

Healthcare

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On the face of it, healthcare delivered another year of strong absolute growth in 2021, as the **S&P 500 Healthcare Index returned 25.2%, modestly underperforming the S&P 500 (28%)** but outperforming both the Dow Jones Industrial and MSCI World Indices. However, this masks significant underlying volatility, where the tide went out for more high growth, speculative and early-stage biotechnology companies, as evidenced by **ARK Genomic Revolution ETF -33% and SPDR S&P Biotech EFT -20%**. The NASDAQ Biotech Index fared better at 0.2%. What we saw was effectively the same dynamics we experienced in core technology. Excitement in underlying technology trends, however well justified, attracted an influx of capital from institutions, venture capital and thematic ETFs that drove valuations to unprecedented levels, especially in the more speculative areas. As the year progressed, **Covid beneficiaries began to lose their lustre as economies reopened, while Omicron kept a firm lid on any recovery in procedure and visits**. Rising inflation and higher yields catalysed the re-pricing of risk and duration in the latter part of 2021, with recent geopolitical tensions driving investors further towards safe-haven assets.

A year of progress

Share price performance aside, what we saw, and continue to see, is a **structural step forward in the adoption of technology** across healthcare. For example, in 2021 **Telehealth** providers had among the weakest share price performance, however by the end of Q1 2022 utilisation stabilised at levels **38 times higher than pre-pandemic**, with penetration ranging **from 13-17% across specialties**. All major health systems are working on a virtual primary care offering that will become part of the standard of care in time. Unfortunately, this has also resulted in business models being upended and a period of price discovery must ensue before companies can rebuild. Amazon recently announced the integration of telehealth services into their voice-controlled assistant Alexa, promising to drive usage even further.

Remote monitoring is becoming more viable due to the improvements in device technology and communication infrastructure alongside Covid-necessitated **digital transformation** across health systems. Staff shortage – from illness, burnout and the proliferation of opportunities elsewhere – has become a huge issue for healthcare providers globally, not to mention wage inflation and the need to minimise close-contact interactions. Technology and automation can go a long way in relieving this bottleneck. We are not alone in observing this trend. **Microsoft acquired Nuance Communications, a voice and AI-based patient record platform, for \$19.7bn, while Oracle paid \$28bn for Cerner, an electronic health record provider**. Biopharma companies are also going more digital, with more of their marketing efforts and dollars now directed towards digital channels.

AI is proliferating across healthcare, from drug discovery to trial design, therapy optimisation to predictive screening. These trends have a common thread – **they generate and utilise a great deal of data**. This will be fed back into the system to continuously improve outcomes and this data advantage will help these solutions go from being supplements today to the gold standard in the future, a trajectory we have observed time and time again in other areas of technology.

The future of connected devices

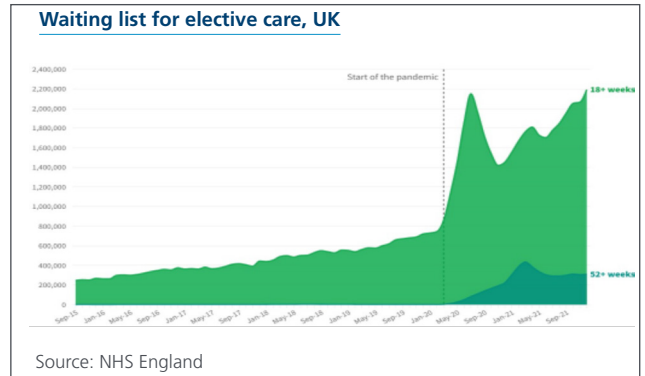
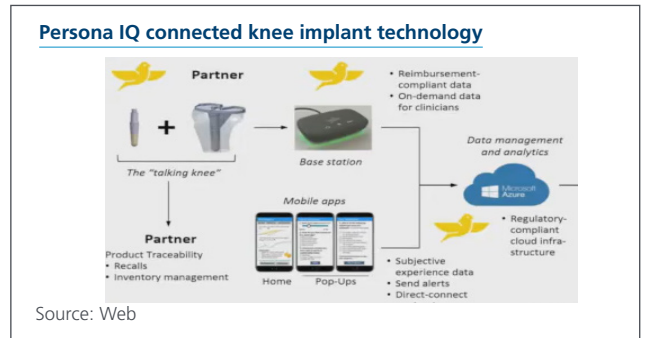
In January 2022, Abbott became the first healthcare company to deliver a keynote speech at CES (Consumer Electronics Show). They used the consumer technology conference to introduce Lingo, a broad platform for wearable technology that builds on their existing glucose monitoring technology in their Libre sensor for diabetics. Biowearables, as they are known, initially targeted exercise and the simple measurement of certain vital signs but are now emerging to solve more complicated late-stage pipelines. The market potential is huge – **the wellness market is estimated at \$1.5trn, while 42% of consumers consider it a top priority as an area of spend**. Tim Cook famously claimed that Apple's "greatest contribution" will be seen in healthcare and the Apple Watch has been a hugely successful initial spearhead into expanding the wearables market, generating an estimated \$20bn revenue in their 2021 financial year. Whoop fitness bands saw a marked rise in popularity after being able to successfully identify professional golfers who had contracted COVID-19 before appearing symptomatic, via subtle changes in resting respiratory vital signs.

We have written before of our excitement for **Dexcom** and **Abbott** who have managed to deliver perhaps the greatest advancements in wearable technology, with continuous glucose monitoring (CGM) providing a better standard of diabetes care than existing clinical norms via

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a wearable that best suits consumers. **Apple** have long been rumoured to be working on watch-based, non-invasive glucose monitoring in combination with Rockley Photonics, however the reality is accurate sensing is incredibly hard, even invasively. Medtronic is the other large CGM player and has been a continuous share donor due to poorer accuracy and an inferior device. The next stage for all these companies is to unlock the value in the datasets they are gathering. The potential of **AI and machine-learning (ML) techniques to deliver more personalised solutions to consumers** based on their blood sugar levels, sleep patterns or cardiac rhythm is enormous. We expect this to be an area of significant investment over the coming years, with a focus on building the technology platforms to deliver complementary analytics for the hardware.

One company that has already realised a product aligned with this vision is Canary Medical which has brought the Persona IQ knee implant to market in partnership with Zimmer Biomet. This is a connected implant that feeds data such as step count, gait, range of motion and balance back to physicians to monitor patient recovery after surgery. This can not only identify post-surgical complications and keep patients on track, but it also creates a **digital twin of the knee replacement**. In essence, it provides failure prediction and **predictive maintenance for knee replacements**. Technologies like this will be required to unburden hospitals as much as possible in the face of a backlog of care delivery post-pandemic. The UK has some of the most comprehensive data and this shows the **number of patients waiting for elective care has risen 37% compared to pre-pandemic levels, with a 194% increase in patients waiting 18 weeks for elective care**. Predictive care can also ease this backlog by reducing the number of patients entering the system at the most acute stage. CGM can prevent diabetics from hypo- and hyperglycaemic events, and heartbeat analysis can identify patients at a high risk of heart attack.

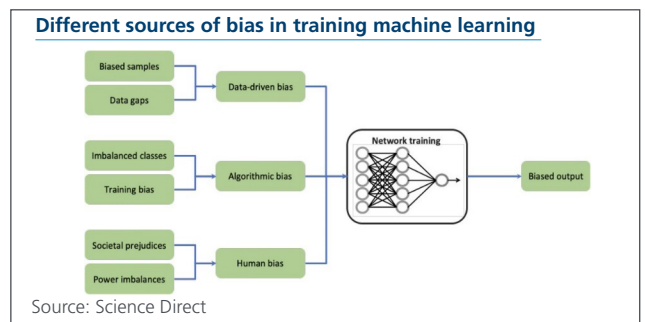


ESG

When assessing ESG considerations for healthcare companies, there are a number of sector-specific issues above and beyond the normal risk factors that we would monitor.

Product recalls often have severe implications for healthcare companies. The sector typically has high exposure to products that are required to meet highly regulated safety standards as well as standards for manufacturing facilities and supply chains. Failure results in financial penalties, lost revenue opportunities, a heightened risk of class-action lawsuits, requires investment to rectify and a material negative impact to components of the social metrics in many ESG score matrices.

Many of the risks healthcare companies face as the industry digitises mirror those facing technology companies, with perhaps an increased burden with respect to **data security and privacy**, given the sensitivity of the data involved. However, with AI and ML utilisation rising across the industry to tap the potential of big data, there are risks in ensuring the relevance of the data involved and the applicability of results as well. **Bias in AI algorithms** used in healthcare could have catastrophic consequences by propagating deeply rooted, sometimes unconscious societal biases. These could result in subsequent failures, such as misdiagnosing certain patient groups (on the basis of ethnic background or gender, for example) and then algorithmically compounding the existing inequality. The industry is still in the early stages of adopting AI/ML techniques and the risks involved are becoming better understood. Open science practices are being developed to help combat this, emphasising diversity in data collected as well as in the professionals responsible for running studies and creating the algorithms. Algorithmic advances are being developed to try and adjust for biased collected and historical data, although this is an as-yet unproven approach.



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