

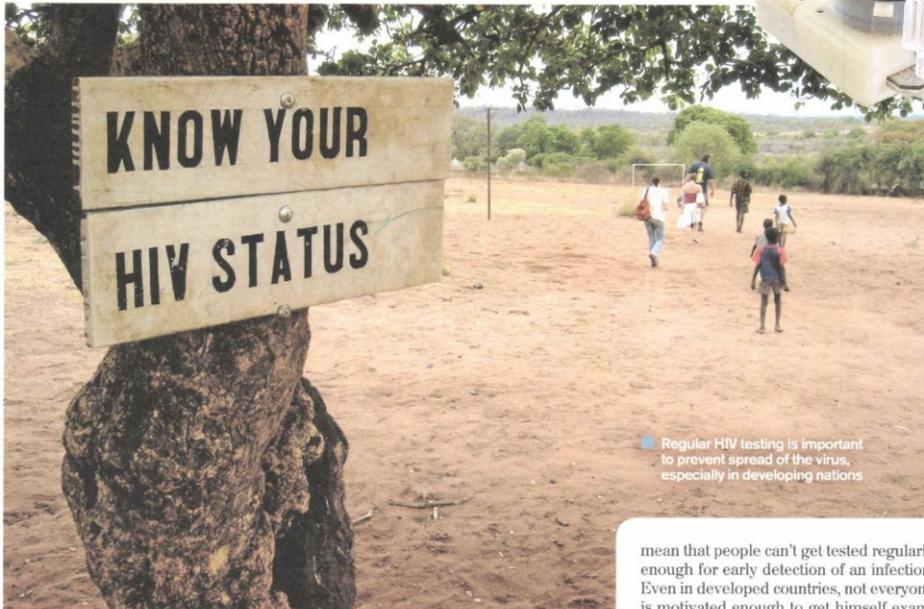
Headline	Testing for HIV with your phone		
MediaTitle	Focus Malaysia		
Date	28 Feb 2015	Color	Full Color
Section	Supplement	Circulation	20,000
Page No	14	Readership	60,000
Language	English	ArticleSize	932 cm ²
Journalist	N/A	AdValue	RM 16,047
Frequency	Weekly	PR Value	RM 48,141



DEAS



by TAN JEE YEE



Regular HIV testing is important to prevent spread of the virus, especially in developing nations



The HIV tester (above left) works with a smartphone and the rHEALTH can diagnose many diseases with a single drop of blood

Testing for HIV – with your phone

HIV is no laughing matter, and it's important that the world moves quickly to increase prevention of the disease, especially in developing countries. Cheaper and faster solutions are needed more than ever

THE HUMAN immunodeficiency virus (HIV) is still a real and dangerous problem persisting on a global scale. According to the World Health Organization, there are more than 35 million people living with HIV worldwide. In 2013, more than 1.5 million people died of HIV-related diseases.

The numbers are also harrowing in Malaysia. In 2012, the country recorded 4,799 cases of HIV. While the number of new cases each year has not risen, it is still worrisome to note that reported cases of HIV have held steady year-on-year since 2008 (in that year, 4,633 cases were reported).

What's worse is that, according to the Malaysia AIDS Council, the number of students who have been infected with the virus has increased. In 2008, a total of 28 students contracted HIV. In 2012, the number had risen to 170.

There is no cure for Acquired Immune Deficiency Syndrome (AIDS), which is the result of contracting HIV, which is why there is an ongoing global effort to raise awareness and prevent further spread of the virus. The surest way to prevent the spread of HIV is for everyone, especially those in the high-risk groups, to be tested for HIV on a regular basis.

But therein also lies the problem. A HIV test is not a procedure that can be done

quickly. And neither can it be done cheaply. These problems become more acute in areas where there is already a high prevalence of the disease, such as Africa, where 60% of all HIV patients reside.

Conditions such as poor infrastructure

mean that people can't get tested regularly enough for early detection of an infection. Even in developed countries, not everyone is motivated enough to get himself examined by a medically qualified person.

Early detection of HIV is also essential for another reason. At the Centre for Disease Control in Atlanta, United States, it has been noted that women who find out early that they have contracted HIV and begin to take antiretroviral medication as recommended can reduce the risk of transmitting the virus to their offspring to less than 1%.

The solution is to have something that can detect HIV quickly, effectively and cheaply. Thankfully, a duo from Columbia University might have something in hand.

Checked over phone

Tiffany Guo and Tassaneewan Laksanasopin's answer to the problem of detecting HIV lies in a communications device – the smartphone. Along with other biomedical engineering researchers, they have managed to invent a smartphone accessory that can detect HIV with just a finger prick. The best part? The device only costs US\$34 (RM123.70) to make.

The idea for the device has been brewing since 2007, but it's not until 2013 that it finally took off. The eureka moment happened when the researchers realised that they could significantly reduce production cost by piggy-backing on the

To use the device, you only need to prick your finger and squeeze a drop of your blood onto a cassette, which is then fed into the device. After about 15 minutes, the results will appear on an app loaded on the phone.



Early detection of HIV can help stop the virus from afflicting children born to HIV-positive mothers

power of smartphones today. The phone will be able to handle the power and data collection, enabling the HIV tester device to only function with basic equipment needed to perform a test.

All that is encapsulated into a dongle about the size of your palm, which can be plugged into an ordinary iPhone or an Android phone via the audio jack. To use the device, you only need to prick your finger and squeeze a drop of your blood onto a cassette, which is then fed into the device. After about 15 minutes, the results will appear on an app loaded on the phone.

It all sounds good, but how accurate is the device? According to Guo and Laksanasopin, it functions just as accurately as any full-fledged test. Over the span of two weeks, the duo have tested the device with 96 patients in Kigali, Rwanda. All the researchers there conclude that it performed as well as commercially available diagnostic tools now used to run tests in the field.

Because of how effectively it works and how cheaply it can be made, the dongle can potentially impact the fight against HIV in Africa and other developing countries significantly. It can also help with HIV prevention in developed nations, as testing can be done easily and quickly.

The question, of course, is whether this device can be accessible to people from all walks of life. The developers will have to consider other risks derived from using smartphones, with data security being the biggest concern. But for what it is, this dongle may help usher in an array of cheap and effective disease testers.

A drop of blood

Today, smartphones are already part of everyday healthcare, capable of recording our steps and heart rate and making all that information about the state of our heart and health available with the use of simple but intuitive tools.

That is just one aspect of it, however, as researchers are striving to create even more powerful portable diagnostic tools.

The rHEALTH is one such device. With just one small drop of blood, the rHEALTH can diagnose hundreds of diseases, ranging from the common flu to serious ailments such as pneumonia and Ebola. Thanks to its small size, patients only need to give 1,500 times less blood than what is required for regular tests. More excitingly, the rHEALTH is actually tested in simulated lunar and zero gravity environments, meaning that it may one day make such medical examinations possible right up to our final frontier – space.

Microculus, a new start-up, is also building a low-cost, open-source device that can check for dozens of cancers using a single blood sample. Cancer diagnostics that come in quickly and easily can be crucial in the fight against the affliction, as early detection can significantly increase the chances of successful treatment.

As smarter devices are made smaller, we're standing on the brink of a new world of healthcare. When healthcare can be placed in the hands of the people themselves, we might save more lives than ever before. [FocusWeek](#)