pharmaphorum deepdive

Digital Heatlh 2022

December 2022

Unlocking the promise of patient support programmes in oncology

The rise of the healthcare influencer

Measuring the cost-effectiveness of vaccines targeting infectious diseases

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Deep Dive: Digital Health 2022

Over the past two years, surging interest (and subsequent investment) has propelled us into a new era of healthcare. While the tide may be turning for investors looking to recover market stability after the unprecedented turbulence of 2021, the innovations emerging from the digital health sector look set to drive further transformation moving into 2023 and beyond.

The question now is, what does the future of digital health look like outside of the COVID-19 bubble?

One clear guiding light here is the commitment to patients. As digital technologies continue to transform what is possible to achieve in the healthcare industry, digital innovators are beginning to view their work through a public health lens as well. It's easy to get caught up in the excitement of next-generation technologies. But if these tools fail to empower patients, champion usable, efficient, and secure patient data access, and provide broader digital health literacy, they are likely to fall behind competitors.

Realising the potential of digital health was the focus of this year's Frontiers Health conference, hosted by Healthware International in Milan. In this issue of Deep Dive, we bring you the core highlights from the event, plus backstage interviews with digital health innovators.

Also, in this issue, Vinehealth discusses how patient support programmes can help drive behaviour change for oncology patients, Research Partnership explores the rise of healthcare influencers and how to engage with them effectively, and Viseven details the importance of adding modular content to your omnichannel communications toolkit.

Plus, ICON examines the cost-effectiveness of vaccines targeting infectious diseases, Syneos Health and VBI Vaccines explain how they delivered a new kind of partnership model, and we find out how and why AstraZeneca launched a truly patient-focused healthcare innovation hub.

For all this and more, read on.

See you in 2023!

Eloise

Eloise McLennan – editor, Deep Dive

Next issue:
Research & Development 2023
Plus:

- Rebuilding the clinical trial landscape
- Best practice in R&D innovation

Catch up on recent issues:

Patients & Partnerships – October 2022

Communications & Commercialisation – September 2021

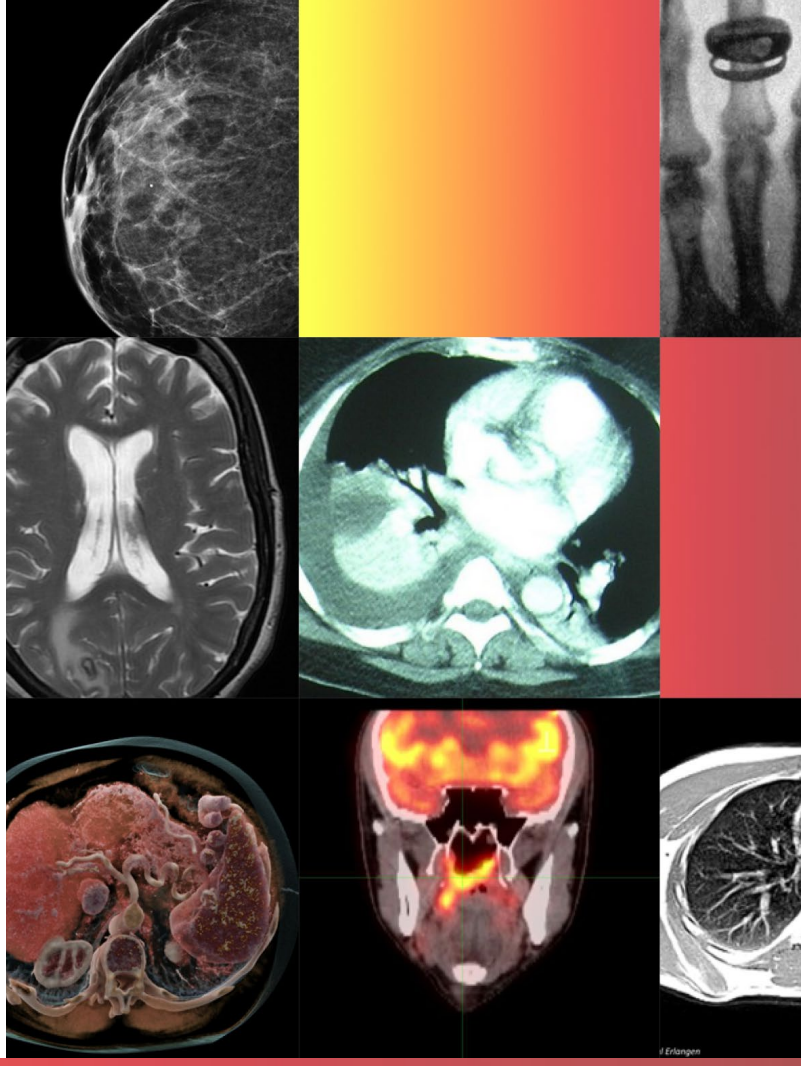
Oncology – June 2022

Market Access – May 2022

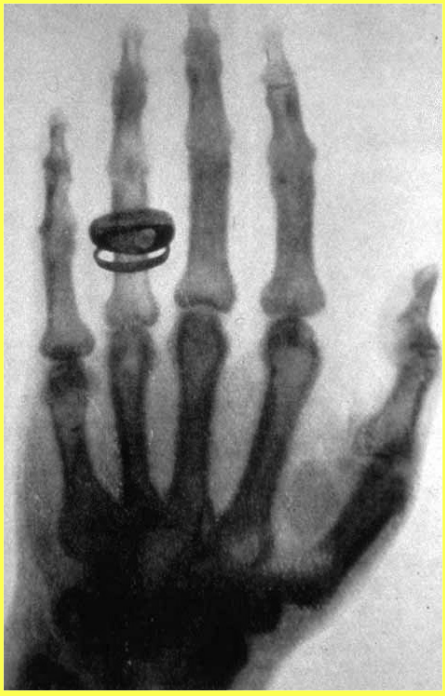
Timeline: a history of medical imaging

Today, medical imaging technologies such as X-ray and MRI machines are so ubiquitous across healthcare settings that it is difficult to imagine a life without them. The contributions of these machines and techniques to the advancement of medicine is undoubtable, from the early days of the humble microscope to the futuristic possibilities of patient-specific 3D modelling, the history of medical imaging is both rich and eventful.

As we look ahead to another year of innovation and developments yet to come, we remember the dedicated few who proved that medicine is more than skin deep, by providing an ever-deeper view into the human body.



1895



Wilhelm Roentgen accidentally discovers X-rays

Although early references to what we now understand to be X-rays can be traced back to 1785, when the 'father of modern actuarial science' – Welsh physician, physicist, and statistician, William Morgan – recorded an "invisible light", produced when a current is passed through an experimental discharge tube. But it wasn't until 1895 that this radiation would be given its famed moniker: X-rays.

Wilhelm Röntgen; current version created by Old Moonraker., Public domain, via Wikimedia Commons

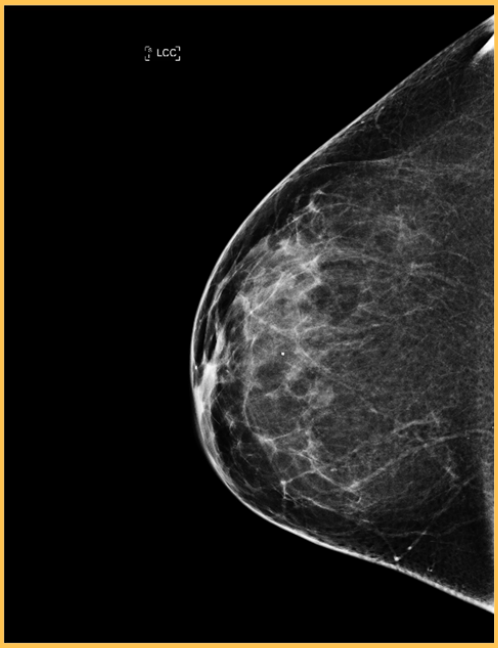
Official discovery of X-rays is commonly attributed to German physics professor, Wilhelm Roentgen, who – somewhat accidentally – stumbled across the radiation while testing to see whether cathode rays could travel through the glass of Lenard and Crookes tubes. There is some debate as to the specific details of the discovery, as Roentgen instructed that his lab notes be burned upon his death, however, the likely story presented by his biographers is that, during one such experiment, Roentgen noticed that an unidentified ray was escaping from beneath the black cardboard covering his cathode tube, causing a nearby fluorescent screen painted with barium platinocyanide to glow green.

Roentgen dubbed the unknown rays "X" and quickly threw himself into uncovering their scientific secrets. Two months later, he submitted the first paper written on X-rays and submitted it to Würzburg's Physical-Medical Society journal.

Following his initial discovery, Roentgen went on to identify their potential medical use when he used X-rays to form a picture of his wife's hand on a photographic plate. It was the first photograph of the human body to be captured using the technique.

Understandably, news of his discovery sent shockwaves across the medical field, and soon physicians around the world were using X-rays to locate injuries, fractures, and foreign objects in the patients. For his work, Roentgen was awarded the Nobel Prize in physics in 1901.

1913



Credit: National Cancer Institute, National Institutes of Health

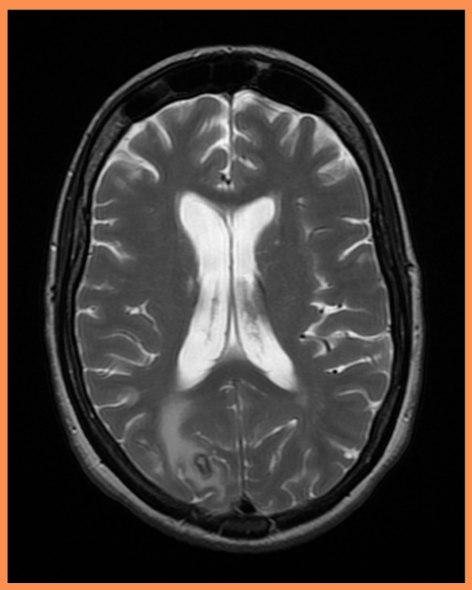
Albert Salomon and the mammogram

Little over a decade after Roentgen received the Nobel Prize, German surgeon Albert Salomon would leverage the capabilities of X-ray imaging to perform his inaugural mammography study. In what would go on to form the foundation of the mammography, Saloman analysed 3,000 mastectomies, where he compared X-rays of breasts to the actual removed tissue, specifically observing microcalcifications.

Through his research with X-ray imaging, Salomon established a difference between cancerous and non-cancerous tumours in the breast. Moreover, he identified the existence of multiple types of breast cancer.

Despite publishing his findings in 1913, patients would have to wait more than 50 years for the clinical use of mammography as a screening tool to become widespread.

1938-1946



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Nuclear Magnetic Resonance emerges

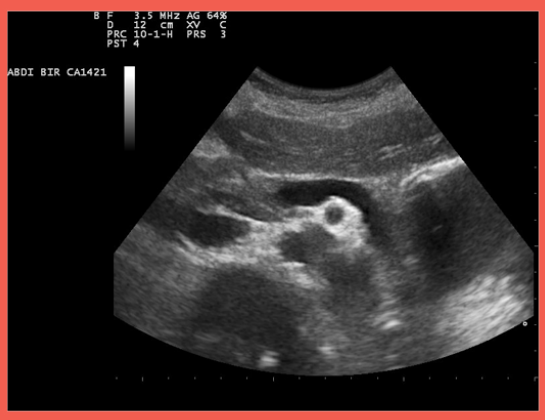
Early descriptions of nuclear magnetic resonance can be traced back to the work of American physicist Isidor Isaac Rabi in 1938, when he demonstrated that molecular beams could be made to emit radio waves at specific frequencies when passed through a magnetic field – a feat for which he was awarded the 1944 Nobel Prize in Physics.

After independently discovering nuclear magnetic resonance using different instrumentation and techniques, in 1946 American physicists Edward Purcell and Felix Bloch expanded the technique for use on liquids and solids.

In 1952, Purcell and Bloch were jointly awarded the Nobel Prize in Physics for 'their development of new methods for nuclear magnetic precision measurements and discoveries in connection therewith'.

While they could not have known it at the time, the work of Rabi, Purcell, and Bloch would become the foundation of a technique that would transform modern healthcare delivery: Magnetic Resonance Imaging.

1955



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Discovery of ultrasound for medical diagnosis

The principles of echolocation first identified in 1794 by Italian biologist Lazzaro Spallanzani informed the foundation of today's ultrasound technology.

Having developed an interest in the possibilities of adapting radar and sonar technology for medical use during the Second World War, Scottish physician Ian Donald began to explore the use of ultrasound to diagnose gynaecological patients. Ultrasonic waves had previously been noted for their use in detecting brain tumours by neurologist

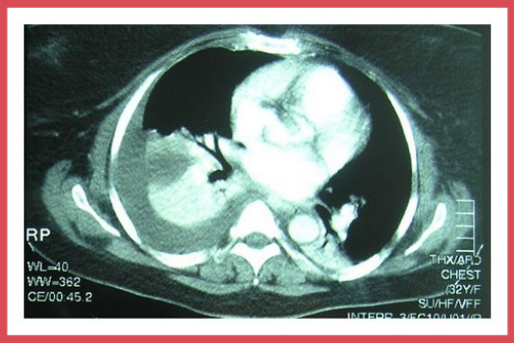
Karl Dussick in 1942, however, the use of ultrasound as a diagnosis tool in gynaecology was, at the time, an unknown.

It was during his tenure as professor of regius midwifery at Glasgow University when Donald began to work with T G Brown (a research engineer with from the scientific instrument makers Kelvin & Hughes) to create the first diagnostic ultrasound machine.

In 1956, they were joined by obstetrician John MacVicar and together the team worked to determine the causation behind certain images produced by the scan. Through their research, they identified that an ovarian cyst would result in a clear gap in the image, as well as investigating the shapes of images in the presence of uterine fibroids.

In 1958, Donald, Brown, and MacVicar published their findings in The Lancet.

1967



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Godfrey Hounsfield introduces the CT scan

The concept of tomography was initially introduced in the early 1900s by the Italian radiologist Alessandro Vallebona, however, the use of radiographic film to see a single slice of the body was considered ineffective when it came to capturing soft tissues or larger areas of the body.

The limitations of tomography would continue to impede clinicians until 1967, when Godfrey Hounsfield, an English electrical engineer, and South Africa-born physicist Allan Cormack conceived the idea for the first computed tomography scanner.

Originally, the system focused on head imaging only. In contrast to the highspeed data collection possible with today's CT imaging, the first scanner developed by Hounsfield and his team at EMI Laboratories in England took several hours to acquire the raw data for a single scan, followed by days of work to reconstruct a single image from this data.

In 1971, the first patient brain CT scan was performed at Atkinson Morley Hospital in Wimbledon, England.

1977-1984

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Rise of the MRI body scan

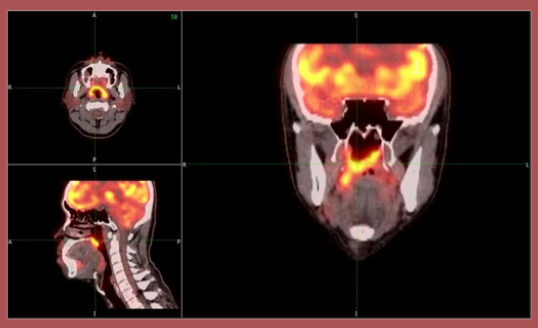
A decade after the first CT scan was recorded in England, Armenian-American doctor and professor at the Downstate Medical Center State University of New York, Richard Damadian, along with Larry Minkoff and Michael Goldsmith, performed the first MRI body scan of a human being.

Their work built upon research from the American chemist Paul Lauterbur. In 1973, Lauterbur developed a way to generate the first MRI images, in 2D and 3D, using gradients.

Across the Atlantic, at the University of Aberdeen, a team led by John Mallard was set up to build the first full-body MRI scanner. In August 1980, the scanner was used to obtain the first clinically useful image of a patient's internal tissues using MRI, which identified a primary tumour in the patient's chest, an abnormal liver, and secondary cancer in his bones

It would take a further four years for regulators to give the technology the green light; the US Food and Drug Administration approved the device in 1984.

2018



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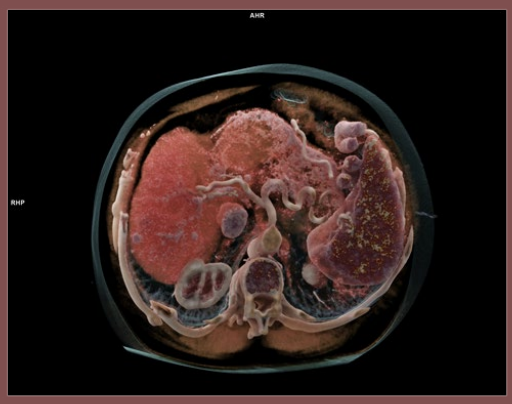
Total Body PET scanner introduced

Scientists at the University of California-Davis announced the creation 'EXPLORER', claimed to be the world's first medical imaging scanner that can capture a picture of the whole human body at once.

EXPLORER is a combined positron emission tomography (PET) and X-ray CT scanner. Led by scientists Simon Cherry and Ramsey Badawi, the team reported that the scanner captured radiation more efficiently than others, which allowed it to produce an image in one second, dramatically reducing the time required for scans.



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A new era of imaging

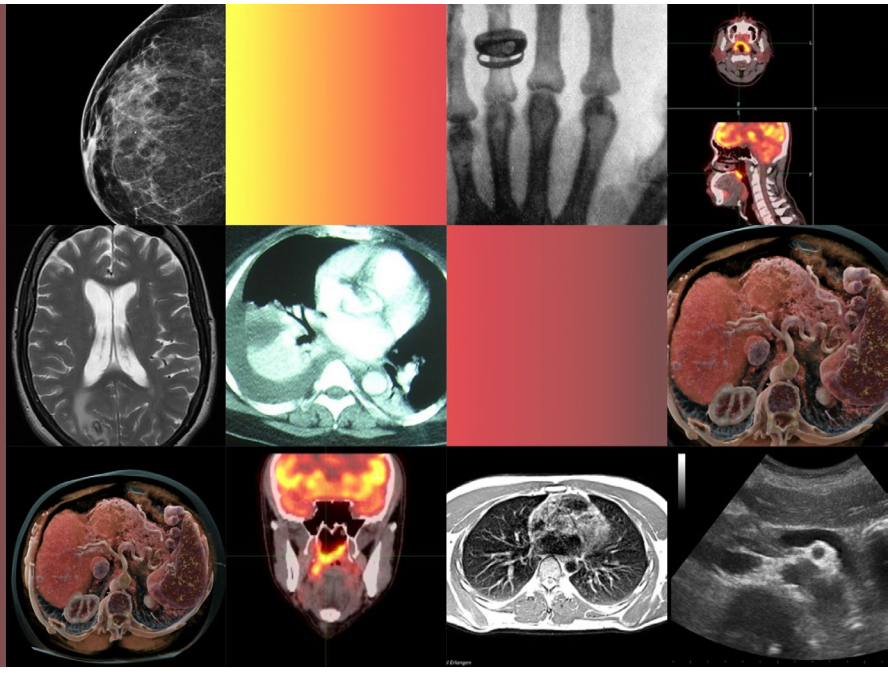
In late 2021, Siemens Healthineers introduced the world to the first photon-counting CT scanner. The scanner, dubbed Naeotom Alpha, aimed to address limitations in conventional CT scans.

To achieve this, the team behind Naeotom Alpha developed a new detector material: high-purity cadmium telluride (CdTe) crystals. According to Siemens Healthineers, these crystals deliver the highest spatial resolution of any CT imaging system to date and enable pixels nine times smaller than used in conventional CT, without any dose penalty.

With spectral imaging, clinicians can differentiate between calcifications, stents, vessel walls, and contrast media, thereby increasing diagnostic efficiency.

About the author

Eloise McLennan is the editor for pharmaphorum's Deep Dive magazine. She has been a journalist and editor in the healthcare field for more than five years and has worked at several leading publications in the UK.



Frontiers Health 2022 – a digital mixture of start-ups and life sciences in Milan

As the healthcare industry emerges from the COVID-19 pandemic into a new, digitally supercharged world, stakeholders across the industry are moving fast to embrace digital transformation. Against this backdrop of innovation, Frontiers Health 2022, held at the Palazzo del Ghiaccio in central Milan, brought together thought leaders and industry experts from across the life sciences to discuss the future of digital health.

Attendees were both on site and remote, able to follow the global conference – Frontiers Health's seventh event – from far and wide online, and discussions covered the future of digital therapeutics: improving patient and provider workflows, standardising definitions and regulatory schemes, and focusing on patient experience.

The conference also showcased advances in digital care delivery and telehealth, while diving into the realities of 'hospital at home' offerings and the opportunities created by real-world evidence (RWE) from sensors and connected devices. Other additional focus areas included digital health funding, scaling, and business models, as well as digital public health and taking innovation inspiration from outside of the healthcare industry.

Healthware Group's CEO and founder Roberto Ascione, together with WTF Health's founder and host Jessica DaMassa, formally opened the event, centred in the main hall for Day One, while Day Two spread out from the central hall to multiple rooms and tracks, and also held some purely virtual events, including the fireside chat 'Shaping the future of healthcare with telemedicine', moderated by Ascione.

The enduring value of healthcare, and its present challenges

DaMassa was later joined by Glen Tullman, CEO of Transcarent, for a fireside chat on whether healthcare or digital health are in a bubble, with Tullman explaining that there's a difference between valuations and value. Healthcare costs, he said, will keep getting higher and it's becoming difficult to pass on those costs to the consumer. What the pandemic brought, besides tragedy for so many, was the lesson that digital health works at scale, and the future of healthcare will be one much more directly accessible to the consumer than it is today.

Scaling DTx and united policies

A panel moderated by Digital Therapeutics Alliance's chief policy officer Megan Coder on digital health and European healthcare systems began with that question of scale, but what exactly does it mean to say that DTx has scaled? To this, Big Health's Peter Hames replied that one aspect of scale is working with a major organisation, such as the NHS, which automatically connects you to a large group of patients.

General manager at Ethypharm Digital Therapeutics, Hélène Moore, said that scaling has become a buzzword in DTx because disparate systems make it so difficult to roll out broadly, and Aptar Digital Health's Pierre Leurent claimed scale to be a relative thing, as different conditions have different sized populations, and noted the need for more harmonised standards, such as were to be discussed at Day Two of the conference, regarding the European DTx Policy Coalition.

Also on the panel was Healthware's Alberta Spreafico, who mentioned that government policy can be guided by internal industry standards, so HCPs can help by aligning on their own internal policies and definitions. To this, Moore explained the importance of clear and illustrative case studies; helping people to understand what DTx are, how they work, and their potential benefits. The time, after all, is ripe: most governments and policymakers are in a period of change around digital health policy at the moment.

How advanced telehealth will scale and advance healthcare in emerging markets

Continuing with the theme of scalability, Taliossa's Tony Estrella-led panel, 'Beyond video visits', had the moderator invite discussion on the promise and meaning of having an effective telehealth channel that is delivered at scale to effect change in people's lives, particularly in emerging markets.

Praava Health's Sylvana Sinha spoke of the Bangladeshi experience – where there are 400k patients without equity – and how her mother's own health crisis whilst in the country for a family wedding prompted her to create Praava Health to offer an end-to-end solution and make a difference to people's lives there. Meanwhile, Rachel Frizberg of biotech Roche explained one of the company's core values is about reaching all the patients across the globe, not just key development markets, and mentioned its 'Mission Leapfrog' for creating sustainable healthcare systems in such places as the Philippines, where often breast and cervical cancers are treated far too late.

Altibbi's Jalil Allabadi also raised the question of affordability and how the company's telehealth solutions provide access to primary care for just $5 a month in certain parts of the world, and Estrella brought the conversation back round to partnership and how that can be achieved with larger organisations, including going direct-to-consumer in the first instance.

Shaping the future of healthcare with telemedicine; barriers to digital health adoption

A virtual fireside chat with Healthware Group's CEO, Roberto Ascione, saw with him Teladoc Health's CEO, Jason Gorevic, and president of international at Teladoc Health, Carlos Nueno. The three discussed transformative technology in telemedicine and how it is shaping the future of health overall, including quality, reimbursement, access, and cost. With increasing consumer demand for speed in delivery, telehealth is more than a video visit: it breaks down silos between physician appointments.

Meanwhile, Richard Secker-Johnson of ZS Associates informed his audience that a recent survey by the company had found that 70% of HCPs still cite digital health literacy as the greatest barrier to its adoption. Other hurdles include engagement, patient empowerment, and last-mile deployment. With Secker-Johnson were Malin Johansson, global head of digital health partnership at Novo Nordisk, and Saemundur Oddsson, chief medical officer at Sidekick Health. All agreed, transparency is key.

Precision health: it takes an ecosystem

The virtual keynote from Dr William Marks of Verily Life Sciences – which began life as a Google Moonshot – took talk away from scalability to focus not just on the company's key mission of precision health, including early detection, personalised treatment, and smarter deployment of resources at the systems level, but on the idea of better measurements.

"We are still stuck in a very crude world of measurement," he said. "Sure, we have lab tests that can measure blood counts and ECGs that can measure cardiac cycles. But in so many areas of care, the measures we have are very subjective. We tend to interact with patients in a tiny snapshot of their health, and that often leads to a delay in the detection of conditions that could be managed much better if caught earlier."

Verily itself is exploring sensor-based measurement with its Verily Study Watch – which uses the Digital Medicine Society's V3 framework to evaluate whether biomarkers are useful and fit to purpose.

"It [takes] an ecosystem and a variety of capabilities to move us towards precision health," he said.

A new frontier in mental health: psychedelic therapies, past, present, and future

Also changing the scene are developments in mental health. An important space in the field, mental health disorders affect everyone in some way; everyone has a story, oftentimes unspoken. Yet, there's still a lot more to do. A COMPASS Pathways-sponsored symposium looked at psilocybin.

Used for millennia in a folk capacity and researched during the 1950s and 1960s until put on hold for various reasons – now that research on psilocybin is starting to recommence. Why? Because we are in a mental health crisis, and very little is working. In short, we need new paradigms.

Moderator of discussions Marco Mohwinckel was joined by David Erritzoe, Walter Greenleaf, Sahil Kirpekar, Greg Ryslik, and Metten Somers. The latter stated that there's a lot of attention on the psychedelic renaissance and that these therapies might, in the future, be part of our normal healthcare – but more evidence is still needed. A phase 3 trial needs to be tested, but patient recruitment is difficult.

Additionally, Mohwinckel noted the importance of psychological support, with patients needing to be prepared for the psychedelic experience: it's not just about taking psilocybin and sitting there, waiting for something to happen. Therapists have to be trained in the NLP Model that data is run through. It is personalised medicine.

Walter Greenleaf's focus is VR and AI. Such immersive technologies can train therapists in dealing with patients who have a negative experience with psilocybin. Kirpekar admitted very few pharma companies have successfully moved into service providing in the mental health area.

This series of sessions also included a conversation between Eugene Borukhovich and Kabir Nath. Borukhovich stated that he'd recently learned that psychology therapy works backwards. Mental illness is a huge issue and biological markers still haven't been found that will help. Nath noted the complex journey for patients with treatment-resistant depression and asked how the chasm can be crossed and psychological support be scaled.

No psychedelic is going to be a panacea and digital markers are going to be relied on more than genetic or genomic markers when it comes to treatment: that is to say, big data sets, relationships between symptoms, and other parts of people's personal activity.

Digital therapeutics and mental health; AI and genomic medicine

Monique Levy of Woebot Health discussed the concept of a therapeutic alliance, and digital therapeutics' place therein, to a point where, like drugs, they are prescribed in certain dosages – especially when it comes to treating mental health problems. With the market for empathic technologies exploding, Levy also admitted the world is not necessarily ready, and that the question arises, also, over data privacy.

Meanwhile, Robert Konrat of Max Perutz Labs admitted an ignorance when it comes to digital tech healthcare, at the same time stressing the need for new research initiatives to exploit the massive amounts of data, so as to produce knowledge. Ranging from biochemical pathways linked together to form a phenotype, to the predictive possibility within the distance between two pathways and how WORD2Vec language analysis – working on the basis of semantics – can rotate scientific data when looking at predictive drug and disease relationships – he proposed a semantic information bank on biology, with patients as citizen scientists within the biomedical arena.

Digital health strategies in dynamic & uncertain markets: forward glancing

Frontiers Health 2022 closed with Kristin Milburn of Healthware Labs moderating a panel on digital health strategies in both dynamic and uncertain markets. Research2Guidance's managing director Ralf Jahns noted that there are several approaches to digital health innovations: central units, decentralised teams, partner ecosystems, and business carve-outs. Equally, he said that every digital health company needs continuous market monitoring, an entrepreneurial team, a strategic roadmap, a clear value proposition for partners, and access to funding.

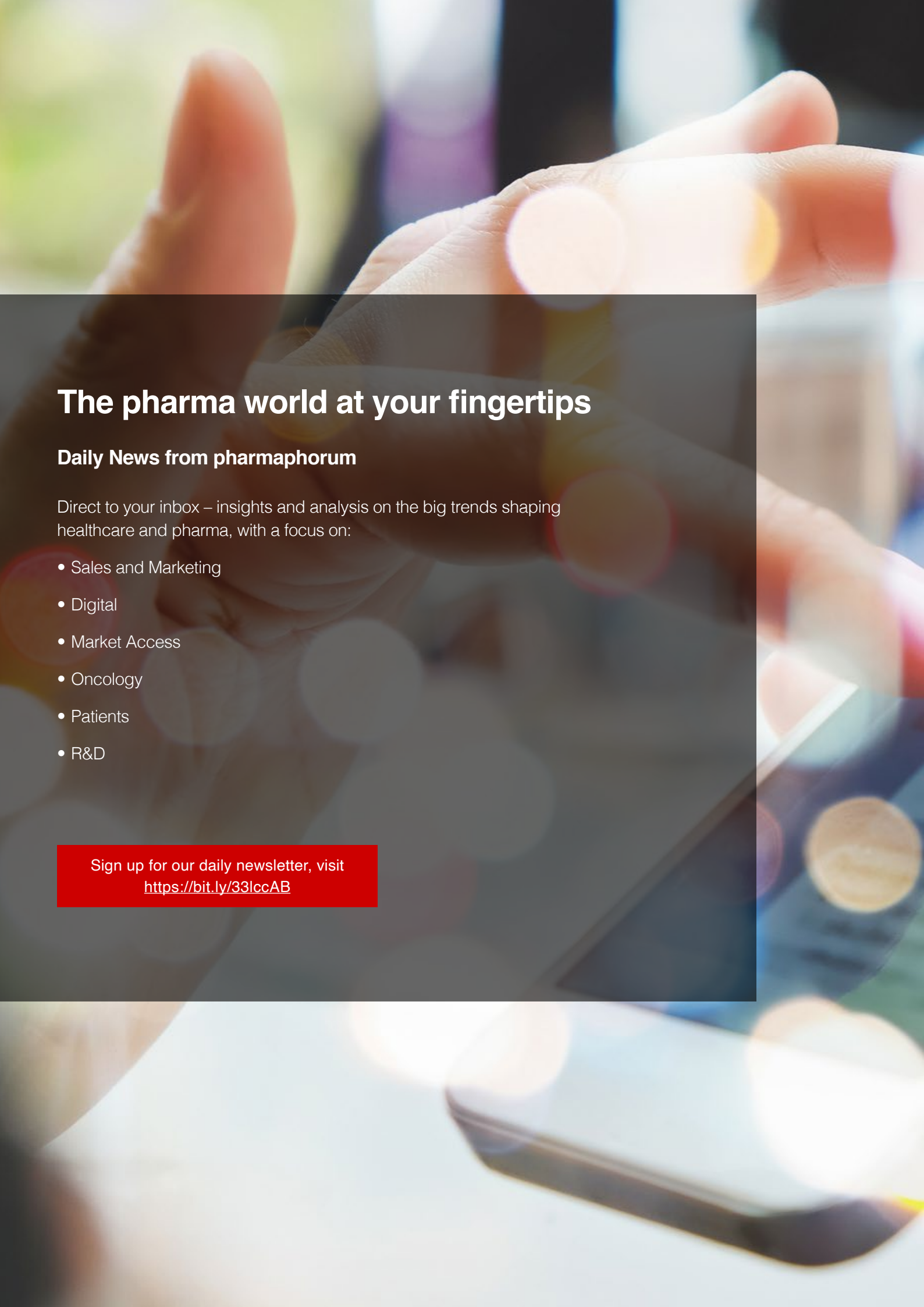
Merck's global head of digital health, Emre Ozcan, conceded that biopharma now understands the value of digital health, while LifeScan's head of global portfolio and project management David DeJonghe – an early entrant to the digital health space – said that it has to be structured around the customer. Global head of the Novartis Biome, Jacob LaPorte mentioned that 'co-create' is not just a buzzword when it comes to pharma and start-ups, while Wellthy Therapeutics' chief business officer Theo Ahadome pointed out the difference between activation of patients and engagement with patients.

During this panel, Alyst was announced by Healthware and R2G. An 'analyst in your pocket', Alyst is a digital health research tool for tomorrow: a future horizon which is bright and necessarily digitalised.

About the author

Nicole Raleigh, Web Editor

Nicole Raleigh is pharmaphorum's web editor. Transitioning to the healthcare sector in the last few years, she is an experienced media and communications professional who has worked in print and digital for over 15 years.



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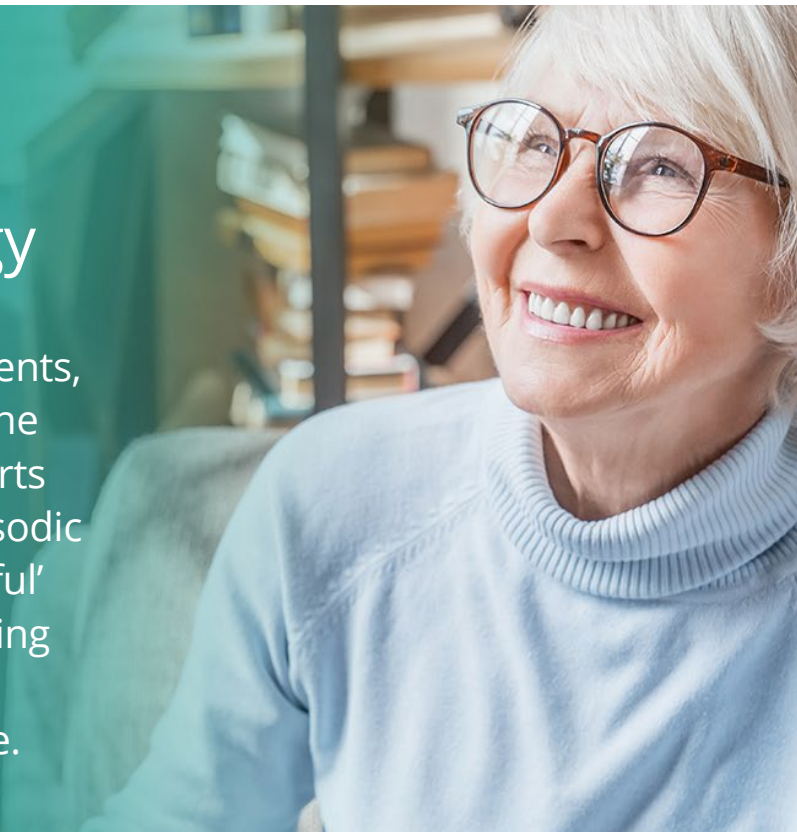
vinehealth

Unlocking the promise of patient support programmes in oncology



Despite significant scientific achievements, cancer remains a tough opponent in the healthcare industry. Traditionally, efforts to combat the disease focused on episodic medical interventions, where 'successful' outcomes were determined by assessing the efficacy and safety of a drug or treatment against the standard of care.

While this approach has unlocked a myriad of therapeutic options for patients, a growing body of evidence shows that exogenous factors, such as genomics, behaviour, and social and environmental influences also play a key role in improving the effectiveness of cancer treatments.

Fuelled by technological advancements, patient support programmes (PSPs) – also known as patient assistant programmes – are gaining attention as a potential way to deliver continual care for oncology patients.

In contrast to the episodic approach to treatment, PSPs recognise that, for the millions of patients living with cancer across the UK, their conditions, symptoms, and treatments do not cease between appointments. In fact, there is a wealth of knowledge to be found in the day-to-day experiences of cancer patients. Yet, until relatively recently, capturing and collecting this data was challenging for HCPs and drugmakers.

As Rayna Patel, CEO and co-founder of Vinehealth, explains, "There is a complete dearth of data around how patients are experiencing their care, and that has a massive knock-on impact on patient quality of life, clinician day-to-day work burden, and the understanding by pharma companies and drug developers as to how they can deliver drugs with the greatest impact and maximise revenues that are associated with that, given the huge amounts that we spend on drug development."

Improving quality-of-life for cancer patients

Although cancer treatment is most commonly depicted within the clinical environment, in reality, most patients living with cancer will spend the majority of their time outside of a hospital. Having only brief and intermittent interactions with their doctors to discuss what they need to do to self-manage their health at home, these individuals and their loved ones face the prospect of navigating the complex landscape of cancer treatment on their own.

For Patel, this disconnect between the clinical setting and self-management at home became apparent through her work as a doctor and neuroscientist. Leveraging her interest in behaviours and psychology, she began to explore how behavioural science could be applied in supporting patients and clinicians in the real-world environment.

"There's a real gap there, between all the things the patients are having to do in their own home and in the community, that really impacts their outcomes that are happening outside of that traditional care model," she explains. "A lot of deterioration or development of toxicity happens away from the care team. Often, there is a real advantage both from a survival and outcome perspective, but also from a quality-of-life perspective, to be dealing with those deteriorations and to be responding in a really rapid, but also individualised way, to what a patient is going through."

Having identified an area of unmet need in cancer care, Patel set about finding a solution to bridge the gap between clinic and home, joining forces with Vinehealth co-founder and CTO, Georgina Kirby, to explore the potential of using PSPs to help support cancer patients and care teams.

With PSPs, patients can actively play a role in monitoring and reporting changes in their condition. Using AI and behavioural science, these tools can help HCPs deliver more personalised support. For example, providing prompts to take medications, and allowing patients the opportunity to log symptoms and medication side effects as they experience them. As Patel highlights, this can have a substantial impact on a patient's behaviour.

Beyond expanding our understanding of cancer care, evidence shows that when cancer patients track and share their lived disease experience with their clinician, median overall survival can increase by five to seven months.

"We often term this patient activation," she says. "It does really change how a patient feels about their disease, how well they manage it, and their outcomes. There is a real benefit and real evidence to improving that level of patient activation."

Maximising patient information for HCPs

When exploring the value of PSPs in cancer care, it is important to keep in mind that doctors can only act on the information provided to them. However, what may be an important symptom or detail to an oncologist may get lost in the ether between appointments if the patient doesn't understand what to look out for or prioritises other concerns during their allocated appointment time.

"It's one of the biggest difficulties as a clinician, that you don't necessarily have all the information that you need to understand who needs your help and when," says Patel. "Often your appointments are short, they might be 20 minutes, 30 minutes, and in that time, you have to gather a full history of what a patient has experienced. Then create a management plan, and most importantly, communicate that management plan and make sure the patient understands it, will follow it, has bought into it, and wants to follow it."

For resource and time-limited HCPs, this traditional pen-and-paper approach to collecting patient information is inefficient, particularly when compared to the capabilities offered through data-driven digital PSPs, which collate patient information into a comprehensive overview of that individual's experience and symptoms. This personalised patient data removes potential communication barriers that can hamper cancer care, as doctors can make more informed decisions about care and identify potential concerns early on.

"Rather than having a default appointment schedule of being seen every six weeks and having to come in and say, 'Actually, I'm fine', and being sent home again, and other times coming in and saying, 'I was really unwell three weeks ago and I ended up in A&E', which is often not the right place for people with complex chronic conditions, [PSPs allow patients to say], 'I'm unwell this minute and this is when I need an appointment'," explains Patel.

Unlocking pharma insights with technology

Beyond advancing everyday cancer care, PSPs can also offer significant benefits for the broader healthcare landscape, notably pharmaceutical companies. Pharma companies spend millions researching and developing new cancer therapies, the success of which will likely be impacted by the same insights that can be collected through these patient platforms.

In previous years, technological and resource limitations meant that accessing this information was a challenging task for pharma companies. Similar to the situation experienced by HCPs, information gaps between home care and clinical care obscured key behavioural and treatment insights from drugmakers. However, thanks to recent drives towards greater digital adoption and patient centricity in healthcare, pharma companies can now partner with PSPs to remove the blinders of traditional cancer care outcome measurement.

Speaking on the benefits that PSPs offer pharma companies, Patel says: “Patient support programmes can be really bespoke around their drug. For example, through a self-serve configuration and through drug-specific information and patient-specific support. Using those programmes to accompany newly launched drugs could really change patient engagement and medication uptake and adherence, closing the gap between what we see in clinical trials and in the real world.”

Adherence is a particular area where pharma companies can leverage PSP data. It's a costly concern, with €125 billion lost each year across Europe due to non-adherence to medication. For Patel, this is where partnering with a PSP can help drugmakers to better understand why patients choose not to take their medications and address areas of unmet need in future developments.

She spotlights a study that Vinehealth conducted with The Royal Marsden, which showed that patients dramatically improve their medication adherence and that they experience a better quality of life whilst using the tool.

"We had a 52% increase in medication adherence, which was really stunning, and 87% of patients reporting that they had a better quality of life whilst using the tool," she says. "Really importantly, we had something like 98% of patients engaging really well with using it across the age spectrum, across the geographic and demographic spectrum."

Delivering on the vision of personalisation in oncology

For Patel, seeing PSPs' impact on HCPs and patients is a rewarding sign that the combination of behavioural science and technology can have tangible benefits in oncology; not only in improving survival rates, but in the quality of life for those living with the disease.

"We had a 90-year-old lady in one of our studies who had never used a smartphone before, never used an app before, but she borrowed her daughter's for the purpose of a small study," Patel notes. "She said that it was an absolute revelation to be able to remember her medications with ease, be able to communicate with her clinician without getting stressed by those appointments, and being able to loop in her daughter and her loved ones into her care and feel like she was being taken care of."

Taking care of individual patients is a critical piece of the PSP puzzle in oncology, particularly as the industry pursues personalised treatment. Using PSP data, HCPs can identify where patients may need more support, which can, in turn, lead to more appropriate allocation of resources, such as developing long-term plans for patient follow-up interactions.

Cancer can be scary and confusing for both those living with the condition and their loved ones. PSPs empower patients to take an active role in their treatment, which, as Patel highlights, can be the spark that drives behavioural change.

Looking to the future, Patel notes that the opportunity to collaborate with pharma companies and patients is only growing as more evidence around the benefits of PSPs emerges.

"The fact that we can deliver such massive benefits across these three stakeholders [patients, HCPs and pharma companies] who all have aligned intentions in many ways, is really important," she says. "I think if you can capture that data and that information in a robust, continuous way, it will enable patient-centric, individualised care and transform healthcare in the future."

About the interviewee

Dr Rayna Patel is a medical doctor & neuroscientist with an MPhil in Translational Medicine. She has extensive experience in academia (Cambridge, Harvard, MIT, Columbia) and was a Post-Doctoral Fellow of Clare Hall College, Cambridge. Rayna has subsequently held strategic & commercial roles in government policy, tech start-ups & the Cabinet Office's Nudge Unit, where she used behavioural science to rewire patient behaviours through digital products.

She is currently CEO and co-founder of Vinehealth, a digital platform using a combination of behavioural science and AI to improve the quality of life and survival of cancer patients, whilst generating crucial real-world data to better inform healthcare delivery and drug development.

About Vinehealth

vinehealth

Vinehealth's platform uses behavioural science and AI to increase the quality of life and survival of cancer patients. The Vinehealth mobile app allows patients to track, understand, and optimise their care, supporting them to feel in control and better self-manage. Patients can track data on symptoms, side effects, medications, and appointments.

This information is seamlessly integrated with lifestyle data from smartphones and wearable devices, and machine learning delivers highly personalised behavioural nudges to support self-management. Through this, the platform generates highly valuable patient-reported outcome data and real-world data to inform healthcare delivery and drug development.

Research Partnership
Inizio Advisory

The rise of the healthcare influencer

Influencer culture has well and truly taken over the internet. From food and fashion to gaming and technology, thousands of online influencers all over the world have built up large and active audiences in almost all industries.

In our line of work, there is another type to watch out for – the healthcare influencer. Physicians, patients, and caregivers are all tapping into the power of social media to communicate with one another and increase awareness about certain issues that are important to them. Among their followers, they are seen as trusted authorities and are helping to generate broader conversations about diseases, conditions, and general health and well-being.

There are numerous benefits for pharmaceutical companies in the healthcare influencer space. Working with these individuals not only yields pertinent insights about what they want and need. By listening to their conversations, pharmaceutical companies can leverage the patient perspective in the design, development, and promotion of their products and services, and build authentic one-to-one relationships. There's just one challenge – healthcare influencers have different profiles compared to traditional Key Opinion Leaders (KOLs).

Physician influencers

HCPs use a wide variety of digital channels to connect with the medical community. According to WHPRMS, almost 60% of doctors use social media for professional use to explore medical information. As a result, it is possible to identify a cohort of qualified and practising physicians who have the ability to communicate to and influence an extensive online HCP and patient community with many thousands and even millions of followers across different platforms. Research Partnership refers to these HCP social media influencers as Key Online Influencers (KOIs).

The healthcare industry needs to recognise this powerful breed of influencers. If they are able to identify the correct KOIs, they have an opportunity to develop and nurture mutually beneficial relationships, which benefit the KOIs, pharma brands, and commercial goals.

Pharma companies usually have a clear idea about how KOLs can support product and brand developments, and have established methods of developing necessary KOL engagements. But as you can see from our example above, online influencers exhibit quite different profiles. Here's how they compare:

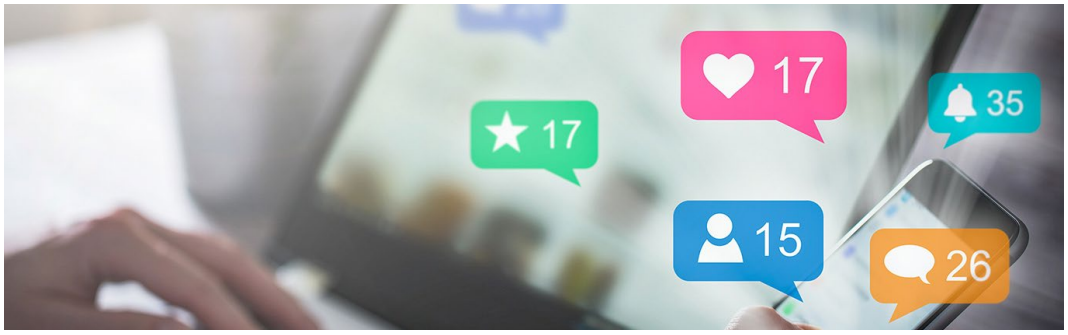
Differences between KOLs and KOIs:

	Key opinion leaders (KOLs)	Key online influencers (KOIs)
Platform	• Medical journals • Conferences • Advisory boards	• Multiple digital channels
Core network	• Colleagues / HCPs	• Broad online following
Volume of reach	• Generally more targeted	• High - large following
Topics of interest	• Scientific discussion	• Varying range of topics
Sphere of influence	• Experience Medical journals	• Online • Public healthcare content
How to identify	• HCP perceptions • Desk research	• Social media analysis

Patient influencers

As mentioned, healthcare social media influencers are also patients, caregivers, and non-healthcare professional individuals who have attracted a significant audience on social media. Research Partnership refers to them as Patient Online Influencers (POIs).

A recent WEGO Health survey in the US (which does allow direct-to-consumer advertising) showed that 14% of patients trust a lifestyle influencer. However, 51% trust healthcare patient influencers. Furthermore, 85% of patients trust a pharmaceutical brand or advert if promoted by a POI.



For their followers, patient influencers promote positive disease management information, encouraging and normalising positive healthcare behaviour. Patients can feel empowered by learning and engaging with these authoritative but empathetic patient leaders. The online health community allows patients to be up-skilled by influencers or expert patients, deepen knowledge about treatment options, and gain new perspectives. These spaces also play an important role in the emotional journey of patients and their mental well-being, gaining reassurance from hearing that what they are experiencing is normal and what to expect along their disease journey in the future.

There are varying types of patient influencers that can be categorised based on the size of their social media audience:

Micro healthcare influencers:	These influencers have a small number of followers but cultivate targeted communities, generating higher engagement rates and building stronger relationships with stakeholders. They can be a patient advocate or have informal partnerships around disease awareness.
Celebrity patient influencers:	A healthcare influencer can have millions of followers, and their influence can snowball by appearances in mainstream broadcast media and newspapers. Dame Deborah James (who sadly passed away from bowel cancer in June 2022) shared her journey since her diagnosis in 2016. She was praised for her openness, fight and drive to not only battle the disease, but also to share vital information such as warning signs people need to look out for with regards to bowel cancer.

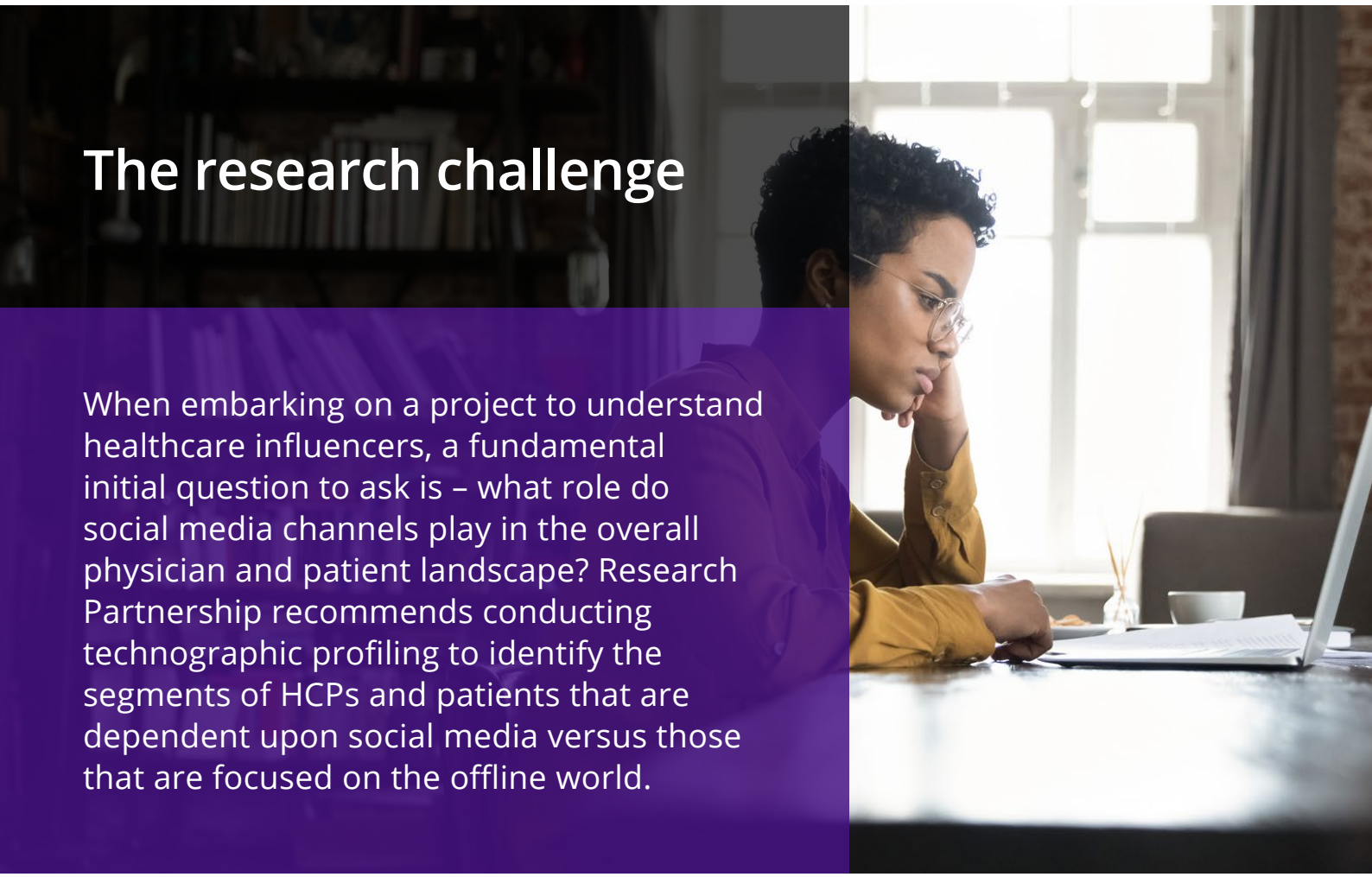
Developing engagement strategies

There are numerous opportunities and benefits for healthcare companies in the online influencer space, including the ability to tap into the conversations that are generating the greatest impact. These insights can help pharma and healthcare companies adapt their messaging and information sources to cater to unmet needs. Furthermore, there can be opportunities to engage and build relationships with influencers, not only to tap into their knowledge, but utilise their sphere of influence.

For example, patient influencers can be included on advisory boards to support the development of treatment solutions and patient support programmes by providing a highly patient-centric perspective. Physician influencers can be invited to lead a clinical trial, which can generate awareness of data among their online following. If the KOI often writes articles or blogs, then the pharma company can provide them with exclusive information or support the development of original content, which can be shared with their audience.

The key is developing a strategy for engagement. What that strategy looks like depends on specific marketing objectives set, and whether the pharma company can develop the correct relationship. This process can't be rushed. The relationship must be mutually beneficial to both parties and slowly nurtured. There are a number of ways to do this. For example, pharma could begin by inviting them to be a speaker at a conference (including virtual events). The KOI could then share data and key messages before, during, and after the event (as well as generate social media buzz and discussion).

The research challenge



When embarking on a project to understand healthcare influencers, a fundamental initial question to ask is – what role do social media channels play in the overall physician and patient landscape? Research Partnership recommends conducting technographic profiling to identify the segments of HCPs and patients that are dependent upon social media versus those that are focused on the offline world.

This step is critical, as it will determine the size of the patient and prescriber population that is influenced by social media channels (and hence justify the need for social media analysis).

Social media analysis uses big data analytics to identify the healthcare influencers with the largest number of followers who are generating a significant impact with the information they post and are influencing an interconnected network of peers (e.g. physicians, patients, and caregivers).

We can also utilise social media analysis to more deeply evaluate the types of conversations they are having, the nature of the information they are creating and sharing, and which topics are generating the greatest intention.

However, there are certain restrictions of big data analytics that should be mitigated. First of all, the limited shelf-life. Social media is highly dynamic, and influencers can be highly ephemeral – rising out of nowhere and then disappearing completely. In addition, the topics of interest can also change and evolve quickly. To overcome this, we suggest that every one to three months, pharma conducts validation projects to assess the relevance of identified influencers and to monitor the rising stars.

Lastly, we also recommend getting an understanding of the sphere of influence outside social media: what activities, if any, are these social media influencers doing offline? Do physicians who are not heavy users of social media recognise these influencers? To what extent are they KOLs? These answers will be key to understanding the most effective influencer omnichannel strategy (digital and traditional channels). These objectives can be met via traditional online questionnaires triangulated with social media analytics.

At Research Partnership, we have started to notice significant interest in influencer mapping research across a range of therapy areas and have developed an effective approach to provide pharma companies with essential recommendations on how best to involve influencers in their development plans. Influencer ID identifies, profiles, and maps the key online influencers in chosen therapy areas to reveal important metrics.

About the authors

Paul Reed, director for Research Partnership

Paul Reed is a director at Research Partnership, focused on healthcare market research for the past 18 years. In response to the trend of online healthcare influencers, he has been helping pharmaceutical companies identify and understand offline and online influencers and supporting them in the development of engagement strategies. Reed has considerable experience with traditional KOL mapping, as well as integrating the more innovative big data social media analytics.

Basil Feilding, associate director for Research Partnership

Basil Feilding has extensive experience identifying and profiling different influencers for healthcare companies. In the early 2000s, he worked in the US developing a product aimed at helping pharmaceutical companies identify and work with KOLs at the regional level. Since the COVID pandemic, he has brought this experience to help pharmaceutical companies in their identification of and engagement with online influencers.

About Research Partnership

Research Partnership, an Inizio Advisory Company, is a world-leading custom and syndicated global insights partner for health and life science companies that optimises commercialisation success through evidence-based, story-told insights and recommendations. We provide custom market insights, syndicated real-world insights, and market access insights for the entire product lifecycle. Derived through rigorous research design and socialised outputs and delivered through an agile, collaborative approach by market research experts and thought leaders, our insights empower better decisions and create long-term value for patients.

vinehealth

Company profile: Vinehealth

The Vinehealth digital personalised cancer support platform maximises quality of life and clinical outcomes for cancer patients by delivering personalised cancer support at scale.

Comprising the Vinehealth patient app and the VinehealthPRO clinician dashboard, the Vinehealth digital cancer support platform generates highly valuable, real-world data for insight development, peer-reviewed publication and scientific meeting presentation, as well as to inform clinical decision-making, earlier detection of deteriorations, personalised patient follow-up, and more efficient healthcare resource delivery.

The Vinehealth app allows patients, via their own smartphones, to easily track, understand, and optimise their care, supporting them to feel in control and better self-manage. Patients can set reminders for medications and appointments, integrate lifestyle data from wearables and devices, and record and track clinically validated data on symptoms, toxicity, patient reported outcome measures (PROMs), and quality of life (QoL).

The VinehealthPRO clinician dashboard delivers rich, longitudinal data – such as PROMs generated from questionnaires, such as EQ5D – and red flag symptom data to inform both healthcare provision and academic research. Clinicians can request and view custom symptom data, adverse events, PROMS, toxicity assessments, and clinical metrics such as temperature. Clinicians can view, pre-empt, and rapidly address clinical deteriorations and deliver more personalised, efficient care.

Patient Support Programmes (PSPs)

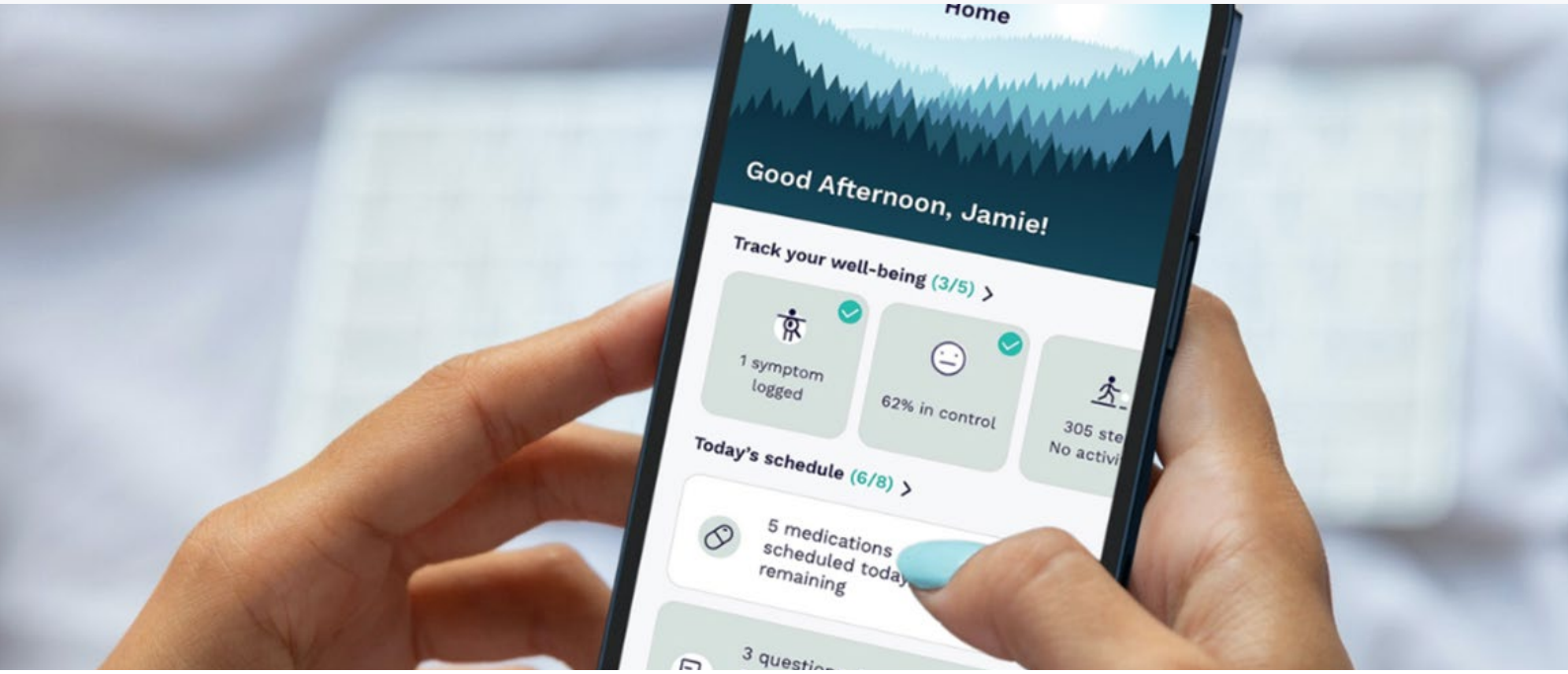
Vinehealth provides life sciences companies a regulatory compliant, off-the-shelf solution for digitised personalised cancer patient support programmes. With seamless patient onboarding through the VinehealthPRO platform used by cancer clinicians, and bespoke app content provided by you for your patient cohort of interest (e.g. patients using your anti-cancer drug), Vinehealth makes it easy to create, scale, and deliver digital personalised cancer patient support programmes that improve patient engagement, medication adherence, and treatment outcomes.

Vinehealth off-the-shelf PSP is:

- **Patient-centric** – Vinehealth app is designed for and valued by thousands of cancer patients
- **Fast to market** – Bespoke content can be rapidly integrated into the Vinehealth app and ready to deploy in days
- **Regulatory approvals for rapid scale are complete** – including CE-marked class 1 medical device, Cyber Essentials certified, GDPR and HIPAA compliant, NHS Data Security and Protection Toolkit certified

Deliver personalised patient support through the Vinehealth platform to:

- Improve patient engagement, medication adherence, cancer treatment outcomes
- Reduce burden on clinicians and healthcare resources
- Generate rich PROMs and QoL data to inform improvement in cancer treatment, cancer services, and cancer treatments



Real-world evidence studies

Today, we have limited insight into cancer patient status between clinical encounters, where 99% of the disease experience occurs. Vinehealth digital personalised cancer patient support and seamless, remote data collection produces exceptional patient engagement over extended periods of time. Life science researchers can gather patient reported PROMs and QoL data reflecting cancer patients' lived experience with cancer to generate publishable insights and real-world evidence.

Vinehealth real-world clinical studies provides:

- An intimate lens on patients' lived experience with cancer
- Deeper understanding of patient cancer treatment, e.g. toxicity, PROMs, QoL
- Aggregated, longitudinal, real-world data

To learn more about Vinehealth and our work in PSPs for life science, view our case studies.

Read article

vinehealth

About Vinehealth

Vinehealth was founded in 2018 by NHS medical doctor Dr Rayna Patel and health technology specialist Georgina Kirby, who both shared a vision of using technology to empower patients to take an active role in their cancer care. The result of their efforts, Vinehealth, offers patients, care teams, and life science partners a fully customisable and regulatory compliant platform to help achieve exceptional patient engagement, track medication adherence, toxicity and quality-of-life data, and to view and rapidly address clinical deteriorations.

Year founded

2018

Founders

Dr Rayna Patel
Georgina Kirby

Headquarters location

London, UK

Support & Recognition

- CE-marked class 1 medical device, FDA approved under enforcement discretion
- Acceptance into NHS England Innovation Accelerator Programme supporting faster uptake and spread of high impact, evidence-based innovations across NHS England
- Highest-rated cancer app, a score of 93% by The Organisation for the Review of Care and Health Apps (ORCHA)
- Support across the health and life-science ecosystem, partnering with leading cancer charities including CRUK and Prostate Cancer Research, several Academic Health Science Networks (AHSNs), and leading NHS cancer centres including Royal Marsden and UCLH.

Studies

The Royal Marsden NHS Foundation Trust 2020 evaluation of the Vinehealth

- **100% PROMS** completion
- **97% patient engagement**
- **87% of patients** reporting improved quality of life through using the platform
- **52% increase in medication adherence**

Why and how AstraZeneca launched a truly people-focused healthcare innovation hub

In the world of healthcare innovation, it's easy to lose sight of healthcare's end user – the patient – and to find yourself designing solutions that don't truly align with their problems. AstraZeneca (AZ) is tackling this problem with Health Works, a radically problem-focused innovation lab. We spoke with two leaders at Health Works and a former Health Works partner who now works at AZ to learn how the operation ticks.

The healthcare systems of the world are broad and complex. There are many steps between the creator of a drug, device, treatment, or therapy and the patient who ultimately benefits from it.

Stakeholders from pharma to hospitals have begun to incorporate patient centricity and patient engagement into their cultures in an effort to keep the patient's needs and interests at the forefront of development processes. Too often, however, this becomes a formality or a box to check midway through a process or even towards the end of it, rather than the force that drives a process from the start.

"A lot of digital tools are developed by super bright people that know how to program and are good marketeers, but they've often never even met somebody who lives with heart failure," said Martin Cowie, clinical vice president, cardiovascular, renal, and metabolic research and development at AstraZeneca. "They have an idea of what 'good' would look like to develop it to a high standard, but when you test it with the target users, it all falls apart because somebody who is 75 doesn't generally have the digital skills of a 25-year-old."

It's not hard to understand where that disconnect comes from: successful innovators often draw lessons from other industries, where there isn't anything comparable to the patient. Stefan Vlachos, the head of Health Works, described his realisation coming into healthcare from other fields.

"In other industries I've worked in, we've measured innovation based on growth and profitability," he said. "In healthcare, that's not a metric for success. We want to measure whether people are living the lives they want, and very rarely do they want to spend months in a hospital."

Health Works, an innovation hub within AZ, started a little less than two years ago to find new ways to improve healthcare experiences, support health system sustainability, and drive equitable access to quality care. The team partners with patient groups, providers, and other stakeholders to really invest in understanding their problems first – before starting to look for solutions.

"Quite often, we don't get to understanding the problem until it's a little bit too late," Mia Ekdahl, head of communications and relations at Health Works, said. "We're so immersed in the opportunity of solutions, so we jump to solutions before we fully understand exactly who has a problem or what needs to be done to address it."

Cowie now works for AstraZeneca, but first worked with Health Works as the head of the heart failure unit at Brompton hospital.

"Health Works brings together all parties – not just developers of digital technologies – to understand the problem they're trying to address," Cowie said. "They ask people living with conditions about their experience directly, rather than learning about it from a nurse, doctor, or textbook. In my experience, it's been helpful to engage with patients from the beginning rather than later, when it's difficult to change tack."

How Health Works, works

The core idea that makes Health Works special is that it's an innovation hub that starts with problems and people, not solutions. That means that from the get-go, the team has to be strategic about selecting its partners and working with patient groups or healthcare providers – people close to the problem.

"We want to find collaborators who want to work with us to solve the situations, opportunities, challenges that they're aware of," Ekdahl said. "We're looking for patient groups. We're looking for healthcare organisations – either single hospital groups or NGOs linked to healthcare. Companies can also be part of a project application, but we really want the users – the healthcare organisations, the patients – represented."

They ask partners to come in and work with them, putting in equal time. And no money is exchanged in the process.

"We are looking for, number one, projects that involve at least one external party, maybe several, where we work in a real partnership," Vlachos said. "That means that all parties put equal skin in the game. So, we are not paying someone else to do work for us. That might make it harder to find those partners, but it makes it much more likely that it will move on after that."

And while the inspiration may have come from digital tools, the problem-driven work covers a much broader canvas.

"Some of the public literature people reference is from 20 years ago, but we don't know if the problems of people living with liver disease, kidney disease, or heart disease today are different than they were back then," Cowie said. "What's important to patients in 2022? What would they see as an improvement? For example, in heart failure, doctors focus on breathlessness, but patients struggle most with fatigue and lack of social interaction. Health Works' goal is to take it back to basics and understand the core problems we're trying to solve."

Truly understanding problems is more complicated than it sounds. It means understanding them from multiple perspectives and ultimately recommending a solution that works for patients, fits into providers' workflows, and is sustainable in terms of business models.

"Service-centred design is at its core about finding the empathy," Vlachos said. "In order for a solution to stick and last over time, there has to be a viable business model, and not only in terms of costs and revenues on the positive side. We have the ability beyond the project to reach the people that we need to reach, to build the partnerships that we need to be in place for things to work for end users in a way that's viable long term."

Following a design-thinking process – coined the "double diamond" method – Health Works starts out interviewing stakeholders to find out what the real problems are: what patients see as their problems and what problems doctors run into trying to address those problems.

"Then we boil it down to understanding what is it that really needs to change to make a difference," Ekdahl said. "Once we understand that, we're going into the creation phase, what do solutions look like to fit this defined problem?"

And those solutions, like the problems, can involve digital health – or not.

"The scope of what types of output could come from a Health Works project could be very many different things, and that's what we're working on a lot right now," Vlachos said. "The output could be a new product of some kind, It could be a suggestion that we need to change policies or the ways patients interact with different caregivers. It could also be a suggestion of how reimbursement models can change for this solution to live on sustainably."

Health Works doesn't go as far as to actually create or even solicit those solutions. Instead, it builds a detailed blueprint that its partners can take into the solution phase. The solution may well turn out to be something that's already in the market, or something out there might work with some tweaks.

"I strongly believe that for a lot of the challenges we have, there are already solutions," Ekdahl said. "It's about matching the right problem to the right people for the right solution. And that is partly what Health Works is trying to do. We're just taking a more people-centric view rather than a techy or scientific, biology view to the process."

What's in it for AstraZeneca?

Health Works is an unusual operation, but what strikes people as even more unusual is that it's happening under the aegis of big pharma – large companies that are highly concerned with margins and ROI.

"The most common question we get is what's in it for AstraZeneca if you're not earning money, if this is not affecting the bottom line," Ekdahl says. "But I would say it does impact the bottom line, in the long run, because we're learning new things, we're building new networks, we're seeing things we might not have thought about, which, of course, will benefit our research and development in other areas."

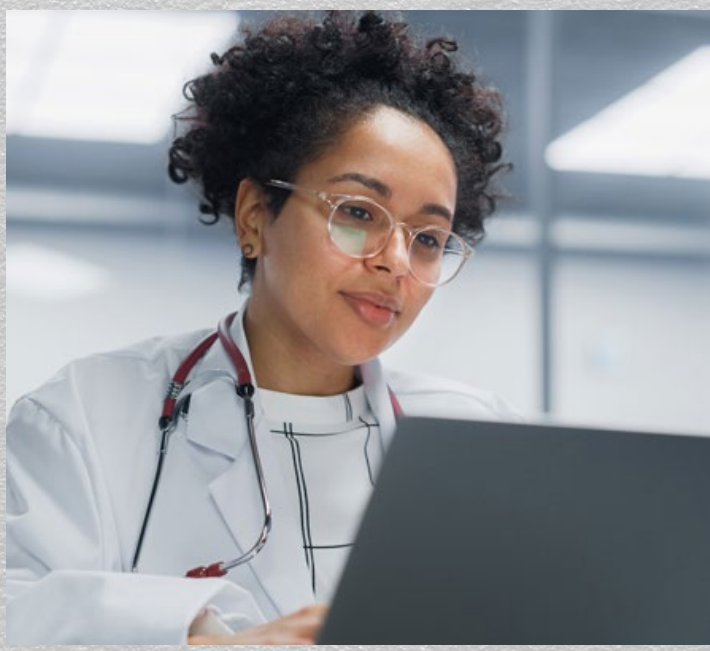
"If we understand how medical problems affect people better, we'll be better drug developers," Cowie added. "So, it's not a dollar kind of return within a short time period. It's more a long-term resetting, recalibrating, 'rising tide lifts all boats' type approach, which I think is admirable."

And of course, there is an element of philanthropy in the investment as well.

"Health Works is one of the things AZ does to support a long-term investment in healthcare sustainability," Cowie said. "It's part of being an ethical drug developer; you may profit from some things, while others support the general good."

Health Works does make some effort to tailor its projects to line up with AZ's core therapeutic areas, Vlachos says. But they never steer their work toward AZ solutions.

On the one hand, the group leverages its position inside the organisation – Ekdahl says that part of the value proposition for partners is access to AZ's 80,000 experts around the world. On the other hand, their position outside of the core pharma business, and their close work with non-pharma companies, are seen as a strength.



"Pharma companies, as many specialists do, tend to view people from a very specific perspective," says Vlachos. "When I worked at Karolinska [Health], the neurosurgeons tended to see people as a brain with some neurons dangling into the spine. We tend to see people as some molecules that we add other molecules to drive health outcomes. People who are sick or at risk of being sick don't think of themselves like that. So that's part of what we need to understand."

Ultimately this perspective shift is, in itself, a value Health Works offers to its parent company.

“We can never rid ourselves of our preconceptions, but we can train ourselves to put them in one bag and then look at what can we learn,” Vlachos said. “And then we can say, ‘These are my preconceptions. This is where they match [reality]. What do I need to learn? What do I need to re-learn?’ This is how we have the greatest impact.”

About the interviewees

Martin Cowie is clinical vice president, cardiovascular, renal, and metabolic research and development, at AstraZeneca.

Stefan Vlachos is head of Health Works at AstraZeneca

Mia Ekdahl is head of relations and communications at Health Works, AstraZeneca

About the author

Jonah Comstock, Editor-in-Chief

Jonah Comstock is a veteran health tech and digital health reporter. In addition to covering the industry for nearly a decade through articles and podcasts, he is also an oft-seen face at digital health events and on digital health Twitter.

Video:
Live from Frontiers Health 2022

At Frontiers Health 2022, pharmaphorum editor-in-chief, Jonah Comstock, sat down with industry experts from across the life sciences to learn more about the digital therapies, breakthrough technologies, healthcare transformation, investments, and ecosystem developments driving innovation in modern healthcare.

Below, we bring you the best insights, anecdotes, and industry forecasts recorded live from the event floor in Milan. Hear from health innovators, including Sai Shankar and Pierre Leurent, co-presidents of Aptar Digital Health, chief policy officer for Digital Therapeutics Alliance, Megan Coder, and self-proclaimed 'digital health curmudgeon', Matthew Holt, the founder and publisher of the Health Care Blog.

Click the thumbnails below to watch the full interviews

PODCAST

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bringing healthcare together

Create, approve, deploy: supercharging communications with modular content

Each year, pharma and life sciences invest large amounts of time and money in creating content designed to attract HCPs and call them to action. However, it's no secret that the landscape of healthcare communications has undergone a substantial transformation in recent years.

The accelerated adoption of digital channels – combined with the ongoing disruption caused by COVID-19 – has changed the way that customers seek out and engage with content.

"We have changed as consumers," explains Viseven CEO Nataliya Andreychuk. "Our attention span has changed, and so we are consuming information differently. Instead of spending a lot of time reading articles and sticking to one source of information, we now spend less than one minute looking for an article and searching through several channels, all from the one device."

Modern marketing requires a much more agile approach than the industry is used to. We have come to expect seamless, dynamic, and personalised engagement experiences across a variety of channels, and healthcare providers are no exception. Targeting audiences across numerous channels requires marketing teams to create large volumes of content, as well as a unique personal content experience for every target audience. As such, demand for greater volumes of personalised digital content has skyrocketed.

For an industry such as pharma, which must adhere to strict legal and regulatory procedures, creating an agile communications strategy can be a complex challenge. This, Andreychuk says, is where modular content can provide a highly effective solution to help teams address some of the biggest content marketing barriers: resource limitations, speed to market, and consistency.

Building a 'library' of approved content blocks

Modular content has often been likened to using reusable building blocks. Each 'block' or module is a pre-approved piece of content – such as product claims, logos, copy, videos, or graphics – that can be quickly assembled or repurposed into a ready-to-deploy asset.

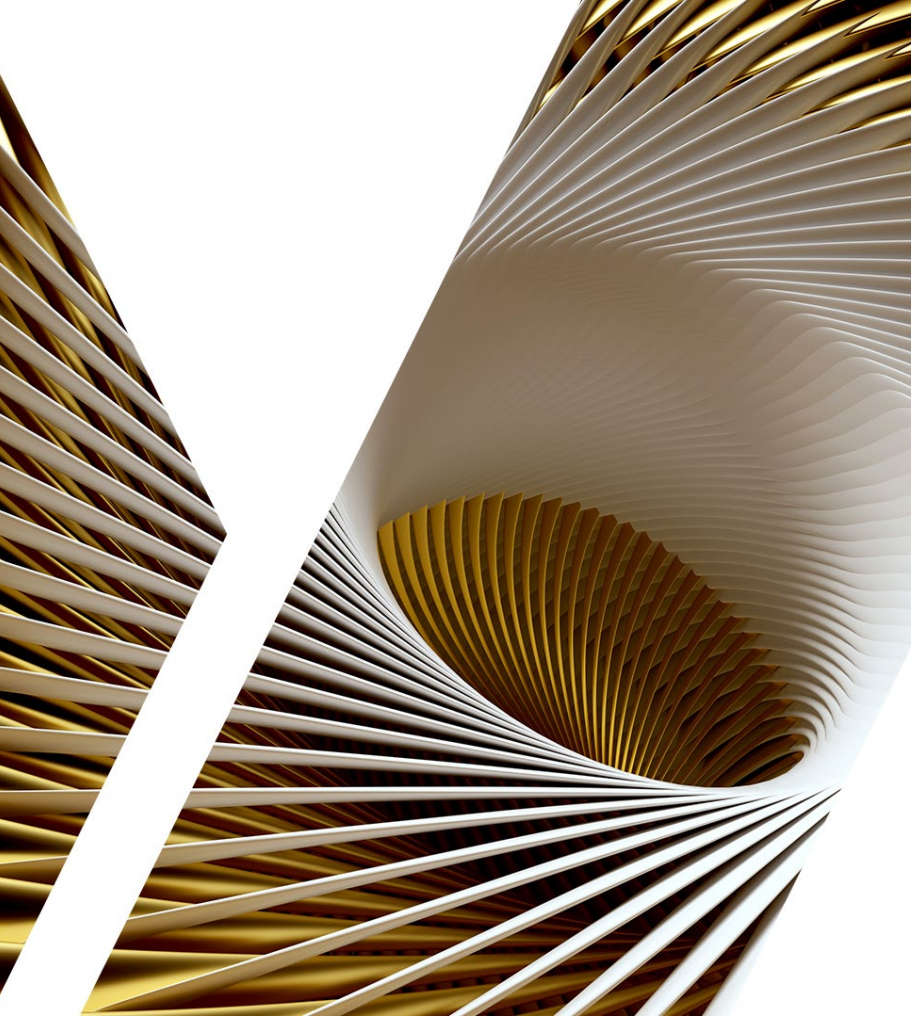
"Modular content breaks a big document into meaningful chunks that are well structured, semantically categorised, and ridged," says Andreychuk. "They are really designed to be discoverable, reusable, not just across the different channels, but across different information products, different families of information products, and across different audiences as well."

In contrast to traditional methods of communications, which require lengthy turnaround and approval times for each specific use, with a modular approach, each 'block' can be predefined and organised according to the main content requirements and used in various forms, from SMM content and emails to interactive presentations like an eDetailer.

"With modular content, we un-prison content; we unlock the format. We do not stick to some format, which is feedable to only one channel or informational product. Modular content breaks this paradigm, and by breaking it, helps to serve the innovation, which is omnichannel communication," explains Andreychuk. "What is most important is that it is trustworthy content. It is validated. It is approved."

For pharma and life sciences companies, modular content can help to address a significant barrier to agility – bottlenecks caused by lengthy medical, legal, and regulatory review processes. Given the nature of the industry, each piece of content must adhere to the rigorous compliance requirements demanded of certified healthcare communications. While this process does reduce the risk of distributing incorrect or harmful information to customers, it has the knock-on effect of impeding agile and dynamic communications, as every new piece of content must be individually analysed and approved.

With modular content, pharma companies approve each 'block' individually, meaning that any claim updates or changes can be made to the module directly rather than requiring teams to recreate or reapprove the whole completed asset. As such, teams can piece together and publish assets faster and safely in the knowledge that the content is appropriate and meets the mandatory requirements for external release.



Creating a ‘Single Source of Truth’ for dynamic content

With numerous components, stakeholders, and teams involved in creating, reviewing, and distributing content, it is important that companies invest in an effective way to govern all assets.

As Andreychuk explains, digital asset management (DAM) systems act as the backbone of modular content and, in turn, omnichannel communications.

Large corporations, such as pharma companies, produce large volumes of data and information, which have been traditionally housed in siloed content libraries. As such, visibility is limited, and teams across departments often end up creating duplicate content for different channels and uses.

A global DAM system unites all teams under a 'Single Source of Truth'. In this central hub, teams can easily store and access all of the company's pre-approved modules.

"Modular content only has to be created once, approved once, and retired once," says Andreychuk. "The metadata assigned to one module will not only help to reuse it and repurpose it through different channels and information products, it also will help us to track it, to trace the approval status, if it is approved, and when it was approved.

"[We can also track] the expiration date, so when any of the resources used in this model will expire, for example, if a module includes a call to action, such as opt-ins connected to consent, we can see if this consent status was taken."

Through metadata, teams have access to a comprehensive auditory trail for each asset. However, as Andreychuk highlights, it can take time to build the necessary ecosystem to govern this system.

"Every piece of content has to be tagged, and there needs to be a taxonomy system in place," she says. "All of these data connections must be well orchestrated and work together to ensure that once we reuse this piece of content, then we can really see all these statuses, highlights, and we will be directed into the right area if marketing review is needed."

Laying the foundations for tomorrow's communications

Although pharma and life science companies have, understandably, lagged behind other industries when it comes to digital adoption, it is evident that omnichannel marketing and modular content are here to stay. To survive – and thrive – in this evolving environment, organisations need to evolve alongside their customers.

For Andreychuk, to maximise the success of modular content strategies, it is important that companies establish clear goals and expectations, which are then communicated to the wider organisation. With defined objectives in place, teams can afford to move faster, creating supporting materials that seamlessly slot together underneath the broader concept strategy.

To remain competitive and relevant for the next generation of digitally native customers, the pressure is on pharmaceutical companies to adapt – or risk falling behind. This is not one step, she notes, but a series of smaller achievements that should be celebrated along the way to achieving true omnichannel, personalised engagement.

“It’s really not a trend or some modern occupation; it is really the necessity,” she concludes. “Making your content modular, intelligent, connected, and personalised, I would say, is the backbone of marketing and content strategy for today and tomorrow.”

About the interviewee

As a digital marketing professional with over ten years of expertise, Nataliya Andreychuk has contributed to developing advanced digital solutions and software for clients in more than 70 global markets.

Andreychuk is also of Ukrainian background and witnessed the start of the war. However, being a global company leader, she had the hard task of balancing communication with clients and her staff, some of whom needed help relocating to safer areas. She was there at the beginning of digitalisation in life sciences and pharma marketing.

As part of her job as the CEO at Viseven, a global MarTech provider, she is bringing marketing interactions in pharma to the next level by introducing new methods to more companies.

About Viseven

VISEVEN

Viseven is a global services provider for the Life Science industry, operating in MarTech (Marketing Technology), which offers end-to-end tailored-made solutions to build omnichannel excellence from any point and level of digital maturity.

Our team consists of 700+ industry professionals who work toward the same goal – to implement the best-in-class omnichannel projects and communication strategies for the global pharmaceutical market.

Case Study: How Syneos Health and VBI Vaccines delivered a new kind of partnership model

For millions of people around the world living with infectious disease and cancer, the arrival of a new prophylactic or therapeutic vaccine on the market can be life changing. But in order for a treatment to reach patients, it needs to be launched.

Commercialising a vaccine, even one that targets an unmet need, is a challenging task for companies. To bring therapies and medicines to patients with unmet needs, forming new strategic partnerships can be key, giving smaller organisations access to the information, resources, and reach needed to support a vaccine launch. Finding the right partner is not always a smooth process, but as Lee Taurman, executive vice president, global head of full-service commercial, Syneos Health, and Jeff Baxter, president and CEO for VBI Vaccines, discuss, exploring non-traditional partnership models can open up even greater opportunities to advance public health efforts.

To illustrate how such a partnership model can help companies to thrive, Baxter and Taurman share their experience of industry collaboration, and detail how Syneos Health and VBI Vaccines took a somewhat unconventional approach to prepare for the launch of VBI's 3-antigen hepatitis B vaccine in the US, Europe, and Canada.

The challenge: commercialising prophylactic vaccines

Hepatitis B (HBV) is one of the world's most significant infectious disease threats, with an estimated 296 million people chronically infected with HBV globally, according to the World Health Organization (WHO). It is up to 100 times more infectious than HIV, and while there are approved prophylactic vaccines available, there is currently no cure.

Preventing infection is a critical healthcare challenge. Yet, the WHO estimates that only 40% of newborn children receive their first dose. Adult vaccination rates drop off from there, and surveillance varies by country. In the US, the Centers for Disease Control and Prevention (CDC) estimates that just 30% of adults are vaccinated against HBV. As such, there is a huge opportunity to improve vaccination rates and protect people from that initial infection.

"Hep B is known as the silent killer because people don't actually see symptoms manifest physically, usually until they are in their early 40s or 50s," says Baxter. "In fact, the WHO estimates that only 10% of that 296 million people who are chronically infected across the globe are actually aware that they have HBV. So, if people in their teens, 20s, and 30s are living their lives, unaware that they have HBV, there is a higher potential for HBV to be spread."

Having identified the unmet need for preventative vaccines for HBV, VBI Vaccines developed PreHevbrio, a 3-antigen adult hepatitis B vaccine, comprised of the S, pre-S1, and pre-S2 surface antigens of the hepatitis B virus.

But, as VBI Vaccines understood, while PreHevbrio had clear potential to help reduce the risk of infection, the company would need to partner with an external organisation to successfully differentiate the product from competitors on the US market.

The solution: finding the right partner

With PreHevbrio, VBI Vaccines had a product with a strong scientific foundation, but to get the vaccine into the arms of patients, the company needed to find a strategic partner with the resources and expertise required to take commercialisation efforts to the next level. Importantly, the right partner needed to understand what VBI Vaccines aimed to achieve, and work with the company to meet these goals.

As VBI Vaccines began to explore potential partnership options, one company emerged as a clear frontrunner: Syneos Health. The two companies had already been working together on the pre-launch strategy and activity for a little over a year, beginning in 2019. However, unlike more traditional commercialisation partnerships, both Syneos Health and VBI Vaccines were keen to establish a new method of collaboration.

"As you take things to market, I think there has always been this binary choice of either, you licence the product away or build everything yourself in house," says Taurman. "Ultimately what we have been able to do is create an alternative to that – a middle ground if you will – where you retain the asset chain, the strategic decision making, the optionality associated with what you do with that product moving forward, but you build towards a commercialisation programme really allowing you to focus on the strategic area that you chose."

Results/ benefits: building an agile partner relationship

By partnering with Syneos Health, VBI Vaccines gained access to talent, operational effectiveness, and delivery that would have been otherwise highly challenging to achieve. As Baxter and Taurman explain, both parties brought their own specific skills and expertise to the table – VBI had the science behind PreHevbrio, and Syneos Health, a delivery model with a proven record of accelerating launch performance.

For Baxter, it was a true meeting of minds. Having previously worked alongside each other, the teams came to the partnership with a mutual understanding of what they were aiming to achieve. It was, as he describes it, "a single vision and model of a successful launch and commercialisation of PreHevbrio."

"Traditionally, you would just sell a consulting project, do it, and move on, hoping that maybe there's another one after, but really we are unique in that we have agency capabilities, field funding capabilities, and we have a lot of people who are from the industry with service backgrounds," says Taurman. "So, how do we meet VBI where they are, with what they need and have a broader relationship, perhaps, where we can help them in a more meaningful way than just as a simple single service provider?"

By approaching the partnership as a truly collaborative process, Baxter notes that each organisation was able to focus where they would provide the most value. As a smaller biotech, the process of attracting and recruiting the right team members is a lengthy and consuming process, one that detracts from the important focus of internally and organically developing new assets to address unmet needs.

"As a one product bag, or even two product bag biotech, it would be difficult to attract the very best people in our industry," he explains. "Partnering with Syneos Health gave us access to talent, operational effectiveness and efficiency, and delivery. But also – at the time and even now – because of the pressure workload and opportunity in our pipeline, I didn't want the distraction of having to hire 80 people and manage those people."

With the team in place, VBI and Syneos Health leveraged their combined expertise to develop a commercialisation strategy that addressed a critical challenge for prophylactic vaccines, using PreHevbrio's key differentiator. As Taurman and Baxter both acknowledge, launching a preventative vaccine is a unique process as, unlike therapeutic products, a prophylactic either works or it doesn't, which makes it difficult to demonstrate why clinicians should favour a new product.

Leveraging Syneos Health's prior commercialisation experience, the partnership elected to spotlight PreHevbrio's position as the only 3-antigen hepatitis B vaccine.

"With the Syneos Health team, in terms of the value proposition of this product, we were able to recognise very early on that we were going to have to differentiate by focusing on the 3-antigen composition – i.e., the Pre-S1, Pre-S2, and S antigens of HBV. We then recruited a team of Medical Science Liaisons (MSLs) in North America to start talking to Key Opinion Leaders (KOLs) using our clinical data and peer-reviewed publications," explains Baxter.

"It's inherently a scientific debate. But you only get those insights by working with people who understand the scientific proposition – and then Syneos Health's commercialisation expertise told us that we should get MSLs in the field as soon as they are able to start sharing this published data to get KOLs aware that this product is coming," he says.

While progressing through the initial phases of a vaccine launch have provided achievements worth celebrating for both VBI and Syneos Health, Taurman notes the importance of growing together as smaller biotechs may choose an external partner to mitigate risk early on, but as they build and grow, may choose to develop resources internally.

"Our model and the way we work with people recognises that. We understand that the relationship needs to evolve as the company's strategy and position evolves over time," he says. "There is a back and forth in the evolution of that, so it is a pretty attractive model that gives you a good amount of flexibility and dynamic changing over time, as market conditions and strategic priorities change over time."

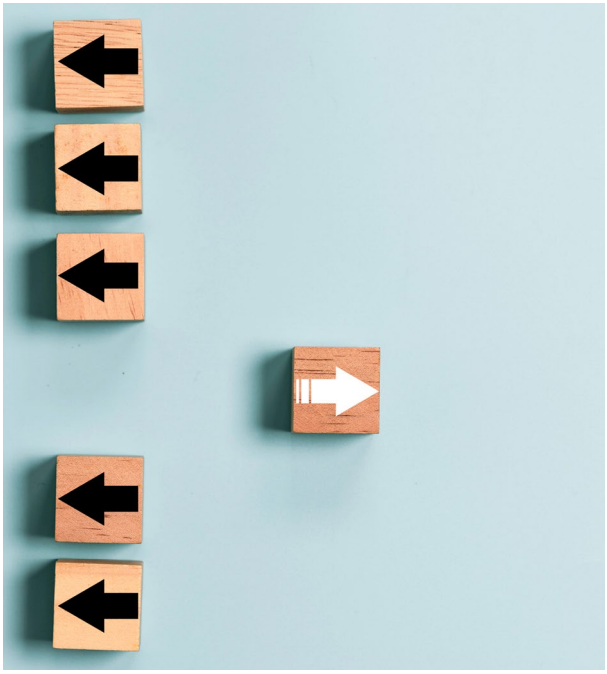
Key takeaways: the spirit of partnership

For both Baxter and Taurman, being at the forefront of a new type of partnership model is an exciting prospect. By arriving at the table with a mutual drive to bring products to market in new and more efficient ways, a collaboration can develop beyond the traditional one-and-done transaction, into a meaningful partnership.

"In some of the relationships that we have with non-partnership clients, it is transactional to an extent. There is a job to be done and there is an order given and an execution to be done. That's a fine relationship. It is the basis of the services industry," says Taurman.

"But in the relationship that we have with VBI, it is a partnership, and we work together to accomplish the goals that were set, there is an ongoing dialogue, neither of us sees this as a transactional relationship – even though there are transactions that occur between the companies. Everything is done in the spirit of partnership," he says.

Baxter echoes his faith and trust in this sentiment. He notes that, while Syneos Health and VBI are yet in the early days of the commercial launch, it is clear to all involved that the partnership is building towards something greater, capable of matching or exceeding the level of tangible results expected of conventional service provider transactions.



Taurman agrees: "There is a mindset shift when you are in that kind of relationship because you can make an investment in a person or in something and that can pay off down the road. We can take chances on things and know that if they don't work out that we'll respond to those challenges together."

"I think there is a real opportunity to look back and say we really were at the forefront of something new. That's pretty exciting."

About the interviewees

Lee Taurman – executive vice president, global head of full-service commercial, Syneos Health

Lee Taurman is an experienced life sciences industry executive and management consultant. He specialises in working with clients to develop innovative solutions as they evolve to meet the needs of a changing healthcare and business landscape. This includes developing innovative services and solutions, reorganising and restructuring to better manage costs, and creating new approaches to strategic planning and execution that unlock shareholder value. Lee currently leads the Commercial Innovation Group at Syneos Health. Commercial Innovation leverages the company's broad commercial and clinical capabilities to develop integrated solutions that address clients' most pressing needs.

Prior to Syneos Health, Lee led Grant Thornton's advisory practice for Life Sciences. His work with clients focused on creating internal and external innovation platforms to deliver business value. He also developed strategies and execution models to harness the power of the "gig economy" and help manage an increasingly externalised non-employee workforce. He holds a Master of Business Administration from the Leonard N. Stern School of Business at New York University and a Bachelor of Sciences in Supply Chain Management from the Martin J. Whitman School of Management at Syracuse University.

Jeff Baxter – president and chief executive officer, VBI Vaccines

Jeff Baxter joined VBI in September of 2009. Previously, he was a managing partner for the venture capital firm, The Column Group. Until July 2006, he was SVP, R&D Finance and Operations, of GlaxoSmithKline (GSK). In his 19 years of pharma experience, he has held line management roles in commercial, manufacturing, and IT, as well as the office of CEO. His most recent position in R&D included responsibility for finance, pipeline resource planning, allocation, business development deal structuring, and SROne (GSK's in-house $125m venture capital fund). He also chaired GSK's R&D Operating Board. Prior to GSK, he worked at Unilever. He was educated at Thames Valley University and is a Fellow of the Chartered Institute of Management Accountants (FCMA).

About Syneos Health

Syneos Health® (Nasdaq:SYNH) is the only fully integrated biopharmaceutical solutions organisation purpose-built to accelerate customer success. It leads with a product development mindset, strategically integrating clinical development, medical affairs, and commercial capabilities to address modern market realities.

About the authors

Nick Kenny, chief scientific officer, Syneos Health, has over 21 years of experience in clinical development and consulting. Passionate about rapidly moving compelling new science for unmet medical needs through the development process to arrive at early and innovative decisions.

Nick has been with the company since 2006. He grew and led the Oncology team until moving to the CSO role in 2018 where he now oversees the Medical Team for Syneos Health, the Consortia Models for e.g. Rare Diseases, Cell and Gene Therapy, Patient Voice. Leads our Patient Diversity in Clinical Trials initiatives and is an executive leader on the DE&I Council. Senior representative to the Forum for Collaborative Research. Early career in biomedical research in the UK, US and Canada. Faculty appointment at the University of Vermont Medical School for several years. Past experience in biopharma consulting. Nick is a Cancer survivor (Hodgkin's Lymphoma). He is also president, board of directors, Hospice of Wake County.

Stephen Keith, MD, MSPH, senior medical director, Syneos Health has over 25 years of experience in biopharma industry in vaccines development (e.g. influenza Type B, meningococcal, pneumococcal, and Group B Strep. as well as diphtheria, tetanus, pertussis, and inactivated polio vaccines). Joined Syneos Health in 2018 as medical leader and also serves leadership role with Patient Diversity initiatives.

Previously, held C-level positions at 3 biotech companies, and was a general partner in a life sciences venture capital organisation.

Prior to entering the pharmaceutical industry, served as health policy advisor to the U.S. Senate Committee on Labor and Human Resources, under Senator Edward M. Kennedy. MD Pediatrician by training /practice, and RW Johnson Clinical Scholar at UCLA with qualifications in Public Health. Faculty member at the Charles Drew Medical School & UCLA School of Medicine (Pediatrics). Fellow of the Academy of Pediatrics, and Diplomate of the American Board of Pediatrics.Board of Directors of National Medical Fellowships, and Community Health Charities.

About Syneos Health

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Measuring the cost-effectiveness of vaccines targeting infectious diseases: Lessons learned from COVID-19

Cost-effectiveness modelling is a powerful tool in understanding the value health interventions can bring to populations. For vaccines that target infectious diseases, as Pragya Khurana and Dr Richard Pitman of ICON explain, cost-effectiveness research can power evidence generation and decision-making that helps keep people safe.

As the world saw with COVID-19, infectious diseases and the pandemics they cause can put immense strain on healthcare systems, particularly with regard to labour, resources, and funding. Nearly three years after the initial outbreak began, the UK's National Health Service (NHS) still feels the pandemic's burden. Even today, many patients have to wait 12 or more hours to be admitted to accident and emergency departments, and cancer patients are forced to delay treatment due to slim provider availability.

"By almost every measure of performance of the NHS, it's apparent that the system is under extreme strain," says Richard Pitman, PhD, lead health economist and epidemiologist at ICON. "In that environment, the cost of delivering services has increased."

To help manage the burden of infectious diseases, vaccines are a powerful public health tool, as well as a medical intervention, explains Pragya Khurana, epidemiologist at ICON. By reducing not only the inoculated person's disease risk, but also that of those around them, vaccines generate value for healthcare systems by reducing transmissions and improving patient outcomes.

But as pandemics evolve, healthcare costs shift, and more vaccines come to market, how do these environmental factors impact the cost-effectiveness of vaccines over time?

Health economics researchers such as Dr Pitman and Khurana use real-world evidence (RWE) to build cost-effectiveness models that demonstrate the value that vaccines bring to healthcare systems. With an increasingly strained NHS and a looming threat of additional pandemics, their research can inform policymakers' strategies for future vaccine rollout processes. By applying learnings from COVID-19 to build smarter cost-effectiveness models, there is much that healthcare researchers can do to improve the policy-level response to future public health emergencies.

An overview of cost-effectiveness modelling

Cost-effectiveness models help healthcare stakeholders weigh the cost of a medical intervention against the benefit it brings to people and populations.

"Within health economics," Khurana explains, "cost-effectiveness modelling seeks to establish which of a set of alternative interventions would provide the greatest health benefit to a population, given the amount of funding and resources available." The models are informed by a set of inputs, she continues, including the costs that are associated with the intervention itself and the savings that result from the reduction of disease.

To measure health gains, researchers use Quality-Adjusted Life Years (QALYs), "a unit that aims to standardise the value of health outcomes by the length and quality of life for patients," says Khurana. According to the UK's National Institute for Health and Care Excellence (NICE), one QALY is equal to one year of life in perfect health, meaning a person is able to carry out their normal activities free of pain or mental disturbance.

Cost-effectiveness, then, is often expressed as a ratio of the additional cost per QALY earned, or the incremental cost-effectiveness ratio, says Khurana.

Considerations for researchers building vaccine cost-effectiveness models

When studying the cost-effectiveness of a vaccine, researchers must take a variety of factors into account.

"When you do cost-effectiveness analyses, you construct a transmission model that tries to predict the number of future cases of an infectious disease that there will be under the current system, versus how many there will be if you introduced a new vaccine," Dr Pitman explains. These calculations also consider the ways the vaccine is deployed, such as how many doses are recommended in a regime, how many boosters are required to maintain protection, and the net impact of immunity in a population.

To gather the data needed to build these cost-effectiveness models, researchers have increasingly moved from clinical trial data to RWE.

"Clinical trial estimates of incidence of outcomes may not be representative of the patient experience in real practice," Khurana says.

Clinical trials, which occur in a highly controlled environment and include only people of certain demographic and health backgrounds, have often been criticised for their lack of representativeness. Instead, real-world data (RWD) – the raw information from insurance or administrative claims, electronic health records, patient registries, or other sources which, when analysed, becomes RWE – may more accurately depict health outcomes in specific regions because they include a wider group of the population.

RWE also offers a more holistic, often longitudinal view of patients' health over time, where clinical trial data represents a momentary picture of health outcomes during a specified time window. Health economists can select relevant, country-specific RWD sources to power their cost-effectiveness models in a way that represents the regions and populations they seek to understand.

In addition to data considerations, it's also important that health economists understand the country and health system-specific context that may impact the model and the decisions it seeks to inform.

For example, in the UK, Dr Pitman explains, the NHS operates within a fixed budget. This means that the NHS has a set amount of money to spend on health interventions, and, as a result, introducing a new intervention to NHS populations means that the funds used to purchase that product must be allocated away from another area within the health system.

These calculations are especially important when purchasing a vaccine to distribute to an entire population in order to ward off infectious disease.

"In order to justify spending money on a new vaccine and not on the other things that it would have been used for, the amount of health that you get from the new vaccine must exceed what would have been the benefit had that money remained in the health service," Dr Pitman says.

Using cost-effectiveness evidence to inform vaccine decision-making

Stakeholders across healthcare use information from cost-effectiveness models to shape their vaccine decisions.

For the pharmaceutical companies that manufacture vaccines, researchers may use RWD to feed models of how their company's vaccine impacts the ongoing transmission of a disease in the real world. These can be critical inputs to understanding the vaccine's effectiveness after it's approved. Then, given evidence of health gains, pharma could leverage the information to set a price for their product.

Cost-effectiveness evidence can be key for pharma leaders as they engage with regulators and payers.

"Pharmaceutical companies aim to provide evidence that their vaccine is as effective as it appeared in the clinical trials, then offer a price that would mean that their vaccine is deemed cost-effective by reimbursement bodies," Dr Pitman says.

On the other side of healthcare decision-making, regulatory and reimbursement bodies may use cost-effectiveness model outputs to apply a population health lens to balancing costs and health gains. In the UK, for example, the NHS must make decisions on behalf of about 40 million residents who are eligible to receive a vaccine. Therefore, not only must they assess the safety and efficacy of a vaccine, Dr Pitman explains, but they also must understand which choice of vaccines would provide the best control of the disease.

"They use cost-effective modelling as evidence to inform policy," Khurana says. "It's a very quantifiable way to evaluate the trade-offs and opportunity costs, not only from an economic and clinical perspective, but also from a societal perspective."

While patients may not perform cost-effectiveness research themselves, Khurana says, they feel the impact of the policy decisions it informs through the vaccines available to them and any subsequent effects on their or their loved ones' health.

"If vaccines are provided and allocated as efficiently as possible, it means you're getting the most increase in QALY, or you're allowing patients in other aspects of the health system to receive better health outcomes as well," Khurana says. "They're interconnected."

Importantly, cost-effectiveness research also raises the standard for future vaccines.

"The process of putting vaccines through that evaluation means there is a continual pressure for vaccines to be improved and for patients to get access to the best vaccines that the health system can afford," Dr Pitman says.

Findings on the economic impact of COVID-19 on UK healthcare resources

The severity of COVID-19 created a unique environment for vaccine development. "The early vaccines that were rolled out didn't have to go through formal cost-effectiveness evaluations because, in comparison to a baseline of no vaccine, they were going to have shown beneficial health outcomes in immunised individuals," Khurana says. "As long as those vaccines were safe, moderately effective, and not extraordinarily high priced, they would be deemed cost-effective."

However, introducing new vaccines into the COVID-19 environment became more difficult as the pandemic and vaccine standards evolved. For example, Khurana continues, as healthcare costs increased during the pandemic, so did the cost of a QALY. "This increases the economically justifiable price of a vaccine entering a more expensive healthcare environment," she says. "Especially in a fixed budget system, this means budgetary constraints."

A cost-effectiveness study from ICON investigated the increased healthcare costs caused by COVID-19 and how this may impact the cost-effectiveness ratio for new vaccines. Given the high cost incurred by the pandemic – estimated at £89 billion on health and social care – the cost of one QALY also increased. Therefore, if the cost of a QALY was about £30,000 before the pandemic, and now costs, for example, £60,000, this would mean that the same amount of money spent before the pandemic on a year of good health may now only achieve half of a QALY. While a new vaccine or other health intervention may be seen as cost-effective in this environment, due to budget squeezes and rising costs, it may not necessarily be affordable for a health system.

"There's tension between the idea of the affordability and the budget impact of a new vaccine versus its cost-effectiveness," Dr Pitman says.

In addition to the immense financial strain COVID-19 placed on all parties, the pandemic also posed novel challenges to the data scientists and epidemiologists involved in RWE research. For health economists like Khurana, "the general uncertainty around the epidemiological aspects of COVID made it difficult to forecast trends," she shares.

Researchers turned to learnings from influenza and other past infectious diseases to inform cost-effectiveness modelling efforts during COVID-19.

"We used a combination of statistical approaches to better understand the surveillance and administrative RWD, hand-in-hand with targeted studies, to provide the base data for the modelling that goes into cost-effectiveness," Dr Pitman says.

Though questions remain about COVID-19 and its impact – both on health economics and beyond – Dr Pitman acknowledges that "what you see in the data is the tip of the iceberg." Ongoing efforts from the Office of National Statistics and other groups to increase testing and data reporting have helped to make progress on gaining a full picture of COVID-19's effects on healthcare.

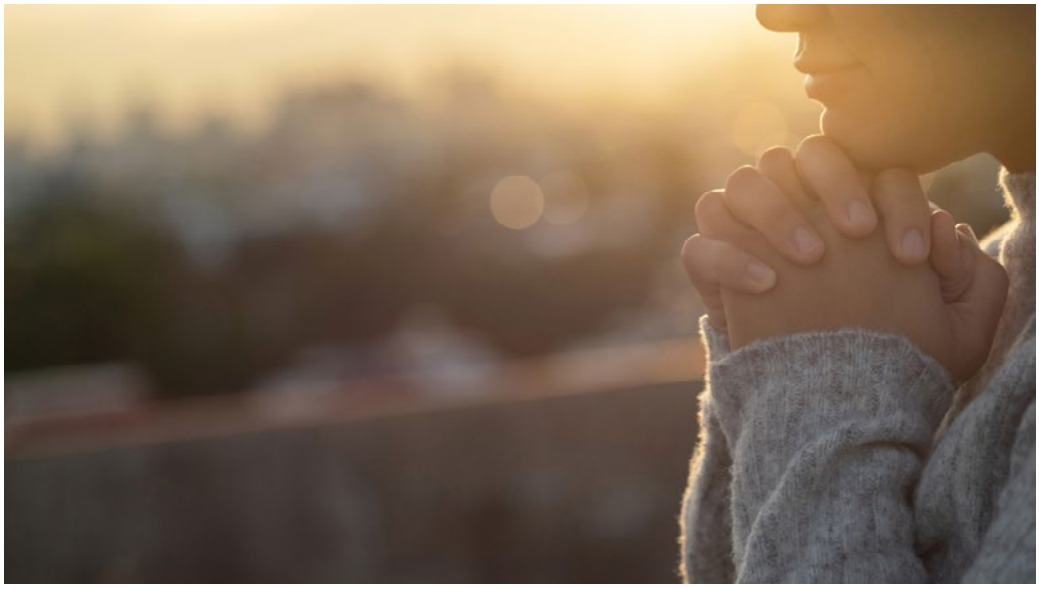
Looking ahead to future pandemics and the impact of cost-effectiveness research

Dr Pitman doesn't view COVID-19 as a once-in-a-century event, especially with an increasingly connected global population. The pandemic has, however, provided a "wake-up call" to emergency responders, and systems are being put in place to collect data quickly that can power cost-effectiveness models and further research to inform policymakers' decisions.

The response to future infectious disease outbreaks, Dr Pitman explains, must be holistic. While cost-effectiveness is a key measure as new interventions are introduced to the market, he says, "I wouldn't want people to think of cost-effectiveness as the be-all and end-all of public health in terms of vaccines." As new strains or new pathogens emerge, public health leaders must harness the lessons learned from COVID-19 to ensure an effective response.

"Overall, cost-effectiveness modelling is quite a powerful tool to quantify and take into consideration multiple factors that impact health and healthcare," Khurana says. "By combining that with some of the things we've learned from a societal perspective during this pandemic, we can gain the most insight moving forward."

Critically, this includes "a continual re-evaluation of vaccines and the health system in order to make sure that we maintain the necessary control – and remain prepared for things that might be thrown at us in the future," Dr Pitman says.



As global healthcare systems continue to recover from COVID-19, it's important to keep in mind the critical role that vaccines play in keeping people safe and healthy.

"Vaccines remain one of our most cost-effective interventions, but at the same time, because they're so good, they've become a victim of their own success," Dr Pitman says. Infectious diseases can have devastating effects, but because conditions like polio have been largely eradicated due to vaccines in high-income countries, people may forget about their contribution to the reductions in childhood mortality, improvements in general health, and increased standards of living.

"Those diseases haven't gone away. Maintaining people's faith in vaccines and the maintenance of national immunisation programmes is critical to our ongoing health," Dr Pitman says.

"My parting remarks," Khurana offers, "are to wash your hands and get vaccinated."

About the interviewees

Pragya Khurana, MPH, has focused on epidemiology and data analytics projects within the real-world evidence space. She has experience in multiple therapeutic areas, including oncology and infectious diseases. Pragya has a strong understanding of epidemiologic study design and conduct of analysis, and she has provided statistical programming support and insight at various RWE study stages.

Richard Pitman, PhD, has over 30 years' experience in the epidemiology, burden of illness, and mathematical modelling of infectious diseases, particularly relating to the cost-effectiveness of interventions and policy issues. Disease area expertise includes influenza, SARS, rotavirus, respiratory syncytial virus, tuberculosis, directly transmitted childhood infections, and HIV.

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