

# PERSPECTIVAS

## LONGEVITY IN FOCUS



**"The great thing about getting older is that you don't lose all the other ages you've been."**

*-MADELEINE L'ENGLE*

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# Foreword

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Chief Innovation Officer &  
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## WHAT KIND OF WORLD DO WE WANT TO CREATE AS WE EMERGE FROM THIS PANDEMIC?

Our view is that Covid will only accelerate many of the previously established trends transforming systems and societies. And that technology and innovation are set to play an increasingly pivotal role in how we adjust.

We call some of the most profound and important trends of our times – the “unstoppables.” They are at once – large and broad-based disruptions shaped by long term and secular forces with the power to have significant ramifications for wealth management and creation.

One example would be the trends resulting from global population growth. Driven in large part by advances in medicine and medical care, people are living longer lives. In fact, the global population aged over 65 is set to more than double in the next 30 years!\*

And whilst this isn't a new phenomena it may come as a surprise to hear that we are just beginning to see all the ways that this massive demographic and technological shift can impact not only the health care sector but the broader global economy.

This presents a vast array of opportunities while also bestowing some challenges. With a scarcity of the many doctors, clinicians and affordable services needed to care for this aging population, the world is set to unleash a large amount of resources dedicated to meeting the demands of this growing trend. At the same time, the expected explosion of people needing increasing access to health care may require questioning the status quo. Abandoning a one-size-fits-all approach to primary care and embracing different care models that make better use of physicians, are targeted at specific populations, offer non-physician but still high-quality care when appropriate, and makes use of a much broader deployment of digital technology to power personalized, preventive healthcare<sup>1</sup> – are all questions that are likely to receive increased attention in the years ahead.

So in this edition of *Perspectivas*, we will deep dive into why we believe that the transformation in the health care sector can play a pivotal role in portfolios (on page 4). On page 6, we highlight the pinnacle of *The Golden Age of Personalized Medicine* we're currently experiencing and explore some cutting edge innovations that are underpinning this powerful unstoppable trend. For example, did you know that Covid treatments could act as a template to address therapeutics for

other auto immune diseases? This and other breakthroughs are bound to transform the way we live and make the world a better place, as evidenced on page 8, *Paving the Way for Improvements in Cancer Treatments*.

While no opportunity comes without challenges (also discussed on page 6), the opportunity set in health care is vast. On page 10, we introduce some of the opportunities we see in medical devices and robotics as well as wearable technologies, which are allowing people to live healthier lives by helping them better manage (and detect) chronic illnesses and other life-threatening events. Nonetheless, the impact of this unstoppable trend traverses to other sectors as well. Longevity is also poised to leave its mark on large tech, communications, and real estate companies (among others). On page 12, we delve into some of the impacts that Longevity could have on other sectors and discuss how the health care field can disrupt current norms.

Governments are expected to invest heavily in this space. Prior to the pandemic, the United Nations had called upon governments worldwide to implement policies to address the needs of the ageing population. One area of focus was designing public services specifically catered to older persons' needs – access to proper health care being one of them. Adding impetus, today, the global health crisis has exposed vulnerabilities in the health care sector for many countries and highlighted opportunities that could have a long lasting impact.

If the above isn't enough, consider this:

- Already 6 out of every 10 people say they would choose to use digital doctors for primary care.<sup>2</sup>
- About 1 in 5 American use a smart watch or fitness tracker. And roughly half of those are comfortable sharing this data with researchers<sup>3</sup> – providing a massive new source of insights.
- Cancers not currently screened-for account for 70% of deaths. A more generic test that relies on a simple blood sample could open the door for multicancer early detection technology.<sup>4</sup>

So, are you ready to enjoy the fruits of your Longevity? We encourage you to reach out to your Financial Professional to discuss ways we can help you align your portfolio to this and other unstoppable trends.

\*By 2050, the global population aged over 65 is set to reach 1.5 billion (1 in every 6 people) from 703 million in 2019 (1 in every 11 people). And the “very senior” cohort (those aged over 80) is likely to increase even more rapidly, from 143 million to 426 million - Citi Private Bank Outlook 2021. While no investment is ever guaranteed and no trend lasts forever, an “Unstoppable Trend” is Citi Private Bank's label for a powerful multi-year phenomenon that is transforming business and everyday life. As disruptive forces, they can create both risks and opportunities for your portfolio.

<sup>1</sup>Harvard Business Review. <sup>2</sup>Based on responses from Accenture's 2020 Digital Health Consumer Survey. <sup>3</sup>Pew Research Center. <sup>4</sup>The American Journal of Managed Care. Sources: Citi Private Bank, United Nations, World Health Organization. Chart and images are for illustrative purposes only. For additional information, please refer to the Disclosure section at the end of this publication.

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# The Role of Health Care in Portfolios

## EXPOSURE TO AN UNSTOPPABLE TREND

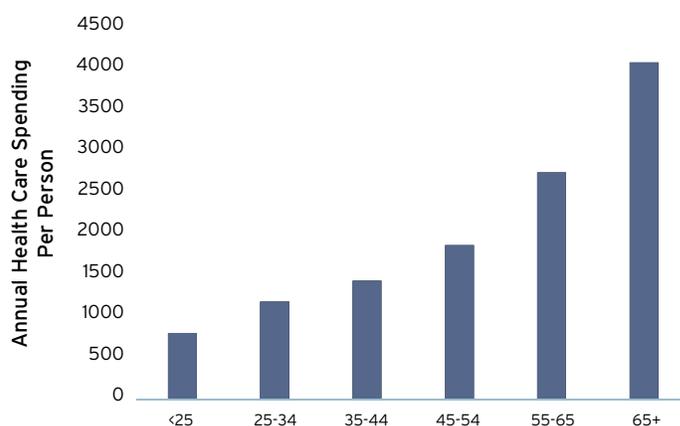
As we begin to see the end of the Covid crisis, one theme will continue to persist: the world's population is getting older and is slated to grow considerably in the coming decades. As the average global citizen ages, so too will the costs associated with taking care of the global population (FIGURE 1). We believe this growth driver will provide a tailwind to earnings in the health care sector for years to come.

In the future, not only is the aging trend set to accelerate in developed markets, but we also expect that an explosion in the size of the emerging world's middle class will lead to significant demand for drugs, medical devices, and health care services. Populations in China and India are experiencing a massive shift into the middle class where families can move past fears of poverty and are now able to spend more on health care, thus substantially adding years to their life expectancy. In mid-2017, the emerging world middle class was around 3.3 billion people—a number that is expected to reach 5 billion by 2027.

## LONG-TERM EARNINGS GROWTH POTENTIAL

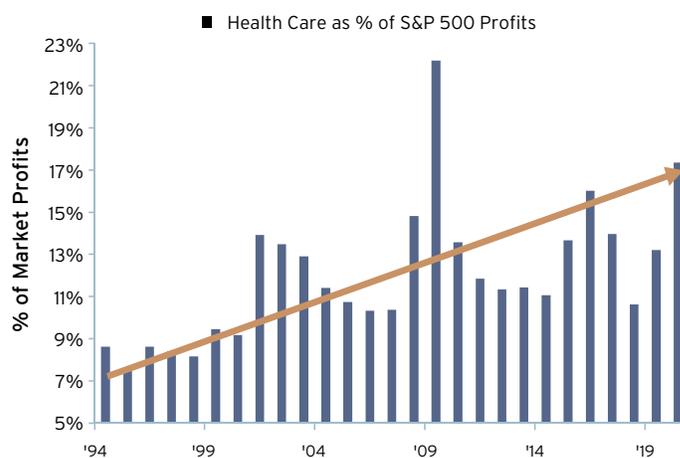
As it stands today, the health care sector in general tends to boast resilient earnings (FIGURE 2), strong balance sheets and consistent free cash flow that has grown as a share of the broader market. Indeed, the Health Care sector is expected to contribute to 16% of S&P 500 profits in 2021, but consists of just 13% of market cap. Much of the sector's current profits come from large cap pharmaceuticals, medical devices firms, and health care providers like insurers. These industries also tend to pay higher dividend yields. Meanwhile, more growth-oriented segments like small cap biotech, life sciences and health care technology tend to trade with higher valuations on the hopes of new breakthroughs and innovations in health care delivery down the road. In this regard, the health care sector provides a natural "barbell" of both robust current cash flow and long-term earnings growth potential (FIGURE 3).

Figure 1. Health Care Spending by Age



Source: Factset as of June 30, 2021.

Figure 2. Health Care sector earnings are stable and rising as a share of equity market profits



Source: Factset as of July 15, 2021.

## LOWER VOLATILITY AND ATTRACTIVE VALUATIONS

Unlike many other “growth” equities, the health care sector tends to trade with more defensive characteristics. As investors’ concerns grow around elevated valuations and the impact that rising rates could have on market volatility, health care can serve as a relatively safe allocation within equity portfolios. Indeed, over the past 25 years, the health care sector has been the 2nd best performer globally (12% annualized), with the 3rd lowest volatility across global sectors. The sector also tends to sell off less during market corrections, therefore outperforming both during bouts of market volatility and also over the long-run.

Not only has health care typically traded with less volatility than the broader market, but U.S. and global health care

shares trade close to historic lows in valuation when compared to other equity sectors – providing an attractive entry point for the sector, **FIGURE 4**. During the US-led recovery from last year’s equity bear market, 10 out of 11 US sectors trade richer to their non-US peers. The 11th sector, health care, is unique in the fact that US shares trade at a discount to non-US peers (**FIGURE 5**), presenting an interesting way to maintain exposure to a fast-growing segment of the US equity market without having to chase valuations higher.

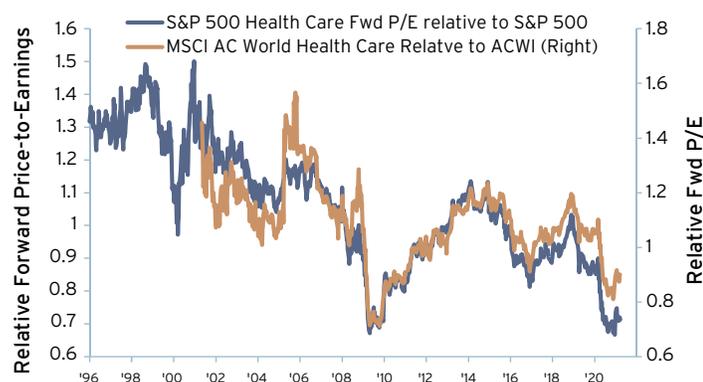
At Citi Global Wealth, we believe investments in health care play a unique role in portfolios: providing exposure to a long-term growth opportunity and doing so with lower volatility and attractive valuations.

**Figure 3. Global Health Care Industries**

Health Care Industry	Market Cap (\$bn)	Div Yld (%)	P / '21E	US Revenue Exposure (%)
Pharma	2,780.17	2.70	14.61	42%
Equipment	1,771.27	0.78	29.41	47%
Providers	1,085.70	1.26	14.65	90%
Biotech	997.61	1.78	14.33	65%
Life Sciences	617.68	0.19	32.84	43%
HC Tech	118.11	0.27	60.63	48%

Source: Factset as of July 15, 2021.

**Figure 4. Health Care valuations have fallen to 10-year lows relative to broader equity markets**



Source: Factset as of July 15, 2021.

**Figure 5. US vs non-US Forward P/Es by Sector**

Sector	US	Non-US	US Premium Discount
Energy	17.0	9.7	76%
Cons Discr	33.6	19.5	72%
Materials	17.4	11.1	57%
Comm. Svcs	24.0	17.5	37%
Utilities	19.0	13.9	37%
Financials	13.9	10.4	35%
Info Tech	28.5	21.9	30%
Industrials	23.6	19.3	22%
Cons Stap	20.6	20.7	-1%
Health Care	18.1	21.8	-17%

Source: Factset as of July 15, 2021.



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*with special thanks to Tish Maxwell*

# Innovation, Breakthroughs and Challenges in Medicine

According to John Hopkins University & Medicine, a typical vaccine development timeline takes five to ten years, and sometimes longer, to assess whether the vaccine is safe and efficacious in clinical trials, complete the regulatory approval processes, and manufacture enough vaccine doses for widespread distribution. The global pandemic highlighted the importance of innovation and collaboration, especially in the health care sector, as companies were met with challenges for a quicker solution.

Perhaps the most significant advancement during this time has been the success of messenger ribonucleic acid (mRNA) technologies. While the technology has been around since the 1990s, mRNA became a household term following the rapid approval and administration of mRNA vaccines to combat Covid-19. Prior to the pandemic, mRNA technology had been evaluated in early-stage clinical trials for many years, but the clinical research had not yielded an approved vaccine.

This quickly changed as mRNA vaccines were the first to be approved in many countries across the globe, including the United States. The technology is ideally suited for a pandemic as it allows vaccine development to be rapidly accelerated. We believe these technology platforms have the potential to be utilized against other viruses, such as the flu. Additionally, they may even work on more challenging targets, like certain types of cancer, in the years ahead!



## THE GOLDEN AGE OF PERSONALIZED MEDICINE

The future of medicine is also increasingly evident in the biopharma and diagnostic space. With the cost of **genome sequencing** continuing to decline and liquid biopsies - biopsies that use a routine blood sample - becoming more pervasive, we are entering the golden age of personalized medicine. Why is this important? Throughout history, health care has typically focused upon treating people with a one-size-fits-all remedy only after they fall sick. However, breakthroughs in our understanding of DNA will increasingly enable a more preventative approach based on an individual's genetic make-up. Personalized medicine seeks to identify an individual's susceptibility to disease, prevent disease if possible, detect problems earlier on, and then customize treatment. We are already seeing the benefits of personalized medicine across several therapeutic areas, particularly for cancer treatment.

In addition to the innovation in the scientific field, the global pandemic brought about many changes in our lives, including how and where we access health care services. One significant acceleration we have seen has been the advancement and acceptance of telehealth. Telehealth allows people to access both physical and mental health services from the safety and privacy of their homes. While telehealth was an option prior to Covid-19, the pandemic is estimated to have accelerated the trend towards telemedicine by 10 years. We believe telemedicine will continue to gain market share in the health care services space in the years ahead, particularly as the regulatory barriers continue to decline and more consumers become comfortable with the experience.



### DID YOU KNOW?

Whole **genome sequencing** is a comprehensive method for analyzing and decoding an organism's DNA. Launched in 1990, the Human Genome Project (HGP) set out to identify the order, or sequence, of all DNA bases to obtain the 'genetic blueprint' of humans.

In 2001, two pivotal publications reported the first drafts of the human genome, setting the stage for the genomic era. The second phase of the project, which moved from the drafts to an essentially finished reference genome, was completed in 2003 by a group of about 40 professionals who publicly declared their support for the free and unrestricted use of genome-sequencing data by the scientific community. This declaration, known as the Fort Lauderdale Agreement, enshrined the collective responsibility of funding agencies, resource producers and users to maintain and expand a communal trove of genomic data. These principles were later implemented as policy by several funding agencies, notably the US National Institutes of Health (NIH), which today still mandates rapid data-sharing in its grant requirements.

Today, the HGP remains notable for the paradigm shifts generated by this publicly funded 'big science' project—one which has a revenue potential of greater than \$800 billion. Offering a first view into the entire human genome, the HGP acted as a gateway to an era of significant input into digital biology, ushering in rapid technological and computational developments and team-oriented research, the fruits of which continue to be felt across the clinical and life sciences fields today.<sup>1</sup>

## CHALLENGING NORMS

Government budgets around the world, already tested from the massive and unexpected costs related to the pandemic, will be stretched further as we emerge from the pandemic. This will require an even more stringent focus on overall health care costs, and we believe this will lead to a shift towards outcomes-based health care, a health care delivery model in which providers, including hospitals and physicians, are paid based on patient health outcomes. In the US, we are seeing a move away from fee-for-service towards outcomes-based care as a means of improving patient outcomes while reducing health care costs.

Historically, U.S. health care has been largely focused on helping the sick restore their health. With the shift to outcomes-based health care, we see the potential for a system that maintains a healthy population and prevents illnesses.

The challenge is that an outcomes-based framework requires a deliberate and industry-wide restructuring, further complicated by the lack of a standard for a value-based approach to care delivery. However, there is broad agreement among health care leaders that health systems must embrace outcomes-based health care - despite the challenges associated with changing the way they do business.



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# Paving The Way for Improvements in Cancer Treatments

Advances in the understanding of genomics are changing the way we treat disease. Scientists can now harness their knowledge of the human genetic code to identify “targets” that play a role in the cause of a disease. This is leading to the creation of targeted therapies that treat diseases more effectively.



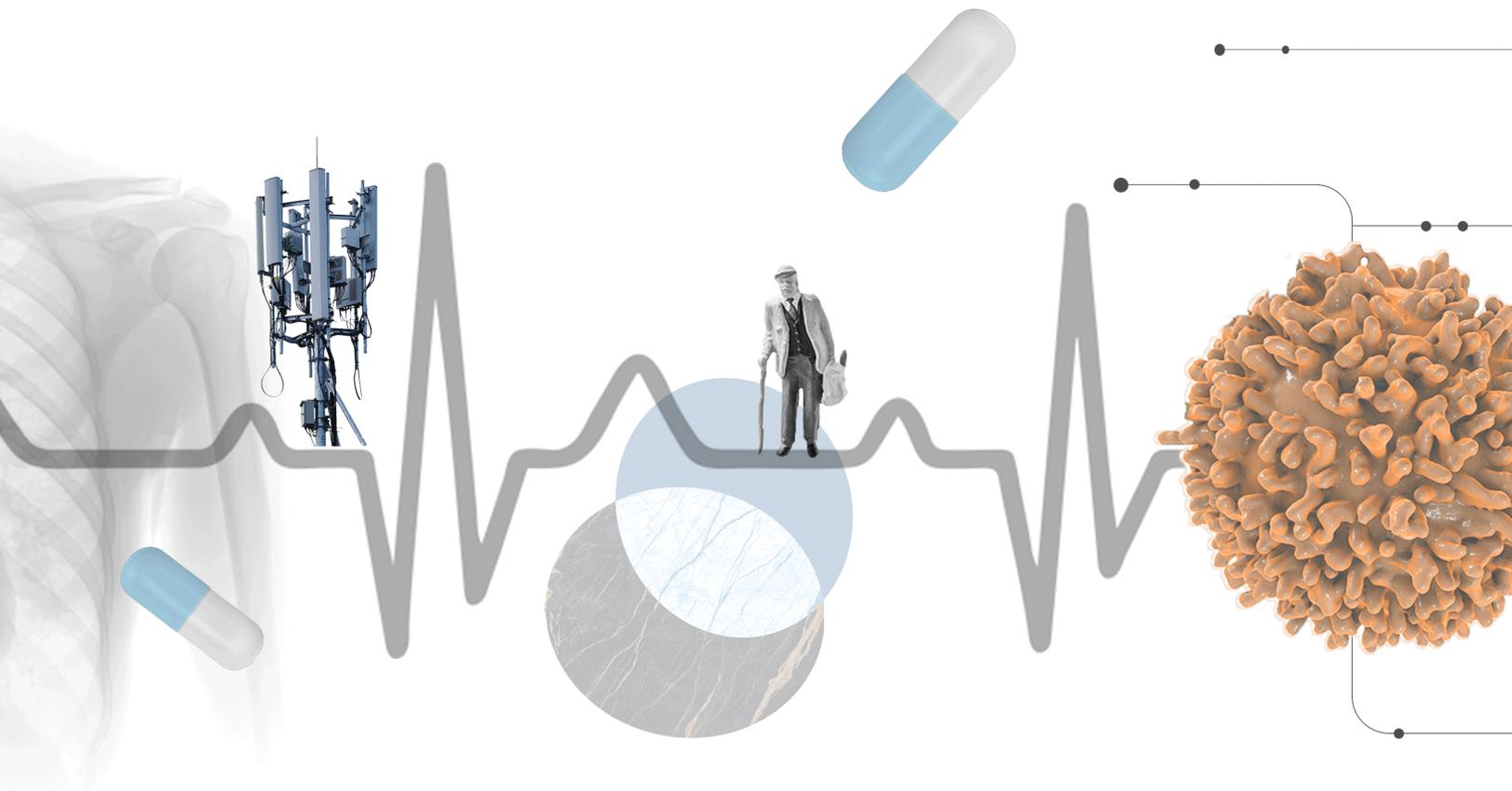
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Historically, many types of cancers were treated with chemotherapy and radiation. While both remain important therapeutic options for treating cancer, they do not discriminate between healthy and cancerous cells, attacking both. Now, thanks to the targeted therapeutic capabilities developed using human genomics, there are advanced treatment options in oncology. Targeted cancer therapies can more effectively fight cancerous cells while preserving healthy ones, which can result in better outcomes for patients.

One example is the evolution in treatments for certain types of lung cancers. Overexpression and mutation of the epidermal growth factor receptor (EGFR) is present in various cancers, including forms of lung, breast and brain cancer. Lung cancer remains one of the leading causes of cancer-related deaths among both men and women, and the most prevalent form is non-small-cell lung cancer. Advanced stage non-small-cell lung

cancer has been difficult to treat historically, due to a lack of understanding of what was causing the cancer to grow and spread. Thanks to genomics, scientists now better understand the changes in the EGFR gene that trigger or support abnormal cell activity. As a result, it is possible to create targeted therapies which interfere with, and ultimately correct, the affected signaling pathways that allowed abnormal cells to grow and flourish in the body.

The use of genomics to drive biomedical innovations such as targeted cancer therapies is a great example of the new capabilities being developed across the biopharmaceutical industry to address unmet medical needs. As understanding of the science behind diseases continues to evolve, so can the technologies for treatment, which should drive healthy growth for the industry over the longer term.





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# Opportunities in Health Care

Much attention has been focused on the global pharmaceuticals space, particularly in light of positive vaccine news and the new Administration in the U.S., which may have implications for drug pricing through drug price reform.

Global pharmaceuticals remain an attractive sub-sector within healthcare. Visibility into near-term revenue and earnings for most large pharma companies is strong, based on each companies' portfolio of commercialized products. In addition, many companies have done a fantastic job of revitalizing their pipelines in recent years, which will help to drive the next wave of innovation across various diseases, including Alzheimer's, Type II Diabetes and different Cancers.

## MEDICAL DEVICES & ROBOTICS

Another area of health care we find particularly interesting is the medical device industry. The medical device industry offers the opportunity to play both offense and defense within health care as these companies potentially benefit from the reopening of the economy and provide products that improve patient health outcomes.

In the first half of 2020, elective procedures were dramatically reduced as hospital systems around the world were overwhelmed with treating Covid patients. During that time, the sale of medical devices used in surgical procedures declined, pressuring the stock prices of leading medical device companies. However, hospitals have since implemented safety protocols that have mitigated the decline in procedures, even during the most recent Covid-19 case spikes. While procedure trends overall have improved, there is significant pent-up demand that we expect to continue well into 2022 as patients become more comfortable with returning to hospitals.

Beyond the demand aspect, the level of innovation across many medical device companies continues to be robust. One area we see as particularly interesting is trans-aortic valve replacement therapy, or TAVR. TAVR is a minimally invasive surgery that displaces the more invasive open-heart surgery to address aortic stenosis (a narrowing of the aortic valve opening that restricts blood flow to the heart). We are also excited about robotic surgery as the total addressable market (TAM) of eligible surgeries (i.e. prostate surgery) is significant and penetration rates are still low.

## WEARABLE TECHNOLOGY

The absence of regular doctors' visits during the pandemic has also led to the increased need for remote monitoring using innovative devices. Wearable technologies - such as smart watches - are now helping give early warnings of health issues, as well as monitoring existing conditions and events. These include cardiovascular disorders, diabetes, epileptic fits, and falls suffered by the elderly in their homes.

Wearable technologies can also help a user monitor for the correct and timely ingestion of medicines and allow for early identification of silent, but potentially fatal changes in patient function, including arrhythmias and pre-stroke brain activity. For diabetics, the timely and accurate administration of insulin is being aided by insulin pumps and continuous glucose monitors that provide an ongoing, more accurate reading of blood sugar levels and reduces the risk of life-threatening hyper- or hypo-glycemic events.

Most recently (to offer another example), hearing aids have also received an artificial intelligence (AI) upgrade. Some of the latest hearing aids interact with smartphones and are



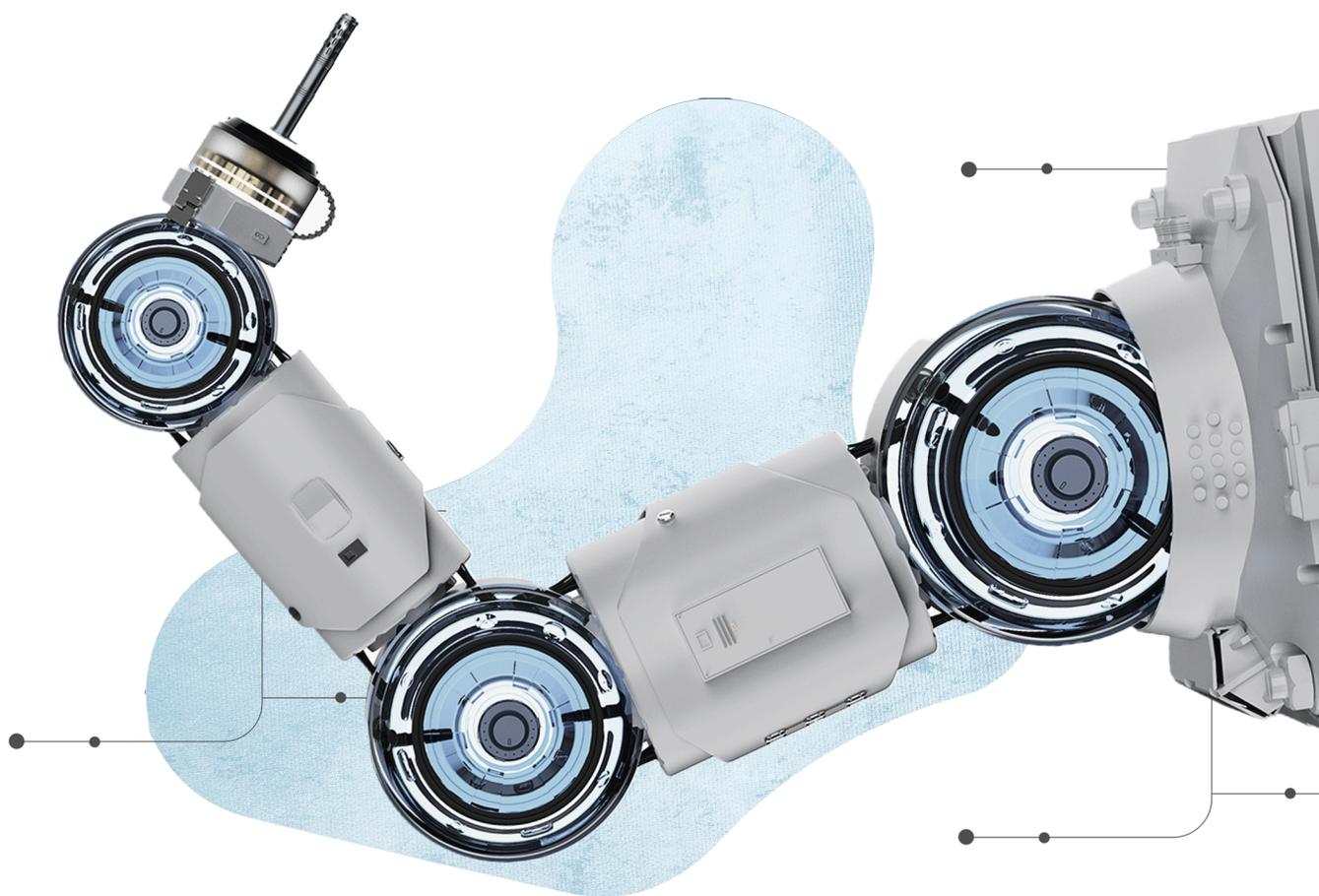
## DID YOU KNOW?

There are face mask models now in testing that do more than just provide a physical barrier between the wearer and potential viruses. Scientists and engineers have created working prototypes of masks that include diagnostics, sensors and even the ability to kill viruses.

Researchers at Harvard University's Wyss Institute for Biologically Inspired Engineering have figured out how to integrate a freeze-dried diagnostic Covid-19 test into a face mask that reacts with exhaled particles and gives a diagnosis in 90 minutes or less!<sup>2</sup>

designed to look no different from sleek music-streaming earbuds. And like some other app-based hearing devices, many hearing aids now use smartphones' processing power to enable machine learning, allowing the wearer to adjust their hearing to different settings.<sup>1</sup>

We believe life science tools companies, along with lab equipment and services companies, are well-positioned to benefit from ongoing surveillance and testing with their increased base of equipment. In addition to Covid-19 related surveillance, we expect governments will leverage their new diagnostic infrastructure to more readily screen for various viruses, including the flu and hepatitis C, which creates the opportunity to improve patient outcomes.





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# Impact of Longevity on Other Sectors

## BIG TECH JOINS THE HEALTH CARE PARTY

When one or more American tech giants announces that it plans to enter a new industry, current industry players (and their shareholders) tend to shudder. Think of Apple's entrance into streaming, Amazon's purchase of supermarket chain Whole Foods, and Google's investments in self driving cars. These are just a few examples of companies aimed at building market share in industries adjacent to their core competencies, but which could provide other avenues for sustaining rapid growth.

It should come as no surprise then that several big tech companies have announced plans to enhance their investments in the health care arena, as they too have identified the growth opportunity present in this space. Each big tech player is likely to approach its investment in the space differently, with some working on drug delivery and telemedicine, and others turning to developing devices and analytics to improve consumers' overall health and lifestyles.

While big tech's advancements in the health care field certainly have the potential to disrupt the current system, we believe the growing pie of demand for health care products and services is big enough to sustain existing players and new entrants alike. In fact, big tech companies may choose to partner with leaders in each field to gain expertise and ensure regulatory compliance.

## AI + 5G + WEARABLES = LIVES SAVED

Heart attacks are among the most common causes of death globally. Strokes are also all too common, and just as spontaneous. What if we told you that the number of sudden episodes like heart attacks and strokes could be dramatically reduced in the near future? That is the focus of significant research in the health care technology space, where a combination of wearable devices, rapid communications, and machine learning will be able to detect heart attacks and strokes before they occur, perhaps saving thousands of lives each year.

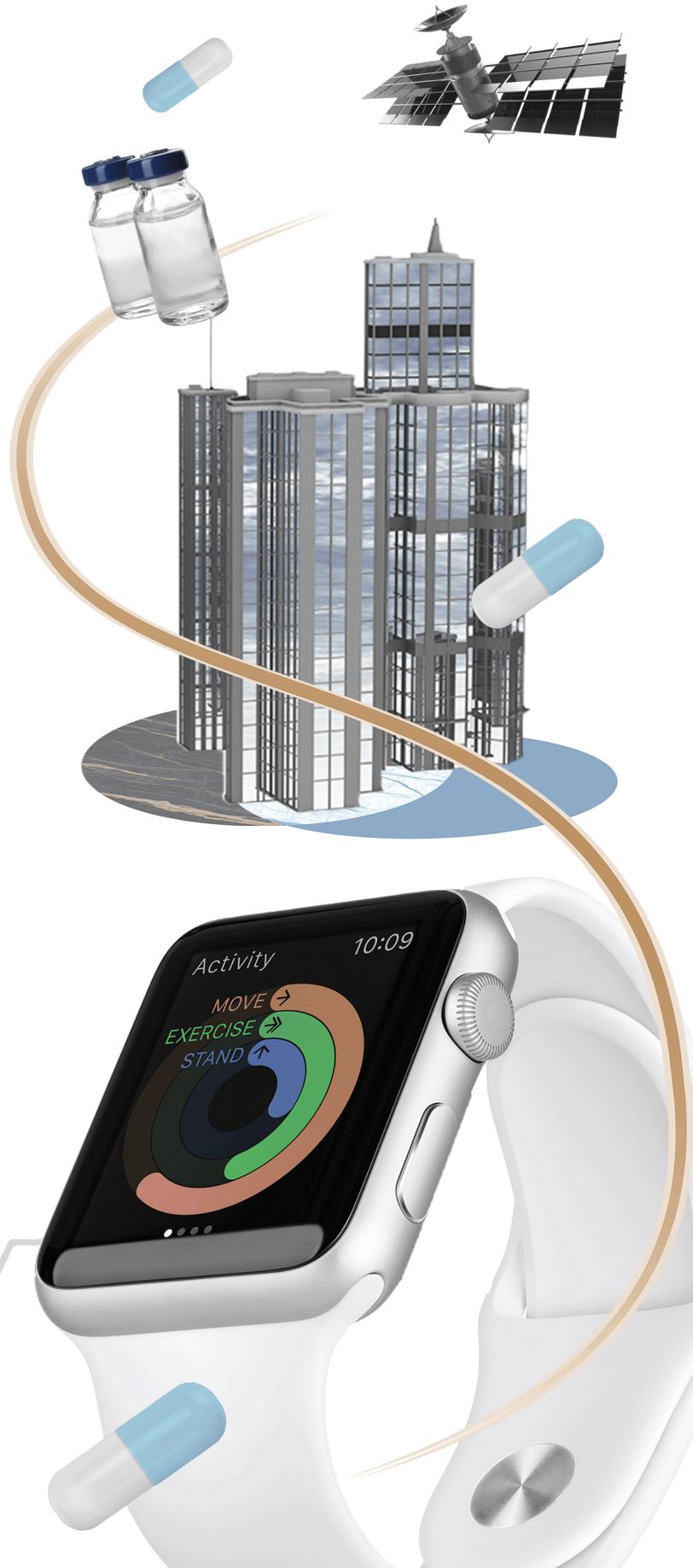
A wearable sensor, for example worn around an individual's wrist or chest, can be deployed to monitor vitals and detect neurological transmissions on an ongoing basis. That information is then transmitted to an app on the person's smartphone, where it can then be sent to a remote server or database where the data is analyzed in real-time to detect anomalies between the individual's vitals and those of patients who have previously experienced serious episodes. Like social media usage or credit card data, the more data that can be collected and analyzed for a specific person and across different demographic groups, the better and more nuanced remote monitoring services will become - improving their accuracy and precision.

## HEALTH CARE REAL ESTATE: LONGEVITY MEETS THE COMPLEXITIES OF COVID-19

The publicly traded real estate sector is about as diverse as the global economy itself, with owners of residential and commercial properties touching every element of our day-to-day lives. So it should come as no surprise that a notable portion of the equity REIT (real estate investment trust) market consists of companies solely focused on owning and operating health care facilities. The health care real estate market is quite diverse in its own right, with the largest REITs managing large portfolios of nursing homes, hospitals, medical office buildings, laboratories, and skilled nursing facilities. We believe these types of properties are poised to experience significant growth in the coming years, as demand for both routine and long-term care grows along with an aging global population.

Now enter Covid-19, a disease that tragically had a disproportionate impact on the world's elderly and immunocompromised. The Covid Tracking Project estimates that nursing home residents and staff comprised nearly 40% of all deaths related to Covid-19. Meanwhile, hospitals experienced several waves where capacity was overrun by Covid patients, limiting their ability to provide regular care. However, the diversity of property types in the medical real estate space has been a key strength, as demand for lab and medical office square footage continued to grow throughout the pandemic. We believe that ongoing growth of laboratories and medical offices, coupled with a recovery in nursing home occupancies and hospital operating margins make the health care real estate space an interesting arena to gain additional exposure to this long-term theme beyond the traditional health care equity sector.

Sources: Citi Private Bank. Chart and images are for illustrative purposes only. Historical analysis and past performance is not indicative of future results. All forecast are expressions of opinion and are subject to change without notice and are not intended to be a guarantee of future events. For additional information, please refer to the Glossary and Disclosure section at the end of this publication.



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