

Guest editorial

What role does technology play in improving access to healthcare?

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Introduction

Over six million children under the age of five die each year (WHO, 2013a) and over 1,000 women die every day from preventable causes related to pregnancy and childbirth (WHO, 2012a); 63% of all deaths, every year, are due to non-communicable diseases (WHO, 2011). Improving access to health technologies would, in my view, go a long way to reducing mortality rates. Health technologies, which include medicines, vaccines and medical devices, are an indispensable component of effective healthcare systems. Medical devices in particular are crucial to the prevention, diagnosis and treatment of illness and disease as well as for patient rehabilitation. However, in many instances patients simply do not have access to these technologies. In this editorial, I draw on my global experience working with GE Healthcare to examine the reasons for this, ways of addressing the barriers, and highlight specific examples of medical devices that have proven their worth.

Examples of game-changing technologies

Vscan is a compact portable visualisation tool with ultrasound technology that provides a non-invasive look inside the body for immediate visual validation of what a clinician can feel or hear. The additional information helps with optimising the course of treatment for a patient and reduces the time required for diagnosis. The device is small and lightweight, which makes it easy to carry and its battery capacity provides over one hour of scanning on a single charge, giving it enough power for a full day's worth of patient examinations (Immelt *et al*, 2009). It is being used in low resource settings by health paraprofessionals in Tanzania, Ghana and Bangladesh, attracting more mothers to the formal health system and increasing antenatal attendance and institutional delivery (WHO, 2013b).

GE's Lullaby LED Phototherapy (PT) is another good example. Many babies have to be treated for hyperbilirubinemia (elevated levels of bilirubin), commonly known as neonatal jaundice. The treatment is typically done by shining a specific wavelength of blue light on the infant. Traditional tube-light or compact florescent lamps tended to have a high cost of replacement, along with issues with the supply chain in remote areas. Using the knowledge of its lighting business, GE replaced the bulbs with LED lamps, which last 50 times as long as the bulbs (WHO, 2013b).

The benefits of medical devices

Health professionals and workers rely on medical devices to provide effective preventive, diagnostic, therapeutic, and rehabilitative services. Medical devices are particularly critical to diagnosis first because so many diseases and conditions have similar characteristics and second, because early diagnosis facilitates the introduction of interventions that may either correct problems or prevent deterioration. Increasingly, policy makers recognise that key public health priorities cannot be achieved without appropriate and affordable medical devices. For example, at the 65th World Health Assembly in May 2012, multiple resolutions were adopted that acknowledged the requirement for medical devices to address the needs of ageing populations, and in the areas of maternal, new born and child health as well as non-communicable diseases (WHO, 2012b).

There is also mounting evidence that investing in medical devices reduces overall healthcare expenditure and contributes towards better patient outcomes. For example, a 2010 position paper by the Association of Healthcare Technology Providers for Imaging, Radiotherapy and Care (AXrEM, 2010) cites a study

(Beinfeld and Gazell, 2005) which examined how the use of CT and MRI scans influenced the cost of inpatient hospital care at a hospital in the US. The research concluded that diagnostic imaging costs were unlikely to be a dominant driver for hospital costs. Indeed, the study concluded that every \$1 spent on imaging correlated to approximately \$3 saved in hospital care costs (WHO, 2012a). Another study (Lichtenburg, 2009) used longitudinal state-level data to examine the effect of advanced diagnostic procedures on life expectancy and medical expenditure. States which spent more on quality diagnostic procedures had larger increases in life expectancy, but did not have larger increases in per capita expenditure. The author of the study speculated that this was due to newer diagnostic procedures, although being costly, reducing the need for even more expensive additional treatments.

Barriers to adoption in developing countries

Despite this evidence, there are many instances where medical devices are not being adopted in both high- and low-income countries, reducing patient access to quality care. In low-income countries, costs do pose a barrier. With limited funds available, some policy makers prioritise investment only in sectors such as defence and agriculture, failing to realise the economic ramifications of widespread poor health. For example, a study by researchers from Harvard University estimated that one extra year of life expectancy raises a country's per capita GDP by about 4 per cent (Bloom *et al*, 2003).

A lack of medical devices created or adapted specifically for low-resource settings is another factor hindering their more widespread adoption. Regulatory processes associated with medical devices often result in increased costs and delays, derailing some promising products. For example, on average in most countries it takes two years to get reimbursement for new medical devices in the regulatory environment. A process of harmonising regulatory requirements for medical devices across countries is needed to make it possible to test and deliver new technologies quickly and efficiently (WHO, 2012a). Added to this are issues of professional training to use these devices and factors such as erratic electricity supply.

Barriers to adoption in developed countries

Healthcare systems and policies in many developed countries are focused on the treatment of medical conditions after they occur, rather than on their prevention and diagnosis. Putting in place a variety of prevention, early detection, and wellness policies would result in significant gains in quality of life, workforce productivity and cost efficiency (ACCJ-EBC Health Policy White Paper, 2013). However, with spiralling healthcare costs, organisations are clamping down on spending. Healthcare budget holders in the developed world need to consider the total value that can be derived from their investment in the long term and how advanced technology can help contain costs.

Recommendations

A number of changes to the way healthcare is funded would help in addressing this situation in both the developed and developing world. Funding for prevention and diagnosis needs to be ring-fenced. Creating financial incentives in health insurance systems to motivate more people to undergo health risk assessments and to adopt healthier lifestyles long before the onset of illness would also help if more widely adopted globally. Furthermore, health insurance payment models should include some incentives to healthcare practitioners to keep patients healthy, for example, doctors could be offered larger payments for promoting prevention and early detection in their clinics (ACCJ-EBC Health Policy White Paper, 2013).

There are medical devices across the whole continuum of care that can make a difference to improving health outcomes. As a final recommendation, I would suggest that developed and developing countries review their three leading causes of death and work in collaboration with all stakeholders to map all the technologies and interventions required to improve the status quo.

It is clear that achieving current global health targets and goals will be impossible without building capacity and increasing access to essential medical technologies, both in the developed and developing worlds. A whole system approach is necessary to strengthen any healthcare system and make it more sustainable.

The public and private sectors need to work together to break down the barriers preventing greater adoption of these innovative technologies, across the whole continuum of care, and it is only then might we have a chance of addressing the great healthcare challenges we still face.

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