An advocacy for diagnostics in a digital age

In 2014, Professor Rosanna Peeling became the first woman to receive the George MacDonald Medal for contributions to tropical medicine. As a champion for the value of diagnostics, we spoke to her about the potential diagnostic technologies of the future.

You helped to establish the International Diagnostics Centre (IDC). Why?

The founders of IDC have worked in diagnostics for global health for many years. What we observed, especially in the context of diagnostics for use in resource-limited settings, is that stakeholders, including developers, suppliers, funders and users of such products, struggled to find information on the diagnostic products most needed for use in global health. What kinds of products should those be, for instance, and how can we get those products approved and onto the market?

As a result, we came together to form an organisation that could provide this sort of information. We began by creating a website that would house the necessary resources, bringing together materials from multiple sources so that information on the development, regulation and toolkits for the introduction of diagnostics – especially those destined for resource-limited settings – could be found in a single, easily accessible resource available to everyone. We now also have plans to create a virtual campus with eLearning modules on the IDC website to increase capacity in critical decision making in diagnostics in developing countries.

The IDC strives to create a world where every person has access to high-quality diagnostics, an ambition shared by the recently adopted Sustainable Development Goals. Can you reveal what you hope to achieve by 2020?

The IDC website is already a rich, open platform of information on diagnostics for resource-limited settings, but we continue to expand its contents and build capacity in critical decision making. The initial focus areas for the website are diagnostics associated with HIV/AIDS and key co-infections, including sexually transmitted infections, hepatitis C virus and tuberculosis. We have also recently introduced a dashboard on dual elimination of mother-to-child transmission of HIV and syphilis. By 2020, we would expect to include more resources on HIV co-infections and possibly other disease areas, where appropriate, and a virtual campus that is a global centre of learning on diagnostics.

What is a point-of-care (POC) test? How reliable and effective is this diagnostic approach?

Although there is no one standard definition of a POC test, it is typically considered to be one that is offered to patients who are initially present for care and treatment at places such as health centres and health posts, as opposed to centralised testing sites. However, it can be argued that to be a true POC test, the test must be performed during a single patient visit and permit patient management decisions, including treatment, to be made at that same visit. In other words, a POC test is not a single type of test technology but any test that can be used at the point of care.

Currently, the most widely used POC tests are rapid diagnostic tests, which are generally disposable, lateral flow tests for the diagnosis of HIV/AIDS and malaria. For the most part, these have been both reliable and effective, although we know that the quality of the testing is not always assured and can be improved with more consistent training and monitoring. Quality monitoring of POC tests can be improved with the use of connectivity solutions, allowing for electronic records of proficiency panel testing to be linked to POC test results.

By refining and perfecting POC tests, how can healthcare systems be improved?

The hope is to use them effectively to increase access to testing and, at the same time, improve linkage to care for improved patient outcomes. This is the promise of refined and perfected POC tests. But the tests themselves can only achieve these results if the diagnostic system in a given country is robust. Without strong systems, the promise of POC testing can only be partially achieved. In a digital age, it is possible to improve healthcare systems by digitising...
test results and using connectivity solutions to improve supply chain management, quality assurance and linkage to care and treatment.

As mentioned, a key interest of yours is mother-to-child disease transmission, particularly of HIV and syphilis. In July 2015, Cuba became the first country to eliminate these diseases. Can you offer an insight into how they achieved this enormous feat?

Cuba has an efficient and effective healthcare system in which universal access to a basic level of healthcare services is guaranteed, and maternal and child health are prioritised. Achieving health targets, such as the dual elimination of mother-to-child transmission of HIV and syphilis can only be achieved with a combination of strong political commitment, access to quality services and a system of monitoring and evaluation to ensure programme effectiveness.

As the first woman to be awarded the George MacDonald Medal by the Royal Society of Hygiene and Tropical Medicine, what advice would you give to women at the beginning of their career in your field?

My advice is to find your passion, have a clear vision of what you would like to do and keep an open mind so that you do not miss opportunities to achieve the impossible.

For the vast majority of people in developed countries, paying a visit to the local GP for a check-up is a crucial means of monitoring their health and wellbeing. As well as asking questions about patient’s physical and mental health and making observations during the course of the appointment, the doctor may also ask for a sample of blood or urine, for example. These are then sent to a laboratory to be tested and analysed.

Broadly termed in vitro diagnostics (IVDs), such tests play an important role in managing the health of individuals and society. As well as enabling doctors to diagnose a disease, they can also help with the management of the disease. Indeed, regular check-ups can even prevent the disease from occurring in the first place. Diagnostics are therefore an essential aspect of effective healthcare practices.

A BRIEF HISTORY
Unfortunately, in developing countries it is often not as simple as contacting your local surgery and booking an appointment. A lack of effective healthcare systems is just one consequence of a country’s weak infrastructure, and so researchers around the world have sought to address this problem through point-of-care (POC) diagnostics. These could, for instance, be portable devices enabling healthcare professionals to test individuals in non-laboratory settings to get immediate results.

Although POC diagnostics provide a means of managing the health of individuals in resource-limited settings, there have been a range of problems associated with the tests. The lack of a robust diagnostic system across a given country means that low-quality tests are often introduced to the market place. In addition to the potential for incorrect test results, the information gathered from the wide variety of POC devices is often asynchronous, meaning one cannot be compared with another to provide evidence for best practice.

A FORUM FOR ADVOCACY
Professor Rosanna Peeling is one researcher who recognises the importance of quality-assured IVDs in enabling global health. In addition to her role as Chair of Diagnostics Research at the London School of Hygiene and Tropical Medicine, Peeling also serves as Director of the International Diagnostics Centre (IDC). Peeling established the IDC as a means of advocating the value of diagnostics in improving global health, but also as a place that could act as a forum to inform, share and move diagnostics forward. “In addition to the website, we agreed that the diagnostics landscape for global health needed an organisation that could be a neutral advocate in the space,” explains Peeling. “The IDC seeks to play that role by convening or co-convening consultative meetings on topics of critical importance in diagnostics for global health.”

Working alongside Peeling is CEO Maurine Murtagh, who is making significant contributions to shaping the Centre’s continuous development. In striving to ensure that every person has access to high-quality diagnostics, Peeling, Murtagh and the team view education and innovation as key to achieving their ambitions. It is in the IDC’s capacity as a forum that they have been able to bring stakeholders together to catalyse action on a variety of specific topics of particular concern for diagnostics in resource-limited settings. One recent discussion revolved around

Improving access to affordable quality-assured diagnostics

The London School of Hygiene and Tropical Medicine, UK, is home to the International Diagnostics Centre, which works towards accelerating access to affordable quality-assured diagnostics. The Centre’s team is facilitating the development, evaluation and implementation of in vitro diagnostics necessary for global health.
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**THE IMPORTANCE OF EDUCATION**

One of the key methods of achieving the IDC’s goals necessarily focuses on a process of education. The website therefore functions as a go-to learning resource, with toolkits and eLearning modules available to access wherever you are in the world. While toolkits are designed to put functional resources in the hands of those who require them to perform diagnostics, the eLearning materials provide training in easily accessible formats to complement the resources. In addition, a section of the website is dedicated to inviting visitors to suggest their own ideas for a section of the website is dedicated to a place that could act as a forum to inform, share and move diagnostics forward.

Peeling and her colleagues are intent on continuously improving the services they provide and have high hopes for the future. “We hope to have connectivity solutions that will enable countries to have timely information on diagnostic testing results to inform disease control strategies for health security,” says Peeling. “These solutions can also be used to improve quality assurance and supply chain management, making healthcare systems more efficient.” The team also envisions that by 2020, there will be regularly scheduled diagnostics forums in different parts of the world each year, where information is collated and shared to further realise the ambitions of the Centre.

**USSHERING IN THE FUTURE**

While IVD devices are necessarily limited by the available technology at the time of their development, digital technology has heralded an unprecedented epoch that could enable them to capture and transfer the data that diagnostic testing accumulates. There are problems associated with integrating digital technologies in some areas; most notably, in the incurrence of costs, where using an electronic reader that can integrate test data reporting adds a cost to the test and is sometimes resisted for that reason. But the fact remains that digital technology presents an opportunity that cannot be overlooked.

The recent Ebola crisis demonstrated the importance of integrating digital technology in meeting the needs of the global health security agenda. Digital technology helped facilitate and improve patient record management, clinical treatment of patients and quality monitoring, for instance. Of course, the implementation of such technologies is not without its problems, but Peeling remains positive: “There are issues to be addressed, including data ownership and governance, and privacy issues, but these can be resolved”.

Now firmly in the 21st Century, it is perhaps surprising that not everyone has access to the high-quality diagnostics needed for their health and wellbeing. With Centres like the one Peeling established, each new day brings us closer to providing diagnostics for all.