Baillie Gifford™

Five years of the Health Innovation Strategy

March 2024

Julia Angeles, Investment Manager, and Diana Philip, Investment Specialist mark the fifth anniversary of the Health Innovation Strategy. They discuss the remarkable progress made within healthcare and share their enthusiasm for what is yet to come.

Your capital is at risk. Past performance is not a guide to future returns.

Diana Philip (DP): Hello, welcome to the Health Innovation five-year anniversary webinar. Thank you so much for joining us. I'm Diana Philip, I am an investment specialist on the Health Innovation Strategy, and I'm joined by Julia Angeles, a partner at Baillie Gifford and one of the three decision makers on the Health Innovation team.

A lot has happened since we launched Health Innovation five years ago. We've had a global pandemic and many of the companies in our portfolio were really instrumental in helping us to get through this. But we're now, of course, in the post-pandemic environment and businesses are faced with a new reality of higher inflation, higher interest rates and capital scarcity.

We would like to spend the next 30 minutes, before opening up to your questions, to discuss the opportunities that we could say within the innovative healthcare space that led us to launch this strategy, but also to unpack the environment of the past five years and how our portfolio has navigated this. But finally, we'd like to share with you our enthusiasm for what is yet to come and why we believe that this represents one of the most compelling investment opportunities of the coming decade.

I'd also like to encourage you to ask your own questions and if anybody dialling in does have a question for Julia or I, you can ask the question by tapping on the ask a question link at the bottom of your screen.

So, Julia, perhaps we can go back to the beginning, and I'd love to hear your insights about what led us to launch the Health Innovation Strategy. It was our first and it's our only thematic strategy at Baillie Gifford, so that in itself must be quite telling about the huge potential that we could see to generate attractive returns for our clients, but I'd love to hear it from you.

Julia Angeles (JA): Thank you, Diana, and it's a great pleasure to be here. Yes, it's always helpful to take a step back and think about how did we get here. And the journey began more than a decade ago. As growth investors, we are always searching in the pool of innovation across many different technologies and industries. And more than a decade ago, we came across a company called Illumina that has been developing a tool to sequence the human genome. At the time, it was still very immature technology, but we started asking questions. What if it works? What if we can bring the cost of sequencing down? What if we could start reading the biology from the first principles? What implications it would have for health? At the time, it was still very immature. We just had some ideas how it what become, but there was something significantly shifting. So that was the beginning of the interest and seeing that actually healthcare could be transformed.

And if you fast forward 10 years, we could see that the initial hypothesis has been validated. So first of all, this technology now is ubiquitous. It's available to most of the healthcare systems. But more importantly, the application of this technologies is already available for patients. So, it's not just in the research stage, it's already used in clinic. It was also fascinating in parallel to companies like Illumina, there was also something else happening. Everyone is aware of the technological revolution, of the computing power getting cheaper, faster, and that something has been happening in parallel. And if you combine that with, for example, technology like Illumina, then you start seeing that not only are we able to generate data, we can also derive insights. So, we call it one of the convergences. But actually, there's so many other different technologies been developing in parallel. What we saw was really an evolution of many different technologies coming together and creating unique opportunities to redefine the future of health.

So that was the beginning. And, as I already said, some of the hypothesis is already validated, but there is still so much to happen. And that was the impetus to start the strategy because we sought to do it and we needed a really a dedicated effort. And that was the beginning of Health Innovation.

DP: And that dedicated effort is a team of three portfolio managers who run the strategy. We don't operate, though, in isolation. We have another 170 investors at Baillie Gifford, and we can draw upon their research and their insights too. But I understand that we've also made significant strides forward in terms of our external sources of insight. And maybe you can touch a little bit more on that.

JA: Yes, very early, I would say, again, more than a decade ago, we also realised we cannot do it alone. So obviously we have our investors who can all kind of research the healthcare space and increasingly this has become one of most research areas at Baillie Gifford. But we also realised, we cannot hire all the intelligence and all the sciences in Baillie Gifford to help us actually to be the best investors in the space. So, what we did, we started building relationships with the outside world. And those are very different types of relationships. It ranges from thought leaders in different scientific areas, entrepreneurs, early investors in the space, and academics. It's really a wide spectrum of people who are really developing science and it's really part of their lives. So, we started tapping in their intelligence and that allow us to help to build understanding of what healthcare could become. To start building a new hypothesis, as I say, we started with one hypothesis, but we needed to develop and build better a understanding where the big trends are.

So over the past 10 years, this type of relationships became incredible source of inspiration and ideas to us. And whenever we come with a different scientific project or complex matter, we can always tap into this broad intelligence outside Baillie Gifford. Thank you.

DP: I think it's important to touch on Covid. When we launched Health Innovation in 2018, we never first saw a global pandemic. I mentioned that a number of the portfolio companies really played an important role in getting us through this. I think we can say that a third of the portfolio could be linked to helping the world get through the pandemic. Maybe you can bring to life some of the examples of the companies that played a really instrumental role here.

JA: So when we started the strategy, no one anticipated Covid. And it was actually very reassuring to see that one sort of the portfolio has been part of the problem solvers, and actually helping us to get out of the pandemic. And, it's very hard to talk about pandemic and not talking about Moderna because, without messenger RNA vaccine, we don't know where would we have been now.

DP: So Moderna is a company that we've held since the IPO and since the launch of the strategy, so well before Covid.

JA: Yes, precisely. We invested in Moderna in 2018. It was not trying to anticipate any pandemics. But the hypothesis we had around messenger RNA, that it is the most effective tool to develop vaccines. And Covid has just been one of the opportunities to validate that hypothesis. So Covid became one of those validation point of the importance, first of all, of technological progress in health and bringing some of those technologies at the forefront as problem solvers, but also giving us insight how those technologies can be used, in addressing other challenges similar to Covid. There are many other infectious diseases that are still untreatable. And for example, Moderna is just working on RSV, it's another respiratory vaccine that hasn't been developed for a decade. Now we have Moderna, and we have a few others. But it's something that has always been a strong hypothesis around new tools helping to solve unmet needs.

And Covid has been a validation point. And there are many other companies within portfolio, for example, Ambu, that provides single use endoscopes. So, this technology has been used for the intubation of patients, so when patients can't breathe, they needed to put kind of on their respiratory support. And those tools have been used to help them to hook them on the machine. So, this is another one. I can go on, the list is long, but it was just encouraging to see how all these companies became problem solvers during a massive crisis.

DP: Problem solvers and were able to pivot very rapidly and really make a significant contribution to get us out of the pandemic. But of course, now we are, through the pandemic, we are in a very different environment. And I touched on the different macro environment that we are living through now. How has this post-Covid environment affected the types of companies that we invest in within the Health Innovation portfolio?

JA: In a way, Covid has introduced some noise to the system, both positive and negative. Positive in the sense it accelerated certain technology and validated those, but negative because it was not a normal environment we were operating at. First of all, the demand for Covid-related product has increased substantially, but also many companies in the ecosystem have been acting in a very uncertain world. They would have been accelerating demand for the basic products, not directly related to the Covid. So, what we've seen, acceleration of the demand during Covid, so that's of the frictions that have been brought to the system.

And of course, when Covid ended, demand has reversed, and we didn't also have much visibility in terms of how much stockpiling took place. So that's very specific for healthcare companies, the implications of Covid. But another one, obviously, is also macro conditions that followed post-pandemic, more difficult macro environment with high interest rates, which also has implications for healthcare companies, especially those who depend on the capital markets. So, in a way, I would say healthcare companies, they have benefited during Covid, but also they suffered most in the post-Covid transition, both because to the Covid-related demand shocks, but also to the macro environment.

DP: So almost a perfect storm since we have come out of the pandemic, but where does that leave us now? We're not macro investors at Baillie Gifford, but there seem to be some strong signs that interest rates have at least plateaued, if not may come down this year. Where does that leave us? Where does this leave innovative healthcare? And what is your outlook from here?

JA: So, for the first two years in this adjustment period, it's been a very tough period for many companies. As we discussed, capital constraint has been really very painful for many companies, especially early-stage biotech businesses that require a lot of capital and time before they actually can get to the sustainable financial profile. But what is really encouraging for us to see is that the system adjusts. We went through and we're going through an adjustment period, and now we know what environment we're operating at. And actually, companies are adjusting to the environment. And what's also encouraging is that they're making sound decisions which are going to help them to become even better businesses in the long term. For example, there is a lot of real prioritization in terms of pipelines, focus on the products, on the programs in the pipeline that have a high chance to become products, rather than maybe spreading too thinly and thinking, okay, something's going to make it.

So, there is a lot more consideration and sound decisions that go into the process because now companies operate in a constrained environment. And normally crisis forces companies to be much more creative in the way they use resources and the decisions they're making. In a way, I think that this crisis also has some silver linings. There are also some positive sides which actually help businesses to get in a better shape. And if they continue to operate in a more favourable environment in the same shape, actually, I think it's going to be beneficial for returns in the end for companies and also for the investment returns.

DP: And really should play to our strengths with a very concentrated portfolio where we have very bottom-up robust process when it comes to stock selection. Maybe I can take you on to the shape of the portfolio today. We talk about investing across the entire spectrum of health. What does that mean? And where are you particularly excited about in the portfolio today?

JA: So, when we set up the strategy, immediately we decided that we want to invest in any company that drive transformational change in health. So, any company that can introduce technology, a tool, whether it's a drug or device or software, it's something that's a radical change in the way we think about human health. And that applies across the spectrum. So, we invest in companies that are enablers. The ones that enable us to understand and study biology. Illumina was one of the examples that allows us to sequence human genome. But there are many other companies that develop tools that allow us to go deeper in studying biology. This is kind of one. Towards, the other side of the spectrum is any company that tries actually to cut some fat out of the system. Healthcare systems and even pharma companies, they still operate quite in an inefficient way. Any tool that can help to make those companies or businesses more efficient, those are also very interesting to us because that releases energy and save costs for the systems. And we know healthcare is very, very expensive. So, this is kind of on another spectrum.

And in the middle, we have anything from diagnostic, because obviously diagnostic is a crucial technology and leads to better outcomes for patients. If we are able to diagnose patients early, we're halfway through to actually getting to the cure, and cancer is a great example there. And to the companies that directly provide technologies to treat diseases. And we're looking only at the biotech businesses, which getting us closer to cures and treat underlying causes of diseases which have very limited side effects.

And we are looking across, again, many different conditions. Oncology is one example, but also autoimmune diseases, and diseases of brain like Alzheimer's, so, it's a really, really wide spectrum. And eventually there is this category called prevention, which is, I think, the most powerful one. And my take is that the future actually should be in prevention, but how you approach prevention, there are many different ways. I would say Moderna, again, is one of the plays on prevention because there is no better way to prevent diseases as through vaccines. So this is the shape of the portfolio. And we roughly have around 35 names in the portfolio across all those themes.

DP: While you're on the topic of prevention, it makes me think of one of the big themes of the last year, and that was the GLP-1 drugs or the anti-obesity drugs. What is the exposure to those in the portfolio? And what is their effect been on the portfolio in general?

JA: So, at the moment, we don't have a direct exposure to GLP-1s. I would say there is an indirect exposure through a company like Dexcom. So Dexcom develops glucose monitors. It's something you can wear on your arm, and it monitors the levels of glucose. And this technology is used by type 1 and type 2 diabetic patients that allows them to monitor where their sugars are and also administer insulin as they require. And what was interesting, first when GLP-1s came out, there was a lot of panic on the market related to companies like Dexcom because everyone thought that we're going to solve obesity and then we would solve diabetes. And then there's going to be no need for those devices. But actually, there is evidence that the use of those devices increases compliance with GLP-1s because there are also behavioural things when patients actually see what's happening in their blood. There is a feedback loop between behaviours, monitoring, and actually taking the drug. So, this is indirect exposure.

And I would say, at the moment, we're actually exploring more, because the companies like Novo Nordisk, Eli Lilly, are front runners in the space. But this is still a very new area. And the first generation of GLP-1s, they've been there already for decades. The companies managed to iterate. But there is still so much to do in order to increase compliance. And truly, in order to achieve the effect on the population level, we also need to introduce behaviour change. There are still lots of exciting things going to be happening in the space and we are looking across the spectrum in the area.

DP: But they did cause quite a severe reaction in the market. We saw anything from the likes of Krispy Kreme or Coca-Cola seeing severe sell-offs last year as a result of the success of the GLP-1s. That actually led us, I believe, to add to or buy a new position in the portfolio. Perhaps you can talk about that.

JA: Yeah, precisely. So first, we've seen that very negative reaction to some of the holdings. Another holding in the portfolio that suffered was ResMed, which is a company that provides technology for patients who suffer from sleep apnea, which is a disease when patients actually stop breathing during sleep. And they do it many, many times during their sleep and that impacts their health more broadly. And again, this disease is connected to obesity. And so there was a direct correlation. And immediately, obviously, those stocks have been impacted. But since, over the past half a year, we've seen a recovery in those holdings. But then there was also weakness in other names like Inspire Medical, which is another sleep apnea company that provides slightly different technology to ResMed. It's a bit more invasive and not as cumbersome as ResMed. So, we took advantage when we analysed the impact of GLP-1s on sleep apnea, and we thought actually the market has overreacted. So, we took a position in another sleep apnea company.

DP: Thank you. And maybe we can go back to the portfolio as a whole. The environment has been challenging for innovative health care companies as a whole. How have the companies in the portfolio fared in this environment? What's happening at a fundamental level within the companies at a portfolio level?

JA: So overall, portfolio is really in a very strong position. If you look just at the top-down financial characteristics of portfolio, 60 per cent of the portfolio is generating cash or positive earnings. And then also 60 per cent of the portfolio is also net cash. So, if you look at the top financial characteristics, it's in a very resilient state. But of course, there would be some difference across holdings. Because we have exposure to early-stage biotech companies, which would have been much more vulnerable in the current situation. What we have done, we really went deep on every single company and analysed its financial resilience.

It required not just to look at the cash on the balance sheet, but also looking at what are the future milestones, how that would help the company to generate cash in the future, and what contingency plan management teams have in place to make sure that they're not going to run out of cash. So, I would say overall, the portfolio, we think, is in a very strong place, but also where attention had to be dedicated, we really spent a lot of time with more vulnerable companies. Overall, we are quite happy where they are. And it's also encouraging to see that capital is coming back to biotech, there is a change of mood. So, we think actually we are over the kind of the worst. And now the general environment is kind of on the recovery trajectory.

DP: Maybe you can just go into that in to a little bit more detail in terms of that change in mood, because I think that's something that our clients want to hear a little bit more about.

JA: For sure. Actually, we were looking at last year and that was a year, you could call it year of stagnation rather than a year of a crisis, I would say. That transition, we were discussing post-Covid and also impacted by the macro conditions. Actually, if you thought about it, you could think that it could have much more dramatic effect on the sector. But if you look at the top-down figures like total R&D spend in the industry, it hasn't really collapsed. And then toward the end of the year, we've seen recovery, in the budgets, both in the pharma, biotech, because we saw more increasing demand for all the health-related products, which in Q3, for example, was still uncertain, but we saw some recovery towards the last year. And also, obviously the pickup in the M&A activity and also funding for the earliest stage biotech. And I would say this dynamic continues in the new year. This is happening irrespectively of what happens to interest rates. So, as I say, the industry already made an adjustment and now it's all about, you know, your fundamentals, your operating progress, and you just focus on this, so we are truly, I would say, on the recovery path.

DP: Maybe before we open up to questions, Julia, I'd like to hear from you about what you've learned in the last five years since we launched Health Innovation.

JA: Yeah, so I guess the key learning that innovation doesn't come in a straight line, there always going to be ups and downs. And it's how do you go through that? And I think it's a reiteration of the process, that strong management teams, those agile teams that can adapt to new environment are extremely important. So, we always had culture and management as a fundamental building block of our investment thesis, but I would say it's getting even more powerful after you go through the crisis. This is a reminder and more iteration on the investment process, and how important it is. But I would say, learning for us is a continuous process. So, if we sit here in another five years, let's say hopefully, we're going to be on the 10 year anniversary, and I would say we're still learning because

I don't think you would ever get there because, what we're doing is difficult and we can only do the best job for our clients if we continue getting better. And so more concretely, we have improved on our process of analysing biotech businesses, medtech, and it's all based on both our successes and some of the bad experiences. So, we really try to bring all that knowledge together and see, how can we iterate in the process? So, it's a continuous iteration and improvement on the process. But the key thing I would say is, as I say, it's really the importance of people managing the businesses.

DP: Thank you. I am just opening up the questions here and I see that a number are coming through already. Perhaps to begin with, we can talk about an example of where we've engaged with a company to help them adapt to this current environment.

JA: We have a few examples in the portfolio. As we discussed, the biotech businesses, they were in the most vulnerable position in the current environment because of access to capital. And we have a few of those companies that they're in a small position, so they're not large holding sizes, but still, they're very, very important to us because if they work, there would be very exciting investment opportunities.

But I would give an example of Vir Biotechnology is a company that focuses on the infectious diseases, and they actually brought a drug during Covid that made them billions of dollars. So, they actually managed to get a lot of cash through that development. But what is interesting, they have a portfolio of other infectious diseases and one of them is hepatitis D. I could never pronounce hepatitis, but anyway. And they came to us and asked, could we actually help them to connect with right institutions to understand first how they can improve on diagnostics of that disease and also understand what could be an access model in that disease. And that's going be a very important product for them. And we know this is a disease that's truly undiagnosed and also, it's prevalent in developing countries. So, we are in the process of connecting them with the right stakeholders that can help them with both sides. And it's just one of the examples where the company understands how we can support them in the process, they are reaching out and we can actually provide them with right connections.

DP: Another question that's come through is about the first gene editing drug that was approved in the UK and the US this year. And the question is, is this an area that we've researched? Are we excited about it? How are we exploring this?

JA: Absolutely, so it's a CRISPR based drug and we absolutely researched it and we excited about it. It's just, we see it as a first wave of innovation within gene editing technologies. And there are many, many different companies in the space. The historic challenge for us was to identify actually who are the leaders in the space and how to differentiate between those companies. And the challenge, and it's a good challenge to have, is that this technology keeps evolving very rapidly. So, this is just the first generation, and we already have several other ways of approaching gene editing. So, we took time to really, to analyse the landscape and thinking about what would be the best way to get exposure to it. And I think it's a great indication of the level of innovation that we are seeing in this space and what got us so excited about investing in innovative healthcare companies in the first place.

DP: Another question that has come through is what new development or theme is exciting us the most?

JA: I can talk about many different themes but maybe I'll pick on three which are already in the portfolio and something, I think maybe something would be interesting for the audience to think about. So, one is really personalised medicine. And the great example at the portfolio level would be a company like Moderna. We've been talking about Moderna in the context of infectious diseases as a play on prevention, but it's also the company that can become a very important player in cancer. Moderna is in a very advanced stage of developing a personalised cancer vaccine. And we're talking about personalised, it's truly personalised. It's based on the patient's tumour data. So, when we can take the tumour, we can analyse its profile and on the back of its profile, we can design a vaccine that works against that tumour. This is truly remarkable as a convergence, that really creative convergence that brought us a completely different approach of treating cancer. But what is really exciting is cancer, in a way, gives us a bit of a window into how we can start approaching other diseases. We can potentially start seeing Alzheimer's also as multitude of diseases and we can also start diagnosing Alzheimer's possibly as early in the process before it becomes symptomatic. So, whatever we see in cancer, you can only start getting even more excited because many of the things are transferable. They do take time to develop, but there are some analogies there.

Another area which I'm very excited about is connected to prevention and it's connected also to the immune system. When we talk about prevention, again, healthcare systems don't operate in that way. We mostly end up at the hospital quite sick already, but there is also so much people can do. And one of the exciting developments, from a company Dexcom, which I mentioned before, that produces glucose monitors, they just actually got an FDA approved monitor that can be sold over the encounter. And I would recommend everyone to get one. And the reason for that is we know that those devices are used by patients who are suffering from diabetes, but healthy people can also benefit from that.

If you start monitor what glucose does, through the day, through your cycle, when you eat, when you exercise, you would notice you have some unhealthy development like glucose spikes that impact your energy levels, but also they lead to inflammation. And inflammation is really not good for you, especially in the long term. So actually, there is lots can be done on everyday basis by healthy humans to start building for health for the future. So, this is one of the areas, when you start taking care of yourself as a healthy person, and devices have now started traveling from sick patients to the healthy populations. So, this, for example, I think is also very, very exciting.

DP: We've got a question here about artificial intelligence and how that is impacting the portfolio and what exposure we have to AI within Health Innovation.

JA: So obviously AI hasn't escaped anyone over the past five years, and it has been really developing very rapidly as a tool itself, what type of technology we have in our hands now. And we've been very early in that space, and we start supporting companies at preclinical stage to start using AI as a tool to develop drugs and using it for discovering targets. One of the example at the portfolio level would be a company Exscientia. It's a UK-based company that use AI to design small molecular drugs. And the way they do it is to optimize both for efficacy and safety. So, they're not just taking off the shelf a drug and then try to optimize it, but they're building it atom by atom by using AI. And they're also using machine learning to identify the right groups of patients and who that drug is likely to work on. So, we have very actually wide exposure to AI at the drug development level, but I would say it's still early in the process in terms of validation of those drugs getting through approval and to the patients, we are still early in the process.

DP: Shifting it back to the portfolio, we've got a question here on valuation and how the recent environment has affected valuations of the portfolio.

JA: So, if you look at the portfolio level, you would say that it's very cheap. What does it mean being cheap? If you look at the price to sales and price to earnings levels, then it's actually, it's lower than we started the strategy. And if you put it in the context of the operational progress that company have made over the past five years, it feels there is a big disconnect between the valuations and, the progress and validation we have for many, many technologies that were much uncertain five years ago. In a way, we can talk about innovation is on sale. We believe that, as companies continue proving that they have something very valuable in their hands that are going to generate cash, the market is going to reward it. And so, the entire focus is really keeping those companies that making a strong operational progress.

DP: And another question that has come through is what is keeping you up at night in terms of worries at the portfolio level?

JA: I sleep very well in general. So, I guess the worry would be not so much at the portfolio level is more behavioural because the current environment could tilt you towards risk aversion because it's been very volatile, the performance has been weak and it's natural for humans to behave in more defensive ways because it is very uncomfortable to be where we are and sticking to your knitting. So, if anything that would keep me at night and I worry about it, are we really doing what we promised our clients to do five years ago? Are we really sticking to our investment philosophy and process and looking for those transformational companies.

DP: That probably leads nicely on to the next question is what would you say your edge is and how do you stand out from your competitors?

JA: So, I mean, most of our clients will be familiar with Baillie Gifford, we are long-term growth investors, and this sector truly benefits from this approach because it does take time to validate the technology and bring it to the market. And very often companies will require long-term patient capital. And we are there to support the companies and we have also already had some examples where we played a crucial role in really changing the strategy of the company, providing them the necessary capital to really keep investing in their pipeline and bringing drugs to the market. So, I would say this is something, that's an edge in itself because we can skew risk reward in our favour by helping companies to become better businesses. And I think another one is truly to be very open to the ecosystem, not trying to build all our intelligence inside the house, but actually being open-minded, being adaptable and just listening to what's happening out there and trying to incorporate it into your investment process.

DP: I am conscious of time, and we've got another couple of questions that have come through. One is on the inflationary environment. And considering the high levels of inflation that we've seen, are there any examples of companies in the portfolio that are using technology to take costs out of the system?

JA: Yes, for sure. There are many, many. I would say most of our companies should be taking cost of the system. First, if you're addressing the underlying source of disease and looking for the cure, that should take cost of the system. Early diagnostic tools, if you can capture the disease early, then they're like an oncologist and you don't need the whole array of treatments. Again, that costs a lot to the healthcare systems. And prevention is always better than cure. If you can start intervening and prevent diseases, that's again, that's taking cost of the healthcare systems. So, I would say the entire portfolio is really targeted towards make the healthcare system more efficient, but ultimately making the population healthier.

DP: Probably time for one or two more questions. On Illumina, we've talked about that at the beginning of the session, and we've owned this since the inception of the strategy. It has had some challenges recently. How do we feel about Illumina today?

JA: Illumina has been a rollercoaster over the past three years. Most of the audience would be familiar that they made a mistake with the grail acquisition. They closed a deal ahead of regulatory approval, which was not a very wise decision. And there was also lack of focus on the core business. There was a lot of destruction, which led eventually to them change of the management team. So yeah, so there've been a few important developments on the company level. However, we've been just discussing Illumina in the team. And what's really fascinating is actually Illumina has done what we expected Illumina to do in terms of delivering cheaper, more accurate and faster technology. And they got to where we wanted them to get 10 years ago.

It has just been a lot of things happening on the side. And if anything, that technology has become an even stronger enabler of study biology. So, we are going from reading DNA to actually study proteins, which also involve Illumina technology. So suddenly I would say, over the past 10 years, we were just building infrastructure for studying biology and translating that knowledge into the clinic. And if anything, I think the demand for Illumina is still there for their tools. So, we are still remaining very optimistic on behalf, but obviously taking into account all the negative developments and trying to work around those.

DP: The last question that I think we've got time for is they've asked for us to provide an example of one of the industry network relationships that you mentioned earlier and how that has helped us in our investment research.

JA: Yeah, so one of the examples that springs to my mind is IMEC. It's not a healthcare dedicated institute, it's actually connected to the semiconductor industry and IMEC played a crucial role in driving technological revolution, making our devices more efficient and more powerful. And, but what is interesting while they enabler of the semiconductor, they're using the semiconductor technology in different other industries, whether it's environment and health. They're most excited about health because they think nothing, because it's human, human, very human. And they want to spend more time applying that kind of digital technology to health. And one of the projects we've been sponsoring at IMEC is connected to brain on the chip. Again, it's how you bring the biology and technology kind of in one space and they're building brain in 3D on a chip that is going to allow us to study the brain, but also study drugs on the brain. So suddenly, we don't need to, struggle in the past to study brain disease because we just can't get access easily to human brain. And suddenly we can now do it ex vivo. So, this is truly exciting, and this is one of the examples.

DP: And probably a great place to leave this as it really indicates the level of innovation that is going on, but also highlights the alternative sources of information that are so important to us within Health Innovation. So, thank you all very much for dialling in. We really hope that this has provided an insight into why we believe the future of healthcare looks even more exciting to us today than it did when we first launched this strategy back in 2018. Thanks to this huge technological progress that we're seeing that's converging with the healthcare sector, we really now are entering a new era of healthcare. One that, as Julia said, is of predictive and personalised medicine where doctors can now treat the cause and not just the symptoms of disease.

What have long therefore been probably the topics of science fiction are finally becoming a reality. We really think that this is the start of a huge transformation in healthcare, and it is opening up hugely exciting investment opportunities for our clients that will ultimately enable us all to live longer and healthier lives too. So, thank you so much for listening.

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Health Innovation

Annual past performance to 31 December each year (net%)

	2019	2020	2021	2022	2023
*Health Innovation Composite	28.0	81.4	-7.8	-32.7	-12.6
MSCI ACWI Index	27.3	16.8	19.0	-18.0	22.8
MSCI ACWI Healthcare Index	23.3	15.4	18.0	-5.7	4.1

Annualised returns to 31 December 2023 (net%)

	1 year	5 years	Since inception*
*Health Innovation Composite	-12.6	4.7	3.9
MSCI ACWI Index	22.8	12.3	10.6
MSCI ACWI Healthcare Index	4.1	10.5	9.5

*Inception date: 31 October 2018
Source: Baillie Gifford & Co and MSCI. USD. Returns have been calculated by reducing the gross return by the highest annual management fee for the composite.

Past performance is not a guide to future returns.

Risk factors

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