A digital (r)evolution: introducing The Lancet Digital Health

The digital future is rooted in our analogue past. It is therefore no surprise that The Lancet archives provide inspiration for this new journal’s first Editorial. A 1959 article describes the potential uses of a computer in health care and rather charmingly states, “If it be objected that the machine is doing no more than imitate the mental processes of the medical practitioner, it can be pointed out that the machine needs less training, and is subject to fewer aberrations, than the doctor.” Fast forward 60 years: although computers can be found in virtually every room of a hospital—and in every doctor’s pocket—technological advances in health care have not yet aligned with human expectations. In 2016, the World Economic Forum declared the exponential growth of digital technology as the “Fourth Industrial Revolution”, with the “potential to improve the quality of life for populations around the world”. However, many will argue that the revolution that digital technology has brought to other industries has not yet impacted our health to the same degree. Nonetheless, there is no doubt that digital technology is driving the evolution of health care.

The recent growth of digital technologies in clinical practice—by which we mean technology and data that inform medical practice and improve health—has been made possible by an exponential increase in computational power that has fuelled the generation and storage of complex data, including genomic sequencing and other so-called omics approaches, electronic health records, and medical imaging. Combined with the use of smart wearables and mobile phones, data from millions of individuals can be analysed with artificial intelligence techniques to support physicians in diagnosis and treatment of illnesses.

As a high quality, gold open access journal, The Lancet Digital Health will cover every aspect of digital health, with the aim of disseminating rigorous research to advance clinical practice and promote truly global change. In this issue, Daniel Ting and colleagues apply a deep learning algorithm trained on retinal fundus images from a multi-ethnic Singaporean cohort to diagnose diabetic retinopathy in a Zambian population. The potential clinical utility of deep-learning tools beyond their original application is consistently under question, and this work shows that artificial intelligence algorithms can be successfully deployed in a different population, with great potential to improve health care in low-income and middle-income countries.

Despite the promises of digital health, technical advances have so far outpaced the development of ethical and regulatory frameworks needed to ensure their appropriate implementation. This burgeoning new field requires scrutiny to ensure that technology supports physicians and health-care systems effectively, and, above all, does not compromise patient safety. Private industry is driving digital health transformation with few guarantees that digital tools are rigorously validated or meet patients’ needs, leaving academic communities, governments, and policy makers to determine how safety and efficacy should be demonstrated. In this issue, Eric Perakslis and Andy Coravos highlight this problem and call for patient data to be treated as “digital specimens”, afforded the same privacy as physical specimens. Likewise, Saira Ghafur and colleagues argue that health-care workers and the public require digital education and new skills for safer adoption of technology. Recent frameworks, developed by WHO and others, to formulate recommendations for scientifically grounded uses of digital health interventions, are a good start to support development of technology for clinical use. Threats to our health-care systems and personal privacy emphasise the need to bring together diverse communities to support the ethical and safe practice of digital health to keep the public at the heart of the revolution.

The Lancet Digital Health will guide the convergence of digital technologies and health to transform how we understand and treat disease, recognising that regulation for incorporating these technologies into our daily lives is paramount. Through our Editorial, Perspective, and Comment pieces, we aim to lead debate on practical digital approaches that balance benefits and risks of technology in health. By bringing together a globally representative and diverse audience, advisory board, authors, and reviewers, The Lancet Digital Health will prioritise the interdisciplinary challenges and opportunities facing digital health care. Finally, we aim to accelerate digital health research, informing changes to clinical practice and policy, to cement The Lancet Digital Health as an essential leader through current and future changes in health care.