2017 is the year healthcare goes sci-fi

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The start of a new year brings the ritual of setting goals and objectives for the year ahead. Those gathered from academia, industry, NGOs and government at this year's World Economic Forum Annual Meeting in Davos will seek to do just the same to tackle the world's most pressing issues.
In 2016 the theme was the Fourth Industrial Revolution and we discussed the impact of digital technologies such as the Internet of Things and artificial intelligence (AI). This year it is responsive and responsible leadership and, given the events of the year past, it is imperative that decision-makers work together to restore confidence in an open, equitable society.

More than ever, technology is at the heart of societal and business disruption. Each day we are presented with the immense opportunities that technological and business model innovations bring. We now

zoom in on how this affects employment, social cohesion and health. Digital technology will also be instrumental in tackling so many of the issues we face and, when addressed correctly, can offer new and better ways to care for each other, provide healthcare for billions who have no access today, and give us the tools to democratize medical knowledge.

MAKING HEALTHCARE TRULY ACCESSIBLE

Healthcare remains one of the bigger challenges, as it continues to demand a larger share of GDP in most societies, specifically those with ageing populations. Healthcare touches every individual and remains a hot political topic. The UK's National Health Service (NHS) was a major issue for Brexit voters and in the US the Accountable Care Act is under fire. Meanwhile basic care is not accessible to all and, where available, outcomes vary widely. It's clear that the current healthcare models that were shaped in the middle of last century are no longer effectively addressing the chronic care needs of today.

How can we make a difference to the lives of billions suffering from neurological disorders, diabetes, heart failure, lung disease and cancer? Technologies that were once the staple of science fiction movies are rapidly becoming realities. With increasing maturity of sensing and cloud technologies, we can integrate vast amounts of health and contextual data to give care professionals deeper and more predictive insights into someone's health. It allows us to bring healthcare to places where it was previously out of reach.

In India, for example, the lack of critical care facilities and personnel in remote areas of the country claims many lives every year. The answer to solving this problem is making the expertise of professionals available 24/7 and at scale, using remote telehealth technology, supported by algorithms that help identify patients in need of intervention. Large providers like Fortis Health and Manipal are successfully operating telehealth centers. We should embrace those practices and enable our systems with health data infrastructure and reimbursement models to scale connected care to all.

THE RIGHT INFORMATION AT THE RIGHT TIME

AI provides us with the opportunity to take major leaps in precision diagnosis and highly personalized treatment. We already have systems in production that can read and interpret large data sets of historic and current patient information from multiple sources. Information previously stored in silos, like studies, observations, tests, images and electronic medical records, can now be collated to become interoperable and understandable. AI can sift through thousands of academic papers in seconds. But what's more important, AI can help to deliver the right information at the right time within the right context - that of the individual patient. This helps to deliver first-time-right diagnoses on the way to more personalized treatment paths and reduce waste, all with the goal of improving outcomes. There are now more opportunities for doctors to remotely support patients. We are already using AI-based interactive voice and video-based monitoring technologies to remotely track physical and mental health. AI is used as a helpful tool to get quicker diagnosis and treatment for cancer by interpreting medical images, finding bio-markers on cancer tissues and performing DNA-analysis.
With the large scale deployment of medical record systems and the use of monitoring technology, the amount of data that health organizations collect is growing at exponential speed. The potential in utilizing this wealth of information to improve outcomes has still not been fully exploited. We are lacking feedback loops to turn every healthcare encounter from a contribution to knowledge. For example, applying the risk factors of breast cancer to detailed patient profiles, including attributes like family history or, even better, genetic information, will help us create more personalized programmes. We can create increasingly fine-grained profiles and perform more personalized screening programmes, which will lead to better outcomes and reduced costs. Every woman's case will help us further improve screening, detection and treatment programmes.

Smart devices and wearables (even ingestibles and implantables) play a part in creating access to healthcare. These devices augment their users and continuously collect health and contextual data, allowing healthcare providers to monitor patients anywhere, leading to more pro-active, personalized healthcare. Eventually, this data and their context can trigger alerts if there is a change in a combination of vital signs, indicating an emergency. Remote monitoring means fewer readmissions, quicker responses to emergencies and more immediate care to avoid deterioration or adverse events, such as stroke or falls. From the many studies conducted in different parts of the world it has become clear that connected care delivers better patient care at substantially lower costs along the full health continuum.

HAVE YOU READ?

And the possibilities don't just stop at AI and wearables. Philips coined the concept of ambient intelligence 15 years ago and now, with the Internet of Things, its time has come. Ambient intelligence refers to smart devices that are sensitive and responsive to their users and environment. Wireless technologies and smart environments will play a vital role in healthcare delivery by adapting to the needs of patients and giving the carers useful information on those patients.
Let me give you a potential use case: an elderly person at home wears a smart pendant which converses with her, reminds her of medication, prompts

her to eat and tracks her movement. Lights automatically come up when she gets up at night. When deterioration is noticed she will be connected to the right carer. In the case of a fall, emergency care is triggered and an ambulance sent to her home. The paramedics have full access to her medical history and the patient monitor they carry automatically configures to her specifics. Information is then sent to the hospital, where care is prepared. She will be automatically registered and monitored upon arrival, ventilation devices will automatically adjust and capture her vitals.

Such technologies and approaches promote clinical quality and efficiency of care, while sustaining a patient's independence and quality of life. Many of these technologies are not years away, they are already being used by millions. We need to further scale these successful models.
This isn't something that just western economies benefit from: our Philips Future Health Index found that a third of less developed economies (30%) already feel more comfortable than almost half (49%) of their developed counterparts with using connected technologies, where patients can engage with care professionals in alternative ways. This is referred to as leapfrogging, where remote and infrequent access to healthcare leads populations to find new and highly innovative routes around the problem by leveraging ubiquitous mobile infrastructure. With these technologies already in the hands of those in need, this is a very achievable goal for the future and could have a sizable impact.
Although there is no quick fix solution to health, I'm assured that by fostering open dialogue and collaboration that real progress can be made to bring these issues to the forefront and to ultimately make 2017 a revolutionary year for connected care. We have a responsibility to those around us and we must make sure that everyone benefits from the amazing opportunities of digital technology, leaving no one behind on the journey to realizing digital maturity.

SAMENVATTING

Technologie is het middelpunt van maatschappelijke en zakelijke ontwrichting. We worden dagelijks geconfronteerd met de enorme hoeveelheid technische mogelijkheden. Welk effect heeft dit op werkgelegenheid, sociale cohesie en gezondheid? Digitale technologie zal ook een hulpmiddel zijn bij het oplossen van veel hedendaagse problemen en kan zorgen voor betere zorg voor elkaar, en voor de miljarden mensen die nu geen toegang hebben tot de zorg.

Gezondheidszorg blijft een van de grotere uitdagingen. Het vraagt een steeds groter deel van het BNP en raakt ieder individu. Het is duidelijk dat de huidige modellen die halverwege de vorige eeuw zijn gemaakt niet toereikend meer zijn voor de chronische zorg van vandaag. Dus hoe kunnen we een verschil maken in het leven van miljarden die lijden aan chronische aandoeningen? Met sensor- en cloudtechnologie kunnen we over grote hoeveelheden data beschikken die zorgprofessionals een dieper inzicht en een beter voorspellend vermogen geven in iemands gezondheidstoestand. Het geeft ons ook de mogelijkheid om gezondheidszorg te brengen naar plaatsen die voorheen buiten bereik lagen door gebruik te maken van e-health-oplossingen en algoritmes die patiënten identificeren die interventie nodig hebben.

Kunstmatige intelligentie geeft ons de mogelijkheid om grote stappen te maken in precisiediagnose en persoonlijke behandelingen. We hebben nu al systemen die enorme datasets kunnen interpreteren en kunstmatige intelligentie kan ons helpen om de juiste informatie op het juiste moment te hebben in de juiste context. Hiermee kunnen we first-time-right diagnoses leveren op eg naar een meer gepersonaliseerde behandeling, waarmee we betere uitkomsten hebben tegen lagere kosten. Er zijn steeds meer mogelijkheden voor artsen om patiënten op afstand te helpen.

Dit is niet enkel iets waar westerse economieën profijt van hebben. Onze *Philips Future Health Index* heeft uitgewezen dat juist minder ontwikkelde economieën zich meer comfortabel voelen met het gebruik van verbonden technologieën. Wij hebben de verantwoordelijkheid om ervoor te zorgen dat iedereen kan meeprofiteren van de fantastische mogelijkheden van digitale technologie.