforts to achieve this have been monumental with the development and implementation of the two-year revitalization plan, recruitment of over 7,000 health workers and reinstatement of the GAVI Alliance [formerly Global Alliance for Vaccines and Immunization] support to the country.

In September this year, the Health ministry announced new plans to enhance support to immunisation programmes. This will involve the procurement of over 800 fridges and 615 motorcycles for health centres III, improving the immunization data management system and training health workers in integrated disease surveillance and response.

PUNISHING MEASURES

During the announcement of the new GAVI Alliance monies, Dr Elisa Tumwesigye, minister of state for Health (General Duties), said the new immunisation bill, to ensure a legal framework for implementation of immunisation had been presented to Parliament.

Tumwesigye noted that when passed, the law would provide punishments, including a jail term, to parents who do not take their children for immunization.

“Parents are urged to ensure every child is taken for immunization, five times before their first birthday, i.e. at birth, one and half months, two and half months, three and half months and nine months.”

Nevertheless, although IPV is predicted to be the game changer in combating polio, it requires larger amounts and this makes it more costly than OPV. It costs $1 per dose instead of just a few cents for the oral vaccine.

Currently, Sanofi and GlaxoSmithKline are the primary producers of IPV and they sell it to UNICEF for more than $5 per dose.

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We all know how HIV has impacted Uganda: more than 30 years after the first cases were found in a Lake Victoria fishing community, AIDS has killed hundreds of thousands of Ugandans, orphaned millions of children and caused enormous suffering. Even now, more than 100,000 Ugandans become infected with HIV every year.

But there is another story about HIV in this country: Uganda has become a leader in efforts to learn about the virus, to prevent it from spreading and in working to ensure that people living with HIV receive the best treatment available.

Uganda is globally recognized for conducting research, which has led to important discoveries about how to prevent and treat HIV, including research on the prevention of transmission from mother to child and the research finding that male circumcision is an effective method for preventing new HIV infections.

But new infections are still occurring in Uganda and around the world, making it clear that many people are not accessing the available prevention methods and that new methods of HIV prevention are urgently needed. A safe and effective vaccine would be the best way to ultimately controlling the HIV epidemic.

From early on, Ugandan scientists working with international partners started preparations for future HIV vaccine research. Work with rural populations in Rakai and Masaka and with the Uganda military provided important information such as the incidence of HIV and virological and immunological data to inform vaccine design. A landmark in HIV vaccine research took place in 1999 when Africa’s first HIV vaccine clinical trial was launched in Uganda at the Joint Clinical Research Centre (JCRC). This was a small safety study involving 40 volunteers.

While the study found that the vaccine candidate was safe, it also demonstrated that it would likely not be effective in preventing HIV transmission. This study was most important in demonstrating that it was possible to conduct complicated HIV vaccine trials in developing countries such as Uganda.

Prior to this study, the conduct of sophisticated research was mostly limited to developed countries, with African researchers conducting observational studies and laboratories in Africa mostly engaged in collecting and shipping samples to the US or Europe for testing.

Now it is widely accepted that research needs to take place locally in order to be relevant and to address local problems and that it is more efficient and sustainable in the long run to conduct HIV vaccine research in populations that are most in need of a vaccine.

But this first HIV vaccine trial, in Africa, faced many challenges: massive public criticism; social, political, legal and ethical barriers; widespread fear about the risks of participation and a lack of comprehensive national guidelines to regulate this sort of research.

Now, fifteen years later, the concerted efforts of government, research organizations and civil society have ensured that clear HIV vaccine research guidelines are in place; that communities hosting HIV vaccine research are full partners in the research process; world-class research capacity has been established and Ugandan research teams are recognized as key players in the global efforts to develop an HIV vaccine.

Since 1999, more than ten HIV vaccine trials have been conducted by Ugandan research groups including the MRC/UVRI, a Uganda Research Unit on AIDS, the UVRI-IAVI, an HIV Vaccine Program, the Makerere University Walter Reed Program (MUWRP) and the Makerere University Johns Hopkins Program.

These studies are conducted in partnership with international organizations such as the International AIDS Vaccine Initiative, Johns Hopkins University, and the US Military HIV Research Program.

All of these studies are conducted according to the highest scientific and ethical standards with each study moving us closer to understanding what is needed in order to have an effective vaccine. But even with these major advances in understanding HIV, we still have not yet found a successful vaccine – but we must not give up the fight.

In Uganda, the HIV vaccine research efforts continue. Not only in planning for future HIV vaccine trials, but research teams are collecting essential information on the populations in Uganda that are most at risk of HIV like fisher folks, commercial sex workers etc. Not only does this help us to understand the people who will benefit the most from a vaccine, but this information can also inform the development of targeted strategies for effectively delivering HIV services to these communities. These other populations continue to contribute to research addressing important scientific challenges of developing a vaccine.

All HIV vaccine researchers are committed to ending the epidemic, to seeing a world without HIV and to sending this message: Until there is a vaccine, everyone needs to understand how HIV is transmitted, how HIV infection can be prevented; everyone must have access to the current available methods of HIV prevention and all people living with HIV must have access to life-saving treatment.

Professor Pontiano Kaleebu is the director of the Medical Research Council and the Uganda Virus Research Institute (MRC/UVRI).
Immunisation is among the most successful and cost effective public health interventions in reducing child deaths in under-one-year-old children. It has led to the global eradication of smallpox.

Globally, immunisation currently averts an estimated two to three million deaths from diphtheria, tetanus, whooping cough and measles every year in all age groups.

The primary goal of the ministry of Health through Uganda National Expanded Programme on Immunisation (UNEPI) is to ensure that all children under one year of age and women of child-bearing age are reached with high-quality and effective vaccines against the target vaccine-preventable diseases.

This is to be achieved through increasing access to immunization services; ensuring availability of potent, safe, and effective vaccines; increasing demand for immunization services; building capacity for delivery of immunization services, monitoring disease incidence, trends and programme performance.

The immunization programme is continuously expanding and more lifesaving vaccines will be added onto the routine immunisation services. Come 2015, the programme plans to roll out the human papillomavirus (HPV) vaccination to all the 112 districts of the country.

Currently, HPV vaccination services are being provided in 14 districts targeting the 10-year-old girls in and out of school. It is aimed at reducing cancer of the cervix in women. I, therefore, urge schools and parents in the 14 implementation districts to take their pupils to health facilities for vaccination.

In addition, all school administrations in primary and secondary schools should work with health facilities in their neighbourhood to have their pupils and students vaccinated against tetanus.

Immunization Coverage grows in Uganda

By Joel Namiganda

Uganda’s immunisation coverage has shot up from 52 per cent to 97 per cent in some regions for immunization against polio, tuberculosis, diphtheria, whooping cough, tetanus and measles.

This has been achieved after strategies implemented over a year ago that ensured adequate finances, timely procurement and delivery of vaccines systems through the National Medical Stores (NMS) and the recruitment of health workers, said Dr Jane Ruth Aceng, director general, Health Services.

According to Aceng, the mass recruitment of health workers for health centre Ills and IVs where immunisation services are mainly sought through lower health facilities, increased access and parents’ response to the call for immunisation. According to Mrs. Victoria Ssenkubuge, a midwife at Mulago hospital who actively participates in immunisation everyday, mothers are enthusiastic about having their children immunised because they want them to grow healthy.

On average, Ssenkubuge immunises 50 babies a day at Mulago. She explains that although some vaccines are paid for, such as the pneumococcal vaccine, that prevents pneumonia, the rest of the vaccines are given to children under age five, free of charge.

She, however, says a few mothers refuse to bring their children to be immunised because their husbands refuse them to and also basing on rumours from friends. For others, it is their cultural backgrounds that impede them.

“We usually sensitise them on the dangers and benefits of immunization,” says Ssenkubuge.

Joel Namiganda is an intern with The Health Journalists Network in Uganda which produces the Health Digest.
The High Cost of Missed Immunisation

By Anne Mugisa

Who could forget those eyes, sunken in the skull along with the cheeks? The child looked exhausted as her eyes rolled lazily upwards to look at me. She looked like her small frame had become a burden she could not carry.

Little Mary Kabasweka had come down with diarrhoea again. Her semi-literate young mother, Christina Tibagwa, looked on helplessly, occasionally peering out of their rented two-roomed tenement in Kulambiro, Kisaasi, a mixed-income neighbourhood in Kampala.

She had no money to take Mary to hospital, she said. A neighbour was helping out with homemade oral rehydration salts (ORS); boiled water, sugar and salt solution. Hooked to an oxygen mask about a kilometre away and salt solution.

In its World Health Rankings report published in 2011, WHO, indicated that diarrhoea deaths in Uganda exceeded 37,600 or about 10 per cent of the country’s total deaths. More than a third of those who died were children under five.

Pneumonia deaths were even higher, reaching almost 39,000. Two-thirds were children under five years. Uganda’s Annual Health Sector Performance Report for the financial year 2012/13 indicates not much has changed.

Many more people suffer these two diseases but survive. Between 2008 and 2013, the number of people treated for diarrhoea as outpatients jumped from 965,000 to 1.3 million. During the same period, pneumonia outpatients rose from about 888,000 to more than one million. More than half of these were children under age one.

The consequences are even greater than the official numbers indicate, because even if children survive diarrhoea and pneumonia, these diseases make them vulnerable to other illnesses.

For example, doctors Robert Mayanja and Moses Walakira explained that children who survive recurrent diarrhoea get malnourished. This is because the disease robs the body of food nutrients, resulting in conditions like anaemia. In such a condition, malaria could kill a child very fast.

Chronic malnutrition also affects a child's cognitive development. Such children cannot learn well in school, explained Dr. Robert Mayanja, the programme manager, Uganda National Expanded Programme on Immunisation (UNEPI).

Besides causing human suffering, diarrhoea and pneumonia lead to substantial economic losses, not only in lost manpower and man-hours, but also in the high cost of treating individuals who fall sick because preventive measures like vaccination were missed.

For example, a Water and Sanitation Programme (WSP) 2012 study report, ‘Economic Impacts of Poor Sanitation in Africa’, indicated that Uganda loses $147 million annually due to premature diarrhoea deaths. It also said another $1.1 million is lost yearly due to productivity losses arising from the sickness. This includes the time spent caring for under-five children with diarrhoea.

The minister of state for Health, General Duties, Dr. Elioda Tumwesigye, says Shs 389 billion is spent annually on health care for diarrhoeal diseases and their consequences. This translates to over Shs 299,230 per-person on treatment alone.

In contrast, a full vaccination schedule of two doses against diarrhoea would cost $5.10 (about Shs 13,240) per child. Of this, Uganda will pay US 20 cents, and GAVI Alliance funds the rest.

The ministry says it has not computed the amount specifically spent on the treatment of pneumonia disease. But it gives the 2010/11 and 2011/12 figures for treatment of respiratory diseases, of which pneumonia constitutes the bulk, as Shs 160.3 billion and Shs 181.6 billion respectively. These constituted 3.5 per cent and 3.8 per cent of the ministry’s disease-based cost for those years and translates to over Shs 200,000 per person.

Vaccination for pneumonia in Uganda costs about $7 (about Shs 18,200) though it is wholly provided under the GAVI Alliance and WHO assistance.

The money lost to diarrhoea and pneumonia and their consequences could otherwise be put to good use such as equipping health centres or promoting primary health care (PHC) at the grassroots just like Rwanda and Ethiopia have done.

The two African countries have invested heavily in primary health care, capitalising on village-level structures to arrest and treat diseases early before they get worse. This, they reason, would in turn result in a much healthier population and workforce in the future.

GAVI and WHO say vaccines should be made part of routine immunisation for all children. Uganda is waking up to vaccinate children against these two ailments in addition to other traditional immunizable diseases.

Dr. Mayanja says the pneumococcal conjugate vaccine (PCV10), which immunises against 10 of the 18 strains of pneumococcal pneumonia was rolled out at the end of 2013. The 10 strains being immunised against are the commonest in Uganda, he explains.

The rotavirus vaccine (against diarrhoea) was launched in April this year though it is so far only being piloted in 14 districts. Dr. Mayanja says it will be fully rolled out in 2016.

The vaccine will be majorly funded by GAVI Alliance, which is supported by a number of international organisations that include the World Bank, the Bill & Melinda Gates Foundation, and donor governments, among others. The government of Uganda is expected to provide co-funding for the rotavirus vaccine amounting to $1.59m (about Shs 4.29bn) by December 31, 2014.

Dr. Mayanja says the target for the pneumococcal and later the rotavirus vaccinations, is to have all children less than one year immunised. But the success of these vaccines will depend on the implementation and monitoring.

Uganda needs a well-established and spread-out grassroots monitoring system such as the community health workers (CHWs) in Rwanda and women’s development army (WDA) in Ethiopia. In both countries, these teams made up of volunteers, get educational messages from their ministries of Health, and share them with the households they monitor.

These volunteer health monitors refer those in need of attention to places where they can get initial health care including immunization by trained personnel who also do the cases for more specialised care if need be.

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Ask people how sick they felt when they last had a bout of malaria, and you will hear that the dizziness, joint pains, headache and sour mouth are all still vivid in their minds.

Yet after 30 years of research, no widely-effective malaria vaccine has yet been developed. As a result, the disease continues to pose an enormous threat to human health. At least one-third of the global population is at risk of contracting it. Malaria is a parasitic disease. When an infected mosquito bites a person, it injects immature forms of the parasite, called sporozoites, through its saliva. In rare cases, the parasite also can be passed from mother to child before or during delivery.

The World Health Organisation (WHO) estimates that there are about 225 million new cases of the disease – and 800,000 deaths – annually, mostly involving African children under the age of five years.

Malaria is also responsible for about 10 per cent of Africa’s entire disease burden, and is responsible for 30 to 50 per cent of inpatient admissions in countries where it is endemic. Scientists say children are the most vulnerable; so, developing a vaccine for them is the top priority.

VACCINE DEVELOPMENT EFFORTS
Malaria poses an enormous scientific challenge. For one thing, the parasite is remarkably elusive. Plasmodium falciparum, the most common malaria-causing parasite, changes form as it moves through the human body. Moreover, it has more than 5,000 genes that may vary from case to case.

“The parasite changes its forms as frequently as possible,” notes Dr. Fred Kironde, a biochemist who has been involved in malaria vaccines research for the past 15 years. “It has many proteins that confuse the human immune system.”

Compounding the problem is the fact that people living in regions affected by malaria usually develop natural immunity and hence do not show symptoms of the disease even though they often harbour the parasite; so, it can be transmitted from them to others by mosquitoes.

The key to stopping the disease is finding a way to reduce immune responses at the point of transmission, either from mosquitoes to humans or from humans to mosquitoes. That’s when the parasites are few in number, and hence most vulnerable. Once in a human host, they multiply from tens into billions, overwhelming the body as well as scientific attempts to defeat them.

Assuming a vaccine is eventually developed, eradication of the disease will depend on achieving high vaccination rates across broad populations. Scientists say even with a vaccine, other interventions – like achieving widespread use of insecticide-treated bed-nets will be necessary.

Together, these strategies could shrink the reservoir of parasites in the human population, just as population-wide vaccines have significantly reduced or even eliminated other infectious diseases such as smallpox, polio, measles, mumps and, more recently, meningitis A.

Stephen L. Hoffman, chief executive and scientific officer of Sanaria Inc., a USA-based biotechnology firm dedicated to producing a malaria vaccine, told this reporter by email that possible vaccines used in clinical trials so far have generally managed only to keep people from actually getting sick with malaria, rather than completely preventing transmission.

Scientists are striving to develop, anti-infection vaccines (AIVs), which would prevent people from becoming infected at all after being bitten by infected mosquitoes. They are also seeking transmission-blocking vaccines (TBVs) which would prevent mosquitoes from becoming infected after feeding on infected people. Vaccines that could achieve both goals would be ideal.

Research also is focusing primarily on a vaccine that could be given to African children, since they are the most at-risk of the deadliest form of the disease.

“We think it is time to turn the tables on this disease and to rid the world of it entirely,” said Dr. Ashley Birkett, director of PATH Malaria Vaccine Initiative (MVI). “Vaccines are likely to provide the best opportunity to complement drugs and vector-control measures in reducing malaria transmission to zero, and they are the single most important intervention for preventing reintroduction.”
PROMISING MALARIA VACCINE

According to Dr. Kironde, a possible vaccine called RTS,S so far has shown the most promise, although many other possible vaccines are being tested. Clinical trials of RTS,S in adults were conducted in the USA in 1992 and in Africa in 1998.

In Africa, a phase II [intended to monitor safety, potential side effects, immune response and determine optimum dosage and schedule] trial in 2003 involving more than 2,000 children aged one to four in Mozambique found that the vaccine reduced the risk of clinical malaria by only 35 per cent and the number of cases of severe malaria by 49 per cent.

“This vaccine is all the hope we have now. We have a lot of hope in it because of the episodes it averts. It has efficacy against severe malaria in infants, with more protection in older children. We are banking on it,” says Kironde. He estimates that an effective vaccine would save “at least” 100 lives per day.

WHAT WOULD HAVING A MALARIA VACCINE MEAN?

But an effective vaccine wouldn’t be the complete answer. “I would give it in combination with other methods,” says Dr. Richard Idro, a Paediatric neurologist at Mulago hospital and lecturer at Makerere University. “Vaccines only complement other control measures.”

With its low efficacy, the vaccine has another downside. Unlike other vaccines such as polio and chicken pox, which may offer long-term immunity, RTS,S can only last one or two years in the body. That means that, unless improved, the vaccine would have to be administered repeatedly over time. “For plasmodium falciparum, the memory is so short-lived.” Still, he says, scientists hope it would provide protection for children when they are most vulnerable. Adults, Dr. Kironde says, ‘can build their own immunity.”

The malaria research community hopes to improve the efficacy of RTS,S to 80 per cent or more, according to both Kironde and Hoffman. If they can achieve that goal and the World Health Organization approves the vaccine, the next step will be for governments to agree to have it administered.

Immunization is important. On its own, it accounts for about 25 percent of Millennium Development Goal 4 (MDG4), targeting for a reduction of child mortality rates by two-thirds by 2015.

According to the Sabin Vaccine Institute, when it comes to children’s health, vaccination has proven to be a wise investment. Vaccinating children not only prevents unnecessary suffering and death but also promotes the development of healthier, more productive families, communities and societies.

And many national immunisation systems worldwide, aim at expanding vaccination coverage and introducing new vaccines against hepatitis B, Haemophilus Influenza type b (Hib), Rotavirus, Human Papilloma Virus (HPV), and Pneumococcal disease.

But as these health programs expand and newer vaccines are introduced, costs are rising faster than government budgets putting a strain on national health programs in many developing countries. In Uganda, these rising costs are further enlarged by the growing birth cohort, each year, and the increase in the number of districts that further strains the cold chain systems.

For instance, immunization used to cost cents per child in Uganda. It was estimated that to fully immunize a child against traditional vaccines such as Tuberculosis, Diphtheria, Pertussis, Tetanus, Polio, and Measles used to cost only $20 on average.

Today, to immunize a child costs at least $34 (conservative immunization schedule) or $42 (ideal schedule) to ensure full immunization. However, budget allocation officials still do not see the urgency of increasing the budget for immunization. Meanwhile, the Uganda National Expanded Programme on Immunization (UNEPI), which is in charge of vaccines, faces one challenge, increasingly, vaccine-preventable diseases are not observed in society today as in the past.

So this coupled with the silently crippling support of the GAVI Alliance, which provides over 80 percent of the current immunization budget, signals to the Ministry of Finance that the sub sector has sufficient resources to finance all its activity.

They do not seem to understand that most of the external funds are earmarked for new and under-utilized vaccine procurement, and not the delivery of vaccines, which is rightly the government’s responsibility.

Vaccines are expensive, but cost effective. Their payoff exceeds their cost, especially when the challenge to deliver them to every last child is executed effectively.

Who Pays for these Vaccines?

According to the national Immunization policy, vaccines within the national immunization schedule are provided free to the public. These include, Tuberculosis, Diphtheria, Measles, Polio, Tetanus, Whooping Cough, and Hepatitis B. There is a set of new and under-utilised vaccines not on the national schedule that are provided at a fee at private institutions including Pneumococcal, Rotavirus, Hepatitis A, Influenza B, Papilloma Virus, Yellow fever.

Who pays for the vaccines that are free to the public?

The government of Uganda through UNEPI, calculates the number of vaccines that will be required in a document called a requisition. This requisition is passed on to the National Medical Stores (NMS), which in charge of procuring and distributing these vaccines. The NMS in turn procures the vaccines through UNICEF Copenhagen, who are contracted as procurement agents to procure vaccines for many developing countries.

They also ensure constant supply as demanded by most countries that rely on UNICEF to complete the international procurement process from a few WHO qualified vaccine manufacturers.

According to the national budget, there are three streams of funds required to ensure every child is fully vaccinated; the traditional vaccine budget for the six traditional vaccines mentioned above. These cost the government 1 billion Uganda Shillings per year and are fully paid for by the government.

The second is the operational costs budget, which ensures that the cold chain is well maintained. This includes gas to keep vaccines at the required temperatures, and transport to get them to the regional vaccine stores, and it also supports monitoring.

Finally, there is the co-financing budget, which is the government of Uganda’s 10 percent contribution to GAVI for the purchase of new and under-utilised vaccines. Currently, this includes the Pneumococcal vaccine expected to be scaled up next year to cover the entire country. The newer vaccines are more costly with the government contributing 12.2 billion Uganda Shillings and GAVI contributing 26 billion shillings.
through the GAVI co-financing mechanism. Who are Global Alliance for Vaccines and Immunisation (GAVI Alliance)?

Most developing countries have been generously supported by the Swiss-based GAVI Alliance to introduce life saving new vaccines that have been developed with the emerging new technology including Pentavalent, Pneumococcal Conjugate, Human Papilloma Virus and Rotavirus vaccines. The GAVI Alliance was established in 2000 with the mandate to raise and channel funding for immunisation in more than 70 of the world’s poorest countries.

GAVI brings together the leading players in immunisation including the World Health Organization (WHO), the United Nations Children’s Fund (UNICEF), the World Bank, the Bill & Melinda Gates Foundation, donor governments, developing country governments, civil society organisations, research and technical health institutes, and the pharmaceutical industry.

However, not all countries are GAVI eligible, and even those that are, including Uganda, are only eligible within a certain threshold of the national GDP (currently below $1,570 per capita). Uganda’s GDP is currently $630 per capita (National Population and Housing Census 2014 Provisional Results Report). But once oil production begins, the Ministry of Finance, Planning and Economic Development estimates that Uganda’s GDP will triple.

It will then graduate to the countries that are not eligible to belong to GAVI. With oil, Uganda will be able to finance its own immunisation programme and purchase vaccines.

So Uganda should begin planning for GAVI graduation to be able to sustain the gains made in immunization to date.

The scenario that happened when GAVI funds were suspended in 2006 should never repeat. At the time, there was no money allocated to the national immunization budget from the government. Additionally, senior government officials were discouraged that the prices of vaccines were not dropping at the expected rates. And GAVI did not appear to have an exit strategy that would motivate nations to seek alternative innovative mechanisms.

Today, GAVI has developed that plan to graduate countries once they reach a certain threshold of GDP. It is upon this condition, that some countries have conceded to the importance of maintaining the immunisation programmes and look for alternative financing to continue with the new vaccines on the routine national schedule.

In addition, recipient governments are fully aware of the importance of learning the negotiation skills required to ensure constant supply and favourable tier pricing from the manufacturers of pre-qualified vaccines.

According to Helen Saxenian et al (In Overcoming challenges to sustainable immunization financing: early experiences from GAVI graduating countries, 2014), over the 5-year period ending in 2018, 16 countries with a combined birth cohort of over 6 million infants requiring life-saving immunizations are scheduled to transition (graduate) from outside financial and technical support for a number of their essential vaccines.

Now, the onus is upon the government of Uganda (not GAVI) to start thinking about how to successfully end their dependence on development aid and achieve considerable self-sufficiency through innovative and sustainable financing mechanisms.

To reduce dependency is to increase country ownership. The latter is an underlying principle of the Decade of Vaccines Global Vaccine Action Plan (GVAP), to which Uganda and 93 other countries are signatories.

The GVAP, approved in 2012, lays out a set of guiding principles and strategic objectives, through which, WHO Member Countries will incorporate “game changers” that will fast track development of new vaccines and related immunization technologies, eradicate polio and control measles and other vaccine-preventable diseases.

It will also make national immunization programs both technically sustainable and sustainably financed and ensure populations everywhere recognise the value of immunizations.

Despite numerous advocacy attempts for increased domestic budget for immunization, the UNEPI programme has over the last 14 years had very marginal increments.

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