



# Silver Tsunami

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# Advancing Health Through Science and Technology Innovation



**Paul Stoffels**  
Vice-Chairman of the  
Executive Committee  
Chief Scientific Officer  
Johnson & Johnson

Over the past century, thanks in large part to advances in science, technology and medicine, the average human life expectancy has more than doubled. The pharmaceutical industry has played an important role in these advances by translating basic scientific insights into tangible solutions, and thus has delivered significant value to society in the form of years of life and quality of life.

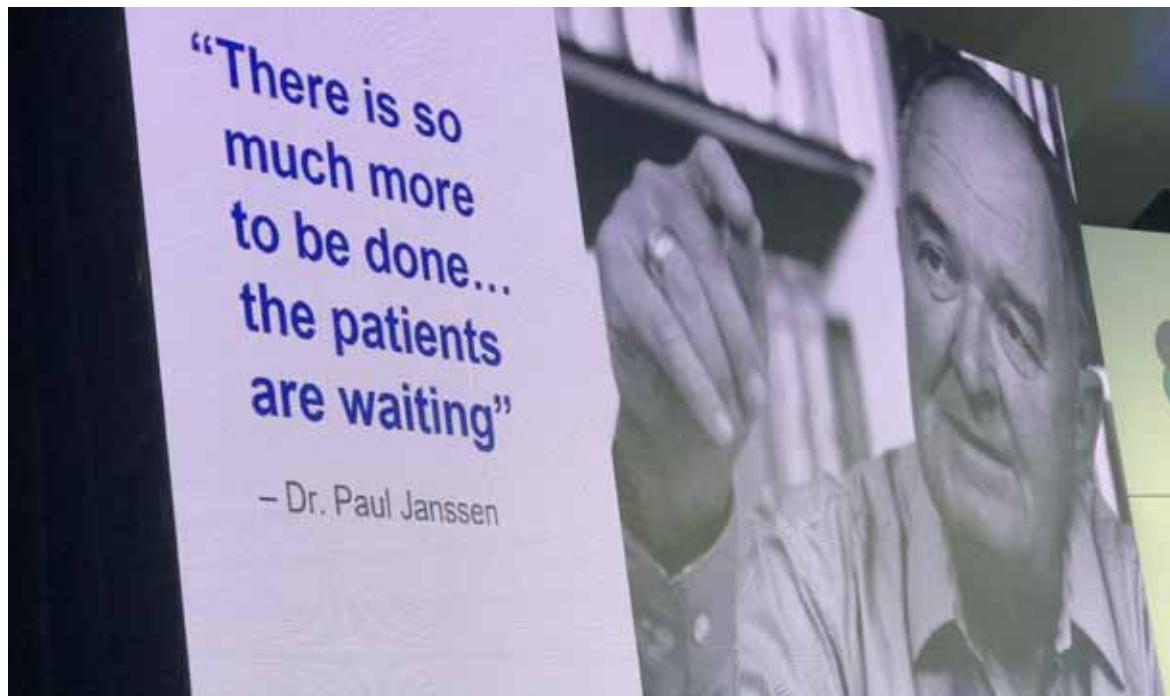
If you look at the data over the last several decades, it demonstrates a significant increase in longevity and life expectancy. For example, the rate of cancer death has been decreasing, and people are living longer with cancer than ever before. Approximately 64% of US patients diagnosed with cancer in 2005 have lived 10 years or more beyond diagnosis, up from 35% for those diagnosed in 1975. This progress is due to significant investment in cancer research and the introduction of new solutions like immunotherapy, cell therapy and precision medicine. Another example is HIV. In the early 1980's, if a patient contracted the HIV virus, he or she had just a few years to live with very poor quality of life. Today, with treatment, HIV positive individuals have a near-normal life expectancy. Yet another example is surgery, where doctors can employ robotics and advanced digital surgery solutions to deliver significantly better outcomes for patients undergoing many types of procedures.

Despite this progress, many complex healthcare challenges remain. Alzheimer's Disease, cancer, diabetes and depression are chronic diseases that pose challenges in all regions of the world and drive tremendous cost in the healthcare system. But with the explosion of new science and technology advances at our fingertips, I have never been more optimistic about our ability to tackle the complex challenges facing the world today.

In the past several decades, due to the investment by government and industry, the scientific community has sequenced the human genome, delivered personalized medicines, learned how to edit DNA, and developed capabilities to print replacement body parts using 3-D printing. We are learning more about the microbiome and the power of harnessing the immune system to tackle cancer. Robotics, machine learning, artificial intelligence and digitalization are providing game changing opportunities. The explosion of data gives us opportunity for unprecedented insights, and the potential to transform healthcare is enormous.

In the coming decade, we could see some of the most exciting and impactful healthcare breakthroughs of all time. However, no one organization can overcome these complex obstacles alone. To solve today's challenges, and reap the promise of today's science and technology innovation, it will require extreme collaboration on an international scale. As a scientific and medical community, we have gotten much better at collaboration between academic institutions, government research institutions, hospitals, biotech start-ups and pharmaceutical companies, leveraging ideas, capabilities and resources to accelerate innovation, solve problems and achieve positive outcomes for society.

In addition to advancing new treatments and solutions, we are working to intercept and prevent disease from ever happening. For most chronic disorders, the disease process often starts decades before it presents symptomatically. This is true with diabetes and metabolic disease, cardiovascular disease, dementia and mental health, as well as cancer. Being able to identify individuals at the earliest stage of their disease can completely change the therapeutic paradigm for these disorders, and also transform the way that healthcare is



delivered. Such early diagnostics form one of the most important contributors towards the goal of moving towards a healthcare system that is more focused on sustaining health, rather than treating late-stage patients with symptomatic disease. For infectious diseases, this means developing new preventive vaccines. One example of significant progress is an HIV vaccine: after decades of research, we finally have a promising candidate in clinical trials. If successful, it will be a major leap forward in making HIV a disease of the past.

Johnson & Johnson is committed to harnessing our talent, resources and expertise, as well as working in collaboration with a broad set of partners around the world to turn the promise of innovation into reality. For more than 130 years, Johnson & Johnson has been harnessing science and technology to enhance and advance the health of people around the world. The company was founded on the insights of antiseptic advocate Joseph Lister in 1885 when the Johnson Brothers created a line of ready-to-use surgical dressings. Today, Johnson & Johnson is one of the largest and most broadly-based healthcare companies in the world, delivering innovative solutions in pharmaceuticals, medical devices and consumer products.

At the same time, we know a great idea can

come from anywhere. We seek the best science, wherever it may be. Innovation today is occurring at a much faster rate than we could have ever imagined even ten years ago, and there are many technological and medical advances taking place outside our company, so it's critical that we are connected with the external environment. We work to fuel the life sciences ecosystem and foster early-stage innovation so that great ideas from anywhere in the world can become breakthrough products for patients. And we also work to ensure that everyone, everywhere has access to these solutions. Through our global public health organization, we collaborate with governments, NGOs and others to ensure our innovations reach people who need them everywhere in the world.

Every day, we are fueled by our vision to make a profound impact on human health through science and innovation. We are committed to identifying and advancing the most promising ideas, and working in collaboration across the globe to deliver value to society measured in years of life and quality of life for people all over the globe.



## REFERENCES

<https://ascopubs.org/doi/10.1200/JCO.2017.77.0446>