

Machine Learning Can Fix How We Manage Health on a Global Scale

(The second article in a series relating to Artificial Intelligence. Written by Peter Piot for Wired UK Magazine)

Unleashing the power of machine learning and artificial intelligence (AI) is a major ambition for medical practitioners and the healthcare industry. If these two can come together on a global scale in 2019, with the proper investment and the right approach, AI could propel a revolution to democratize global health and to leapfrog access to health services in low- and middle-income countries.

A chronic shortage of human resources is one of the major obstacles to better health and healthcare in many resource-poor settings. When it comes to global health, artificial intelligence offers huge opportunities to fill the gap left by critical healthcare worker shortages, particularly if combined with mobile phone technology. With the rise of chronic conditions in nearly all countries, a growing elderly population and stretched health services, empowering patients to help prevent disease makes a lot of sense.

While there is a wealth of innovation going on in health in the context of AI, there is not enough evaluation and validation as to whether these new technologies actually improve health at all. Such evaluations should be a priority for health research funders.

To make sure new technology and digital health solutions can be accessed by all – not just the wealthy – and address both infectious and non-infectious disease, it is critical that there is a coordinated approach to their evaluation and delivery. However, the rules are not fully defined for machine learning and artificial intelligence in healthcare, which risks undermining trust and success. We therefore need to make sure that we are delivering innovation for social impact, but also that we are innovating the ways in which we deliver innovation, with the appropriate governance and regulatory frameworks to ensure equitable access and impact.

As scientists we are reliant on data and the same principles of robust data collection and analysis should apply to machine learning solutions, ensuring that these data are used ethically and that patient privacy is protected. Health apps and medical digital innovation also needs clinical validation and rigorous grass roots development and distribution. This is where the source is also crucial – bias embedded in the model can generate new data that reinforce bias. So we need to make sure that data are collected in a way that reflects our diverse societies, and that local context is built into new technology and innovation.

Looking to the future, we must not repeat mistakes of the past, as happened in Africa in the 1990s, when large-scale interventions for HIV/AIDS relied on western understandings of the epidemic, and subsequently failed. Low and middle-income country partners must lead the way in shaping the technological innovations which could make the greatest difference to health among their own populations.

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In Brief...

- ◆ U.S. wholesaler and distributor **Cardinal Health** reported second quarter fiscal year 2019 revenues of US\$37.7 billion, up 7% year-over-year. Growth was attributed to sales growth from pharmaceutical specialty distribution customers, however this was partially offset by the divestiture of the company's China distribution business, according to the company. Second quarter profit decreased 14% due to negative performance of the company's generics program partially offset by specialty solutions performance. Second quarter revenue for the medical segment also decreased by 1%, primarily driven by the divestiture of the China distribution and naviHealth businesses.

- ◆ **GlaxoSmithKline** is returning to the oncology arena with an upfront payment of US\$4.18 billion to **Merck KGAA** for access to its bifunctional immunotherapy, *M7824 (bintrafusp alfa)*. The drug has been tested in over 700 patients with 10 different types of tumors. Eight "high priority clinical development" non-small cell lung cancers (NSCLC) and biliary tract cancers. These include a Phase II study to investigate *M7824* compared with Merck & Co., Inc.'s *Keytruda*, a market-leading checkpoint inhibitor in the treatment of patients with PD-L1-expressing advanced NSCLC.

- ◆ **BAHEAL Pharmaceutical Group** (BPG) and U.S. medical device manufacturer, **AtriCure**, have joined forces in the form of a strategic cooperation agreement in the treatment of atrial fibrillation (AF). **Qingdao BAHEAL Pharmaceutical Holdings Limited**, a BPG subsidiary, will become an exclusive agent and distributor of AtriCure's medical devices for AF ablation in China, serving over 10 million Chinese patient suffering from the disease. BPG is also maintains strategic cooperation agreements with several other companies, including IBM, Oracle, Philips and others.

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Zuellig Pharma CEO John Davison Joins IFPW's Board of Directors



Zuellig Pharma CEO John Davison has been appointed to the IFPW Board of Directors for the 2018-2020 term.

John has over 30 years of experience leading start-ups, turnarounds, and M&A across a range of industries including consumer products, technology and retail.

A graduate of Cambridge University and Harvard Business School, John has served in a number of high profile positions with companies such as Marks & Spencer, McKinsey, Grand Met/IDV and Guinness. Prior to joining Zuellig Pharma, John was President of Danone's Dairy Division in Asia, the Middle East and Africa. He also serves on the the Advisory Board of the Lee Kong Chian School of Business at the Singapore Management University.

John will also serve on the Board of Trustees for the IFPW Foundation.

Machine Learning (cont.)...

Home-grown solutions like the mPedigree Network, founded in Ghana by Ghanaian Bright Simons, is an innovative end-to-end mobile tracking system that empowers patients and health professionals to identify counterfeit medicines by strengthening the authenticity of supply chains of medical products, including vaccines. With Google opening an AI lab in Ghana and dedicated education programmes launching in Africa to harness local skills, hopes are rightly high that this trend will continue apace in 2019. And crucially, rigorous evaluation and scrutiny must be applied to AI solutions to ensure the quality and safety standards are in place and that the shift in personalising healthcare for all is an unquestioned force for good.

With that in mind, public-private partnerships will be strengthened in 2019 to create a suite of robust, effective and equitable digital solutions. These will harness the power of AI to democratise patient power and people's ability to manage their own health, including in low and middle-income countries.

Investors Focused on Expectations at the 2019 JP Morgan Healthcare Conference

(Source: Scrip)

Investors and attendees at this year's 2019 JP Morgan Healthcare Conference were focused on the issues and challenges currently facing drug makers, including mergers and acquisitions, changes in tack, and guidance on 2019 earnings. Manufacturers such as Pfizer, Merck, Amgen, Allergan, and Biogen all presented their insights and perspectives on how the pharmaceutical industry has fared in the past twelve months and its direction in the future.

Pfizer's new CEO, Albert Bourla, highlighted the company's one new commercial opportunity, *tafamidis*, which is used in the treatment of the rare and fatal heart condition of transthyretin amyloid cardiomyopathy. The drug is currently awaiting FDA approval which is expected in July of 2019. No significant changes in the direction of the company's focus is expected near term, and there is expected near-term growth as the company's late-stage pipeline continues to mature.

Merck's PD-1 inhibitor *Keytruda* (*pembrolizumab*) continues to dominate Bristol Myers Squibb's *Opdivo* (*nivolumab*). Both are used in the treatment of non-small cell lung cancer. *Keytruda* began to take over *Opdivo*'s market share last year and its success is in contrast to Bristol's setbacks with *Opdivo*. While Merck's late-stage pipeline remains thin, it has several growth drivers including its largest, *Keytruda*, as well as HPV vaccine *Gardasil*.

Amgen Inc. is preparing for biosimilar competitors for many of its top-selling products for the over past five years and 2019 will provide the company with the opportunity to showcase how its cost-cutting and reinvestment opportunities have paid off. Amgen CEO, Robert Bradway, spoke about current threats to the company neutropenia and anemia franchises, both under pressure due to biosimilars either already currently on the market or coming to market near-term. Also facing multibranded competitors is the TNF inhibitor *Enbrel* (*etanercept*). Investors look for Amgen to execute deals that will add revenue-producing products to its portfolio.

Investors were also focused on generic competition facing Allergan's blockbuster drug *Restasis* and the performance of *Botox* in both therapeutic and aesthetic uses. The patent cliff for *Restasis* is fast approaching but others see continued optimism concerning

Restasis's market share. Leerink's Marc Goodman predicts US sales of *Restasis* reaching nearly US\$1.19 billion but bottoming out at US\$77 million by 2023. However, Goodman stated that "the underlying growth of [Allergan's] base business is underappreciated by investors and is driven by three franchises (medical aesthetics, emerging markets and Fralzar)." He also predicted that Allergan's share of the business contributed by "durable assets" will rise over the next five years to 60%.

Analysts' expectations for Biogen going forward into 2019 are on hold. Contributing to the company's growth will be the antisense therapy *Spinraza* (*nusinersen*) used in the treatment of spinal muscular atrophy. However, important Phase III results on trials in Alzheimer's Disease for its highly-anticipated anti-amyloid-beta candidate *aducanumab* are not expected until 2020. There could be an interim analysis in March of 2019, but the company has been silent with regard to providing information before the full-trial read-out. Analysts at Jefferies noted that "the market continues to wait on M&A which has been consistently talked about for 12+ months," while pointing out that Biogen has "strong balance sheet capacity."

Investors are looking to Novartis to have impressive revenue growth going forward due to a number of factors, including continued strong performance of *Cosentyx* (*secukinumab*) used in the treatment of psoriatic arthritis and ankylosing spondylitis. However, observers will also be interested to the effect of the success of Johnson & Johnson's IL-23 inhibitor, *Tremfya* (*guselkumab*), in beating Novartis' IL-17A inhibitor in the Phase III ECLIPSE study, although Novartis does have long-term safety and efficacy on its side.

A successful launch of Roche's hemophilia product, *Hemlibra*, and a continued strong ramp-up of *Ocrevus*, used in the treatment of multiple sclerosis, are expected to offset European competition for *Herceptin* and *Rituxan*. Investors are focused on the company's biosimilar entries, due in part that the company makes more than 80% of its sales from biologics.

In Brief (cont.)...

- ◆ Japanese distributor **Nippon Express** will make a full-scale entry into the logistics business for domestic drug manufacturers by investing in four major drug distribution centers in country that will comply with international quality control standards. Operations will begin next year and aim for annual sales of US\$1.35 billion. Locations include Osaka Prefecture, Fukuoka Prefecture, Toyama Prefecture and Saitama Prefecture.

- ◆ **111, Inc.** announced that it has signed a strategic cooperation memorandum of understanding with **Eli Lilly & Co.** to roll out a "fourth sales channel" solution for pharma companies that will focus on big data, e-prescriptions, doctor services and patient education. Both parties will also jointly develop innovative online medical insurance and pharmacy benefit management models. According to the agreement, Lilly will leverage 111's cloud-based solutions.

- ◆ **Sanofi** CEO **Olivier Brandicourt** has been named as chairman of the **Pharmaceutical Research and Manufacturers Association (PhRMA)**. He succeeds **Robert A. Bradway**, chairman and CEO of **Amgen**. **Bristol-Myers Squibb** chairman and CEO, **Giovanni Caforio**, was appointed chairman-elect, and **Eli Lilly** CEO, **David Ricks**, assumed the post of board treasurer.

(Sources: Company Press Releases, Drug Store News, Global News Wire, Pharma Japan and Scrip)