BRIEFING PAPER

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Strong communication is the smarter, cheaper way to transform African public health

Better disease detection and prevention in Africa depends on better communication. This is particularly the case in Sub-Saharan Africa, where disease outbreaks often occur a long way from the nearest health facilities or labs. Cheap and simple tools exist to transform local and national capacity to detect and prevent disease. If governments invest more time and money now, they will save millions of dollars and lives in the future.

Introduction:

We now know that 75 per cent of all emerging infectious diseases that have affected humans over the past three decades originated from animals[1] – HIV, Ebola, malaria and rabies, to name a few.

Many of these diseases originated in Africa, where they continue to exert a massive toll, exacerbated by poverty, malnutrition and poor health facilities.

Yet Africa remains a continent that falls far short of the infrastructure and resources needed to detect, monitor, control and prevent disease outbreaks effectively and efficiently. It also lacks the health services to build local, national and regional resilience to disease outbreaks.

Part of the problem is that the site of a disease outbreak is often rural, a long way from health facilities and labs, which tend to be concentrated in towns and cities.

Poor education and patchy communications systems can prevent information about disease outbreaks reaching those able to diagnose and advise local communities.

The result is disease outbreaks that can go undetected or misdiagnosed, leading to diseases spreading and further damaging lives and livelihoods.

Better education and communication tools such as radio and smartphones are vital to improving communication between local people and health services, and making

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[1] Asia Pacific Strategy for Emerging Diseases (2010)

disease detection and prevention more robust and widespread.

So what can be done?

Since 2008, the Southern African Centre for Infectious Disease Surveillance (SACIDS) has been working to overhaul Africa's capacity for detecting and preventing disease.

It does so through a One Health approach: animal, human and environmental health are tackled together, in the awareness that they are increasingly interconnected.

Many people think that epidemiology and disease prevention is prohibitively expensive, requiring high-tech labs and specialist equipment.

But this doesn't have to be the case: there are ways to overhaul Africa's capacity for controlling disease at a fraction of the cost of conventional lab resources. Basic tools and communication systems can enable high quality disease surveillance and science at a fraction of the cost.

Cheap tools to detect and monitor disease

One route to transforming African disease control lies in the cheap and ubiquitous smartphone and community radio. These increase the capacity of local people to identify and report disease outbreaks to health services.

For the past few years, smartphone prices have been getting lower and lower, driving a digital revolution in many parts of Africa. In 2015, almost half the population of Africa

(557 million people) subscribed to mobile services, and experts project there will be 720 million smartphone users – 57 per cent of the population – by 2020.[2]

Africa has been a forerunner in using mobile technology to transform money transfer. Of the top 20 countries for mobile money transfers, 15 are in Africa, and the Kenyan tool M-Pesa has taken East Africa by storm.[3]

But this ingenuity has not extended to public health and disease detection.

SACIDS aims to change this. The organisation has been researching the best ways to harness smartphones to improve disease detection and control.

It has been working with certain vulnerable groups to improve access to public health supported by mobile technology, including the Maasai in Kenya and Tanzania.

With support from the International Development Research Centre, SACIDS is also establishing the first radio station to serve the 100,000 Maasai pastoralists living in Ngorongoro in northern Tanzania.

Case study: Life on the frontline

One group severely affected by climate change and zoonotic disease are the Maasai of East Africa. The Maasai live a semi-nomadic life, moving with their herds of cows, goats and sheep in search of food, water, in lands spanning Kenya and Tanzania, moving

through porous national borders. The lives of the Maasai, their livestock, wildlife and the broader environment are intimately linked and interdependent.

Their unique way of life faces numerous threats. Climate change is altering weather patterns and access to water, and the region has faced bad droughts in recent years. The 2016 El Niño brought in its wake severe drought followed by heavy early rains, leading to outbreaks of human and animal disease.

Urban development is encroaching on Maasai lands and migration routes, and competition for limited grazing and water is intensifying: this pushes wildlife, animals and humans closer together, creating conditions for diseases to thrive. Issues of land ownership and rights and the growth of conservation is another threat.

Their lives are also challenged by livelihood cultural practices that exposes them to zoonotic disease. Livestock trading and consumption is central to Maasai culture. The Maasai often drink unpasteurised milk and handle and eat undercooked meat, which exposes them to zoonotic diseases like Rift Valley Fever, which move between wildlife, animals and humans.

Many travel long distances to trade animals at market and often cross national borders: differences in the quality and extent of health services in Tanzania and Kenya is another reason that diseases can spread easily. Animals are slaughtered at market and then body parts contaminated with parasites are dumped on nearby land, where they are often

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[2] The Mobile Economy: Africa 2016 (GSMA 2016)
[3] Rachel Botsman, Mobile Money: The African lesson we can learn (Australian Financial Review, 2014)

eaten by dogs, which then carry parasites to homes and communities.

The answer in the palm of their hands

The Maasai's knowledge of disease, disease vectors and climate is extensive, drawing on centuries of indigenous experience. But some diseases are better treated with conventional medicine. Many Maasai are unable to buy drugs for animals or humans – human medicine is particularly hard to come by – and often rely on their own treatments, many of them ineffective in the long-term.

Most Maasai live in rural areas, far from labs and specialist equipment for detecting and diagnosing disease.

One solution to closing this communication gap and increasing public education about disease lies in the smartphone.

Until quite recently, mobile phones tended to be an urban phenomenon. This is no longer the case. Around 40 per cent of the Maasai own mobile phones, mostly cheap smartphones imported from China.

These phones may be cheap but they also have the power to transform the Maasai's ability to detect, report and treat disease, potentially preventing large outbreaks and safeguarding lives and livelihoods.

The tech for programming phones exists. If they suspect a disease outbreak, the Maasai can use their smartphones to photograph an animal's symptoms and send these images to health experts for analysis and, if necessary, assistance. These experts can then diagnose the disease and respond to the Maasai's messages with suggestions for treatment, control and future prevention.

SACIDS has also developed [Afyadata Manager](#), a smartphone-based tool that analyses field data and then sends feedback to the data collector, where it is analysed immediately. The system is intelligent enough to detect any abnormal pattern: if an abnormal pattern is discovered, an alert is then sent to higher authorities. This is an open source tool: other institutions and governments can download, adapt and use it easily and for free.

This knocks out the need for diagnostics via complex laboratories and expensive transport and resources. The huge distances between rural grazing spots and urban clinics is surmounted with the click of a camera phone and a message: these distances are no longer a barrier to disease detection and control.

These systems also give researchers vital insight into Maasai knowledge of disease, disease vectors and climate that draws on centuries of indigenous experience.

These kinds of tools are not just useful for the Maasai. They can transform the lives and livelihoods of all kinds of people and communities across Africa – farmers, herders and all those living in rural communities.

"Smart phones could be a great asset in detecting unusual disease events. In Africa, this technology is being used for transferring money, but we're not putting enough investment in revolutionising disease surveillance. We should see it as the primary means of disease surveillance."

– Professor Mark Rweyemamu, Director, SACIDS

Tune in to control disease

Radio is a vital tool for communication in countries across Sub-Saharan Africa. For many people, radio is the first port of call for news and information: on average, people listen to the radio twice a day, whereas the average for internet use is once every other day.[4]

When it comes to public health, radio is also crucial. The Ebola crisis of 2014-2016 reaffirmed the role of radio as a trusted tool for public health communication, with stations and musicians across the affected countries using radio to disseminate vital health information.[5]

SACIDS is setting up the first community radio station to serve the 100,000 Maasai of Ngorongoro in northern Tanzania. Through participatory programmes, the radio station will education communities about animal and human health through participatory. It will

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[4] [Unpacking sub-Saharan African media consumption habits](#) (*How We Made It In Africa*, 1 June 2016)
[5] Imogen Mathers [Singing safety rules for avoiding Ebola: Interview with Carlos Chirinos](#) (SciDev.Net, 24 October 2014)

also provide a fast emergency alert system to let communities know about potential health or weather-related risks that require immediate action. This will help build up local knowledge about disease, close the communication gap between people and health services, and build local resilience to the effects of disease outbreaks.

What can governments do?

We now know that simple tools and systems can transform disease detection for a fraction of the cost of high-tech labs. But governments still aren't investing enough in getting these tools and systems up and running.

7 recommendations for governments:

- **Invest in radio stations and smartphone technology**, programming and systems. Stop regarding smartphones as a luxury: they are cheap and vital to disease surveillance. Programmes to increase smartphone reach should be supported
- **Reduce the bureaucracy** that often delays the establishment of new community radio stations
- **Ensure government health offices function** properly and respond to farmers and herders efficiently
- **Ensure ministries are a gateway not a barrier** to better disease diagnostics and public health
- **Run training programmes** for government health and diagnostic services and for Maasai and other pastoralists and farmers
- **Invest in systems** to improve knowledge and keep up-to-date on dynamic ecosystems, climate change and disease
- **Show leadership:** show to the rest of the world how Africa can competently address its public health challenges and show others how to resolve theirs

Notes to editors:

- SACIDS (the Southern African Centre for Infectious Disease Surveillance) is a virtual centre with a physical base at the Sokoine University of Agriculture in Tanzania. It was established in 2008.
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