

2024 Novo Nordisk Foundation
**Global
Science
Summit**

Summit Report



Global Science Summit 2024

Over two days in May, more than 150 participants assembled in Helsingør, Denmark, for the Global Science Summit 2024. Organised by the Novo Nordisk Foundation to mark its centenary year, the Summit brought together **leading scientists, philanthropists, policymakers and opinion leaders from around the world** to exchange ideas, share insights and advance knowledge on key global challenges. Its goal was **to explore the interaction between the world's biggest health and sustainability challenges and pave the way for new scientific breakthroughs**.

The Summit comprised sessions addressing climate change and its interaction with infectious diseases (IDs) and non-communicable diseases (NCDs), as well as sessions dedicated to exploring how to enable and promote scientific breakthroughs and ensure a translational value chain is in place to bring benefit to populations across the globe, including those in low- and middle-income countries (LMICs).

In a time of polycrisis, coordinated action and partnerships, to drive translation of basic science through to societal impact, are critical success factors. Moreover, as the challenges are worldwide, solutions cannot be limited to the Global North. Hence, the Global Science Summit brought together stakeholders from across the entire value chain and ensured robust representation from organisations in the Global South.

Input was invited from all delegates through interactive tools and discussions with the audience. Feedback from delegates indicated that the networking opportunities offered by the Summit were invaluable, with many new contacts and potential partnerships formed at the meeting.

A list of the organisations represented at the Summit can be found in Appendix 1.



Polycrisis

The World Economic Forum's [Global Risks Report 2023](#) uses the term to explain how, “present and future risks can also interact with each other to form a ‘polycrisis’ – a cluster of related global risks with compounding effects, such that the overall impact exceeds the sum of each part”.



This summary report reflects highlights from the Global Science Summit 2024. It is designed to give an overview of the topics discussed and is not intended to act as comprehensive minutes of the meeting. The speakers and panellists involved have not approved this document.

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Executive summary

The Global Science Summit 2024 was organised to coincide with the Novo Nordisk Foundation's centennial. It also coincided with a special announcement made immediately prior to the start of the Summit: a collaborative agreement between the Novo Nordisk Foundation, the Wellcome Trust and the Bill & Melinda Gates Foundation (see Appendix 2).

The aim of the Summit was to bring together leading scientists, philanthropists, policymakers and opinion leaders from around the world to explore potential solutions on the key global challenges presented by the 'polycrisis' through which humanity is now living.

During the programme (see Appendix 4), speakers first explored the effects of climate change on infectious diseases (IDs) and non-communicable diseases (NCDs). They then discussed ways in which cities could be transformed to better manage climate change and health challenges through the lens of rapidly growing cities that are currently under threat from climate change. The agenda then turned to the two enablers of potential solutions: scientific advances and the technical tools to drive solution development, and the financial and political tools to ensure a translational value chain exists, even for solutions without a commercial pull. Robust representation from the Global South ensured discussions considered the shared commitments to make sure any potential solutions are applicable to, and benefit, low- and middle-income countries (LMICs).

Opening session

Mr Lars Rebien Sørensen (Chair of the Novo Nordisk Foundation Board) used the Foundation's centennial to explore global challenges and parallels between 1924 and 2024, reinforcing the conclusion that human health and planetary health are inextricably intertwined. Mr Bill Gates (Co-Chair of the Bill & Melinda Gates Foundation) celebrated the successes in halving child deaths globally since 1990 and looked to the next decade as a 'global age of nutrition' with innumerable benefits. Dr Tedros Adhanom Ghebreyesus (Director General, World Health Organization; WHO) reviewed the challenges presented by the climate crisis and the inequality that exists in health across the world. While the principle of 'no one is safe until everyone is safe' is sound,

attacks and disinformation risk undermining the WHO's mission. Dr Catherine Kyobutungi (Executive Director, African Population and Health Research Center; APHRC) highlighted that whatever the problem, it is always worse in Africa, including the 'double impact' of rising NCDs against a backdrop of IDs. She reinforced the need to ensure translation but also to ensure such translation can impact lives in Africa. Finally, Prof. Mads Krosgaard Thomsen (CEO, Novo Nordisk Foundation) looked at three of the *Ten Societal Megatrends Affecting The Outlook For Human and Planetary Health* concerning urbanisation, climate change and food security, highlighting that one cannot solve complex diseases with simple solutions. The panel discussion that followed involved a review of political challenges, ensuring LMICs become part of everyday thinking, and the need to address the full value chain to ensure successful translation: the scientists, the innovators, the policymakers, the politicians and the public. As Dr Kyobutungi reminded everyone: if you want to go fast, go alone; if you want to go far, go together.

Connecting health and sustainability in the time of polycrisis

Dr John-Arne Røttingen (CEO, Wellcome Trust) described Wellcome's mission and outlined the challenges ahead, in particular the challenge of making health a core part of discussions on climate change to ensure appropriate action. He reinforced the need to ensure that, while solutions are being developed, work should be ongoing to prepare the policy and practice space for scale-up. During the panel session, Dr Alaa Murabit (Director, Program Advocacy and Communications, Health, Bill & Melinda Gates Foundation) highlighted that crisis is not a particular moment or action, but a sustained lack of leadership, commitment and/or accountability. In any crisis, people do not care what the crisis is, they care about the impact on their lives and livelihoods. Prof. Flemming Konradsen (Senior Vice President, Social & Humanitarian, Novo Nordisk Foundation) reinforced the need to ensure that targeting NCDs is firmly integrated into primary care rather than secondary to ID in countries in the 'double burden zone'. As described by Prof. Krishnaswamy VijayRaghavan (former Principal Scientific Adviser to the Government of India), if a population is exposed



to the double burden of ID and lifestyles that lead to NCDs, leading to burden at a younger age, it will cripple the country's economy. Dr Lynda Stuart (Executive Director, Institute for Protein Design) described the tremendous number of scientific breakthroughs and innovations, and how those that are commercially viable succeed; she stressed that the problem is a failure of translation where commercial pull is lacking. The panel agreed that a clear understanding of the lived experiences of those facing a particular problem is needed to develop an optimal solution and that the polycrisis should always be in the background when thinking about innovation: one cannot address one incipient crisis only for another to flare up. The discussion also touched upon the importance of using the right messengers and working with the right groups and communities to build trust.

Climate change and non-communicable diseases

Prof. Walter C. Willett (Department of Epidemiology and Nutrition at Harvard T.H. Chan School of Public Health) underscored the urgent need for strategic shifts in agricultural practices and dietary habits to address climate change and promote global health. He then reviewed key initiatives and the need for multifaceted actions across sectors that include a combination of top-down leadership and bottom-up initiatives. The panel discussion, involving Dr Bente Mikkelsen (Director for Noncommunicable Diseases, Rehabilitation and Disability, WHO), Dr Rachel Nugent (Senior Technical Advisor at the Center for Global Noncommunicable Diseases, RTI International) and Dr Poornima Prabhakaran (Director of the Centre for Health Analytics Research and Trends, Trivedi School of Biosciences and Ashoka University and Centre for Chronic Disease Control), reviewed topics such as integrating health considerations into broader governance frameworks and ensuring that health systems are equipped to handle both chronic diseases and the impacts of climate change. The

panel also discussed the need for practical narratives to illustrate the tangible benefits of interventions to policymakers and build political will to drive system changes and achieve meaningful progress in public health outcomes.

Climate change, infectious diseases and the food system

Prof. Katherine Richardson (University of Copenhagen) began the keynote lecture by illustrating the critical interconnectedness of the Earth's geosphere, biosphere and the emerging anthroposphere. Prof. Richardson explored the concept of planetary boundaries, highlighting that humanity has transgressed six of the nine planetary boundaries, before reinforcing the need for holistic and system approaches to sustainability and survival. Sir John Bell, President of the Ellison Institute of Technology (EIT) and Co-CEO of EIT Global, acknowledged the profound impacts of climate change on IDs and emphasised the need for integrated, system-wide solutions. He stressed that "you cannot wait until you get to the finish line before you consider policy". The two keynote speakers were joined on stage by Dr Maria Neira (Director, Environment, Climate Change and Health, WHO), Prof. Jeremy Hess (University of Washington), Prof. Jan C. Semenza (Project Manager, Section of Sustainable Health at Umeå University) and Ms Fahreen Chudasama (Director of Development Cooperation at AGRA) for the subsequent panel discussion on solutions and scaling. The discussion touched upon the need to integrate health arguments into climate change discussions, the necessity of shaping the policy environment from the beginning of the innovation process, the importance of data synthesis to inform action and prevent crises, and the importance of ensuring community engagement. Underlying all these elements is a need to depoliticise climate change and frame it as a public health issue.

Cities at the intersection of climate change, NCDs, IDs and food systems

This session planned to use Nairobi as an example to explore the interconnected challenges; however, keynote speaker H.E. Sakaja Arthur Johnson (Governor of Nairobi City County) was unable to attend as his city was grappling with the results of severe flooding – a striking example of the scale of the problems faced by many regions of the world and a call to action for those who managed to travel to Helsingør. Panellists Dr Corinna Hawkes (Director, Agrifood Systems and Food Safety, Food and Agricultural Organization), Dr Raji Tajudeen (Ag. Deputy Director General of the Africa CDC), Clinical Prof. Tolullah Oni (University of Cambridge and CEO of UrbanBetter) and Mr Augustin Flory (Managing Director, Innovative Partnerships and Development Finance at Gavi, the Vaccine Alliance) brought diverse perspectives from their fields, discussing the interconnectedness of health, climate resilience, urban planning and food systems. As cities function as complex adaptive systems in which interventions in one sector will affect another, it was highlighted that health and climate resilience need to be central to urban development. Key barriers to this are the normalisation of unhealthy urban environments and the disconnect between environmental exposure and health outcome. Thus, there is a necessity for integrated, cross-sectoral approaches to address the multifaceted challenges posed by climate change and urbanisation.

Enablers of translation: technology and scientific breakthroughs

Dr Stuart delivered a keynote lecture detailing the current state of the art after a 50-year challenge to understand how proteins fold. The technology now exists (using AI) to not only predict how a protein from a particular gene sequence will fold, but also to design our own proteins. This can be coupled with mRNA vaccine technology but can also extend beyond medicine, creating enzymes or plant proteins. For the discussion, Dr Stuart was joined on stage by Prof. Peter Krogstrup Jeppesen (CEO, Novo Nordisk Foundation Quantum Computing Programme and Quantum Foundry and Quantum Foundry), Dr Corinna Cortes (Vice President, Google Research) and Dr Ismahane Elouafi (Executive Managing Director, CGIAR). The discussion reviewed the potential for AI, including how AI will enable the construction of quantum computers to further accelerate the AI

revolution, but was kept grounded in the need to tap into knowledge of those with the lived experience of a problem and ensure solutions are applicable to different populations. The group also touched upon a ‘trust crisis’ and the need to ensure clear communication of the benefits of novel technologies to consumers.

Enablers of translation: finance models

Dr Cheryl Martin (Founder, Harwich Partners & former ARPA-E Director) and Mr Jeppe Christiansen (CEO, Maj Invest) began the discussion with a look at energy transition as a mitigation factor for climate change, reviewing the ‘pull’ and ‘push’ factors that have so far limited a green transition. This led to a discussion of the incentives needed to create demand. Dr Martin and Mr Christiansen were then joined by Mr Mads Nipper (CEO, Ørsted), Ms Gina Domanig (Managing Partner, Emerald Technology Ventures), Dr Johannes Fruehauf (Executive Director, Biolabs/LabCentral) and Dr Lars Frølund (Massachusetts Institute of Technology). The subsequent discussion touched upon the need to de-risk innovation and address the implementation gap from the laboratory to real-life use.

The conversation highlighted the inherent condition that venture capital is expected to deliver return for investors, which encouraged a discussion on the ethics of putting financial returns above global health. To this end, the important role of philanthropic funds was mentioned, acknowledging that such funds are just a drop in the ocean. Mr Christiansen repeated the crucial need for a ‘pull’ from regulation to drive capital flow.

Concluding remarks

Reflecting upon his own learnings from the Summit, Prof. Thomsen drew attention to the need to drive scientific breakthroughs to translation and implementation in an equitable manner. He underlined that, while response to IDs can be smart and (now) quick, chronic NCDs are multifactorial and intervention will require partnerships. He also highlighted that, throughout the Summit, it was repeated that people do not understand the benefits of action. If we can explain the benefits clearly, we are more likely to get support and adoption. The challenge, as raised by Sir Jeremy Farrar (Chief Scientist, WHO), is that science/innovation and politics are diverging, with public trust in international organisations falling. Inclusive development and bringing the divergence back together is vital.

Full report

Opening session

Mr Lars Rebien Sørensen, Chair of the Board, Novo Nordisk Foundation, welcomed participants to the Global Science Summit 2024 and used the Foundation's centennial to explore global changes and parallels between 1924 and 2024. Scientific breakthroughs over the past century mean that much of what disabled and killed 100 years ago is no longer a threat. However, while the global challenges of 1924 and 2024 are different, the current challenges are just as distressing: climate change, geopolitical instability, health inequality. What is clear is that **human health and planetary health are inextricably intertwined**. An advancement or solution to address one side of the equation benefits the other.

Mr Bill Gates (Bill & Melinda Gates Foundation) took to the stage with an optimistic look at how human ingenuity can make a huge difference to global health. He ascribed the success of halving global deaths of children (aged under 5 years) since 1990 **to a triumph of science, and also to a triumph of partnerships**. He outlined the core purpose of the Bill & Melinda Gates Foundation is to address poverty-related diseases – an issue the market is not able to address by itself. The challenge remains, with R&D spending decreasing despite millions of people still in need, an issue Mr Gates attributes to risk-aversion. However, with the right partnerships, the R&D risks can pay off. He described the recent partnership between the Bill & Melinda Gates Foundation and the Novo Nordisk Foundation in demonstrating that CO₂ can be removed from the atmosphere to make acetate, which can then be used in fermentation processes to create proteins for human consumption. This decouples food production and land use to create a more sustainable (and efficient) system. Other signs of ingenuity-driven success include water surveillance for pandemic preparedness, accelerated by AI and machine learning; AI-supported drug development (cutting lead time and reducing off-target effects) and healthcare delivery, including increasing healthcare support to LMICs; and a deeper understanding of the role of the microbiome in nutrition. Nutrition, in particular, is at the heart of everything the Bill & Melinda Gates Foundation stands for. If every child was adequately nourished to not just survive, but to thrive, not only would child deaths decrease



but productivity and prosperity would increase, particularly in Africa. The impacts of nutrition and gut health also extend into other areas of wellness; for example, the effectiveness of oral vaccines, which is attenuated in malnourished children (where it is needed most). Mr Gates drew attention to the fact that, as over- and undernutrition share the same underlying pathologies, understanding these pathologies should be a shared global priority that can benefit countries at any income level. If we get things right, Mr Gates believes **the next decade could be a golden age of nutrition**; and good nutrition, coupled with new tools, can be the '1-2 punch' against IDs and to deliver justice in health.

Dr Tedros Adhanom Ghebreyesus, Director-General of the World Health Organization (WHO), shared his own personal history within Denmark and congratulated the Novo Nordisk Foundation on its achievement over the past century. He also explored general health changes over the past few decades. Since the late 1990s, the impact of NCDs has outweighed that of IDs in every region except Africa; **the climate crisis will exacerbate both NCDs and IDs – even without global conflict and mass migration**. The health challenges are not (just) scientific; they are geopolitical. It is not that there is a lack of knowledge



or tools; rather, it is **that the knowledge and tools are not where they are needed**. The response to COVID-19 was a stunning success of science, but unequal access to vaccines is a stain on the world's conscience. Dr Tedros reinforced the need for a One Health approach (considering humans, animals and the environment in unity) and the importance of both multisectorism and multilateralism given the social, economic and political challenges and the fact that a global threat necessitates a global response. He reflected on the very reasons why the United Nations and the WHO were founded and highlighted that these institutions are needed more now than ever before; and yet, they are being challenged by waves of nationalism. **No one is safe until everyone is safe, but attacks and disinformation risk undermining the mission of the WHO**. Dr Tedros concluded by reminding the delegates that pathogens have no regard for the lines humans have drawn on maps or for any other means we use to divide ourselves.

Dr Catherine Kyobutungi, Executive Director of the African Population and Health Research Center (APHRC) titled her presentation *From 17 to 4 Years*, referring to the aim to close the translation gap. Presently, it takes an average duration of 17 years to move from initial discovery to a tangible impact on lives. How can we reduce this duration to 4 years? Looking at the various elements of the polycrisis, Dr Kyobutungi highlighted that **whatever the problem is, it is always worst in Africa**, including the rising impact of NCDs creating the 'double impact' of NCDs and IDs. The APHRC seeks to challenge inequality and align Africa with developed regions of the world. The challenge is to **not only ensure translation but also to ensure translation can impact lives in Africa**. According to Dr Kyobutungi, the 'secret weapon' for Africa is its expats. She shared examples of successful

collaborations and local expertise and detailed her nascent platform for partnering African researchers with international collaborators.

Looking in more detail at translational inertia and overcoming the translational gap, Dr Kyobutungi highlighted that insights from only 14% of applied health research papers are actually translated into policies, products or technologies. A tremendous amount of university/research institute outputs exists only within an academic echo chamber with its impact limited to a vortex of journal citations. Therefore, there is **an enormous amount of untapped potential that can be capitalised upon if the right partnerships are formed, including bringing to the table people with the lived experience of the problem at hand**.

Prof. Mads Krogsgaard Thomsen, CEO of the Novo Nordisk Foundation, framed his presentation around the *Ten Societal Megatrends Affecting The Outlook For Human and Planetary Health*. In particular, he looked at three of the ten trends:

Urbanisation and the demographic transition are accelerating: There is an epidemiological transition whereby increasing GDP per capita is associated with a decrease in ID burden coupled with an increase in NCD burden. Today, globally, around 75% of deaths are due to NCDs rather than IDs. As Dr Kyobutungi described, Africa is now seeing the greatest increase in prevalence of diabetes.

Climate change calls for urgent action: Heat-related mortality is increasing, driven partly by increases in cardiometabolic diseases. As temperatures increase, the incidence of stroke, coronary heart disease and cardiac arrest increases in step. Moreover, increasing temperatures are associated with migration of vectors and with them, vector-borne diseases. Climate change also increases the risk of numerous other IDs, such as water-borne disease or specific bacteria and viruses.

The food insecurity situation is worsening: Even under 'best-case' scenarios of climate change, food insecurity will increase as current crops produce less protein content, together with crop losses from extreme weather and pests. The double disease burden is aggravated by the interaction between NCDs and IDs; chronic NCDs such as diabetes increase the risk from other IDs such as TB. Diseases we thought were on the way out will begin to increase again.



Challenges

Ten societal megatrends affecting the outlook for human and planetary health

- 1 We're living in the planetary "overheat era"
- 2 Urbanization and the demographic transition are accelerating
- 3 Climate change calls for urgent action
- 4 A new economic and geopolitical balance is emerging
- 5 Our demographics are undergoing rapid change
- 6 Global health inequities are growing in number and complexity
- 7 The food insecurity situation is worsening
- 8 There is an increasing need for transforming the energy sector
- 9 Data, automation and AI are reshaping the global economy
- 10 The science ecosystem is evolving

Prof. Thomsen stated the strategy should be prevention rather than treatment. Emphasising that **one cannot solve complex diseases with simple solutions**, he highlighted the various collaborative research centres and initiatives funded by the Novo Nordisk Foundation and provided examples of success.

During the panel discussion, the group first explored key learnings from the COVID-19 pandemic. As Dr Kyobutungi put it, the world moved on like those in Africa didn't exist. Her goal is for every country, in every region, to have its own capabilities so they do not have to rely on others. Mr Gates added that, **we cannot just look at the inequality in LMICs in times of crises; rather, it needs to become part of our everyday thinking**. Solutions need to always have resource-limited settings in mind. The 'easy' solution to getting more protein is the high-cost intervention of more eggs, meat and fish, which is not scalable globally. Dr Tedros drew attention to the Pandemic Agreement under development, that COVID merely exposed inequalities that were always present, and

how the agreement seeks to ensure that addressing equity is central to further pandemic preparedness planning. The **political element is always a crucial challenge**: a population will blame their government for a shortage, but no one is blamed for over-supply, so the political tendency is for national self-interest and vaccine hoarding. It is hoped that the Pandemic Agreement will help address this.

This was reinforced by Prof. Thomsen who highlighted the **need to address the full value chain: the scientists, the innovators, the policymakers, the politicians and the public**. Private industry may be answerable to its shareholders, but work can and should be shared pre-competitively. Mr Gates drew attention to the well-established practice of tiered pricing in medicine, which has worked well to ensure returns on R&D investment for companies while enabling reasonable access to medicine for the world's poorest. At its close, the discussion returned to the importance of partnerships. As Dr Kyobutungi reminded us: **if you want to go fast, go alone; if you want to go far, go together**.



Connecting health and sustainability in a time of polycrisis: transcending borders to create new scientific breakthroughs

In the presentation to open this session, **Dr John-Arne Røttingen** (CEO of Wellcome Trust) outlined the challenge ahead. **How can we build a healthier future given the climate crisis, the rise of nationalism and disinformation, rising lack of distrust in science and the knowledge that the COVID pandemic is not the last?**

Dr Røttingen gave an overview of Wellcome's mission and its well-established commitment to work within LMICs as a truly global organisation. He was able to draw on Wellcome's work in discussing some of the potential effects of climate change, for example, cyclone and cholera in Malawi, the effect of droughts on adherence to HIV medication, and increased severity of outbreaks and epidemics. Dr Røttingen highlighted that it is the richest countries that contribute the most to climate change, but it is the poorest countries feeling the greatest impact.

Dr Røttingen returned to the lessons of the COVID-19 pandemic, drawing attention to the government and market failures as well as the amount of vaccine misinformation. He described the challenges in getting a 'health day' added to COP28 since the **impacts of climate change on health had not been part of prior discussions, but are crucial to ensuring appropriate action.** With better data comes better evidence and better solutions. Dr Røttingen highlighted the Gates Foundation's *Global Burden of Disease* and Wellcome's *Global Countdown*

as exemplar initiatives in terms of establishing a collective science base to ensure quality and consistency of longitudinal data. He also highlighted the WHO-convened initiative, the Tuberculosis Vaccine Accelerator Council, that can help drive translation by being ready to implement and scale-up successful tuberculosis initiatives, such as the work by Wellcome and the Bill & Melinda Foundation (with a tuberculosis vaccine in Phase 3). Once again, the value of collaboration and partnerships was made clear: **while solutions are being developed, work should be ongoing to prepare the policy and practice space for scale-up.**

During the associated panel session, **Dr Alaa Murabit** (Director, Program Advocacy and Communications, Health, Bill & Melinda Gates Foundation) outlined her experiences as a Libyan woman working through war, and noted how war may be viewed as a microcosm of crises. As Dr Murabit described, **crisis isn't a particular moment or action, but rather a sustained lack of leadership, commitment or accountability.** Her own challenges were in providing a voice for women in some of the conflict resolution pieces and building a new charter for women against a backdrop of religious bodies; her solution is to work with the religious bodies and use the influence they have. **In any crisis, people do not care what the crisis is, they care about the impact on their lives and livelihoods.** The approach one should take is to establish the capabilities of each stakeholder and what they can achieve, then use those capabilities and skill sets to improve lives and livelihoods.

Prof. Flemming Konradsen (Senior Vice President, Social & Humanitarian, Novo Nordisk Foundation) touched on the importance of connected solutions given the connected problems of the **'double health burden' of NCDs and IDs.** Currently, there are 80–85 countries stuck in the double health burden zone, with a significant proportion of disease from infection, maternal and neonatal health challenges, malnutrition, etc. However, there will be a rapid growth of NCDs, so it is not an acceptable solution to say: "we'll deal with ID first and then pivot to NCD". Keeping vertical programmes results in a very inefficient healthcare system: rather, **addressing NCDs needs to be a key role of primary care.**



Prof. Krishnaswamy VijayRaghavan (former Principal Scientific Adviser to the Government of India) used his personal experience of pivoting from IDs to NCDs in India. While India is at that inflection point of IDs coming down and NCDs going up, a particular challenge in India is the large young demographic. **If that population is exposed to the double health burden of ID and lifestyles that lead to NCDs, leading to burden at a younger age, it will cripple the economy.**

Responding to a question from the audience, Dr Murabit returned to the topic of trust and disinformation. The key element is who represents global health. **If people trust the messenger, they will trust the message.** According to Dr Murabit, the key is finding a third-party narrator and a third-party narrative. One cannot counter ‘vaccines are bad’ with a simple ‘vaccines are good’; rather, you need to engage the communities you want to help and coarchitect solutions with alternative messages.

Addressing the question of why scientific breakthroughs are rare, **Dr Lynda Stuart** (Executive Director, Institute for Protein Design) disagreed with the question. **There are tremendous numbers of scientific breakthroughs and innovation – and those that are commercially viable succeed – the problem is a failure of translation.** To address this, we need forward-thinking funders and a slightly different model for translation, particularly translating solutions that are addressing market failures. Dr Stuart highlighted the incubator within her own institute and Novo Nordisk Foundation’s BioInnovation Institute as examples of models to help drive translation from intersectional science.

Dr Røttingen further addressed market failures with regard to healthcare. We have decided that the private sector sorts out healthcare and have taken a hands-off approach, but in other sectors innovation is driven by the buyers of innovation itself (e.g. military spending). Foundations can come in and provide ‘push’ incentives, but there also **needs to be a move to public health ‘pull’ incentives** in tandem, at least for priority areas. Prof. Konradsen also linked the importance of working with institutions to ensure representation, to ensure we listen to countries and involve the end users of innovation.

Thinking about how we can drive translation, Dr Stuart reinforced the importance of starting with an end in



mind. First, understand the problem you are trying to solve and then begin with a very ‘gentle touch’ as innovators explore potential solutions. However, **once you have a working idea, you need rigour and focus to drive it forward into the world.** Crucial to this is bringing together the right people (including those with the lived experience and expertise) to ensure the solution is the right one, any barriers are ready to be taken down, and it is ready to go into the world.

Dr Stuart further discussed innovation in relation to a question from the audience on how to sustain investment in one area in the face of polycrisis. Just as innovation (and translation) needs to take place with a clear understanding of the lived experiences of those facing a particular problem, **the polycrisis should always be in the background when thinking about innovation.** One cannot address one incipient crisis only for another to flare up.

Dr Murabit was asked for her advice on how to change the narrative on health and climate to build resilience. The issues highlighted by floods and



cyclones were already there, but are now exposed due to these extreme events. There is a need to build infrastructure but also ensure key areas are not neglected. For example, **woman and children are neglected when it comes to R&D and they are not 'at the table' when thinking about R&D**. Dr Murabit mirrored Dr Stuart's sentiment on the importance of starting with an end in mind, highlighting the need to think about the end user in a time of crisis. **If a solution is not going to work in a time of crisis, then it is not going to work.**

Prof. VijayRaghavan outlined how widespread uptake of mobile telephony allowed India to 'leapfrog' past many intermediate solutions, skipping straight to digital payments and digital health. The added value is that one obtains the data quicker, accelerating the journey to refining solutions.

Taking questions from the audience, the discussion turned to how to handle governments that hinder efforts. Prof. Konradsen acknowledged that there are indeed some states that have simply failed and it is a case of working around these issues. The population want to see children fed so one needs to **work with local representatives and initiatives, find ways to unite and build trust with local communities**, then expand (and support good politicians). Dr Røttingen, drawing on his previous role as Ambassador for Global Health at the Ministry of Foreign Affairs, Norway, referred to this issue as the 'million-dollar question' that has yet to be solved. Accountability must be held to both the donor and recipient country.

The key is to create visible results, and the challenge is to work with a 20–30-year perspective in mind, meaning one must think fast and slow at the same time. Prof. VijayRaghavan added the important need for local populations to drive the 'pull'. If you say you will solve a problem on behalf of a population, and then it is not solved, it becomes your fault.

Dr Murabit then showcased a range of innovative solutions that demonstrate keeping in mind the end user in a resource-limited setting, including an AI-enabled ultrasound that can be used with no skill or training and a simple \$1.70 plastic drape to measure post-partum blood loss. Championed by local healthcare professionals, this simple drape helps decision-making with regard to intervention and has reduced maternal deaths by 60%.

The concluding discussion returned to political problems, with Dr Murabit reiterating that the real crisis today is a crisis of leadership and that, **if you want to address global health, then you need to get interested in politics**. Prof. Konradsen also stated that 'policy matters' and encouraged attendees to be unafraid of 'getting into the flesh of producers'. Finally, Dr Stuart was asked to turn once again to the learnings from COVID-19, specifically in terms of scalability. As she summarised, 'we knew we had vaccines that probably worked, but no one wanted to take the financial risk to scale manufacturing, which created scarcity and drove inequality'. This created global distrust and **when it comes to money or lives, we should prioritise lives**.



How climate change affects non-communicable diseases: challenges and mitigation strategies

In his keynote lecture, **Prof. Walter C. Willett** (Department of Epidemiology and Nutrition at Harvard T.H. Chan School of Public Health) underscored the **urgent need for strategic shifts in both agricultural practices and dietary habits to address climate change and promote global health**. Climate change is an escalating challenge marked by non-linear, accelerating changes and tipping points, such as the irreversible melting of the permafrost and the opening up of the Arctic Ocean. These changes create a vicious downward cycle, exacerbating global warming faster than previously anticipated.

The Intergovernmental Panel on Climate Change has outlined a path to limit global temperature increase to below 2°C, and achieving this goal requires reducing greenhouse gas (GHG) emissions from fossil fuels to virtually zero as rapidly as possible. However, **GHG emissions from the food system are predicted to double by 2050** and if these are not addressed, then even eliminating fossil fuel consumption will not be enough to stay within the 2°C limit. In addition, a significant investment in agricultural research is crucial to develop methods for carbon sequestration and ensure these practices are sustainable.

The **EAT-Lancet Commission** on Food, Planet, Health, funded by Wellcome and co-chaired by Prof. Willett, brought together 35 scientists from 17 countries to create the 'planetary health diet'. Evidence shows that adhering to the **planetary health diet correlates with lower mortality rates and reduced environmental footprints**, including a 30% reduction in total mortality for those closely following the diet, 29% lower GHG emissions, and a 51% reduction in cropland use primarily due to decreased demand for animal feed. However, there is less benefit in terms of reduced water usage as growing fruit and vegetables still requires irrigation. The updated EAT-Lancet report will emphasise translating the planetary health diet to different



regions and cultures, integrating traditional diets – often aligned with the planetary health diet, but at risk from industrialisation – and addressing justice and inequality issues more explicitly.

Prof. Willett explored how the **complex climate crisis requires multifaceted actions across various sectors**, including:

- Schools and childcare: promoting healthy eating habits.
- Healthcare: integrating nutrition education.
- Worksites: supporting healthy food choices.
- Food environment: making healthy and sustainable foods desirable.
- Built environment: encouraging physical activity.
- Mass media: reducing junk food promotion.
- Research and education: driving innovation and knowledge.
- Economic policies: leveraging financial incentives for sustainable practices.

Effective climate action requires top-down leadership and bottom-up initiatives. Individual actions at family, community and local levels are crucial in setting examples and overcoming barriers, ultimately contributing to global change. Education is also essential, because only by understanding the broader

The Planetary Health Diet

The aim of the EAT-Lancet Commission's planetary health diet is to provide a future global population of 10 billion people with a healthy diet within planetary boundaries. The diet is composed of:

- Half of the plate consisting of fruits and vegetables.
- Whole grains and mostly plant-based proteins.
- Healthy fats and minimal sugar.
- A modest amount of animal-sourced foods.



picture will individuals be empowered to make meaningful contributions to the climate crisis.

For the panel discussion that followed, Prof. Willet was joined by **Dr Bente Mikkelsen**, Director for Noncommunicable Diseases, Rehabilitation and Disability at the WHO; **Dr Rachel Nugent**, Senior Technical Advisor at the Center for Global Noncommunicable Diseases, RTI International; and **Dr Poornima Prabhakaran**, Director of the Centre for Health Analytics Research and Trends, Trivedi School of Biosciences and Ashoka University and Centre for Chronic Disease Control.

Dr Mikkelsen emphasised the urgent need for comprehensive strategies that combine global awareness, political engagement and practical solutions to address the intertwined crises of climate change and NCDs in particularly vulnerable regions such as Small Island Developing States (SIDS). This involves **integrating health considerations into broader governance frameworks and ensuring that health systems are equipped to handle both chronic diseases and the impacts of climate change**. She highlighted the concept of a ‘syndemic’ wherein climate change exacerbates the already significant burden of NCDs (which cause 74% of all deaths globally), causing severe health impacts such as heat-related deaths, heart attacks, strokes and brain damage, and explained how SIDS face a severe burden from both climate change and NCDs, exacerbated by mental health issues and commercial determinants of health (e.g., dumping of unhealthy foods on SIDS as imports from more developed nations). These regions lack the governance capacity and regulatory systems needed to manage these dual crises effectively. They are typically middle-income countries but are heavily reliant on international funding and are unable to build resilient health

systems due to ongoing crises. They lack accessible systems for chronic disease management, often transitioning from one crisis to another without long-term solutions. In 2023, the WHO organised two key meetings (one technical and one ministerial) with the SIDS to address these issues, and the resulting Bridgetown Declaration on NCDs and Mental Health emphasises the need for bottom-up engagement and integration of health considerations into governance and universal health coverage.

Dr Prabhakaran stressed the importance of addressing the inequitable health impacts of the climate crisis, not just in terms of conducting relevant research, but presenting it effectively to policymakers and ensuring resource allocation aligns with the needs of the most affected regions. By demonstrating the immediate health benefits of addressing tangible issues such as air pollution, there is a greater chance of fostering action and integrating climate considerations into health policies. She noted the disparity wherein **only about 10% of research occurs in regions bearing 90% of the disease burden**. And, referring back to Dr Kyobutungi’s presentation the previous day, resources are often misallocated, favouring publications over practical, ground-level needs. Research should be based on need and timely to influence appropriate policies and programs. Effective resource allocation and capacity building are crucial, especially in countries lacking research infrastructure. **Policymakers require narratives different from academic presentations; they need practical messages that illustrate the tangible benefits of interventions**. Dr Prabhakaran gave an example from India (which has the dubious distinction of being host to 15 of the 20 most polluted cities in the world), where linking air pollution to increased hypertension in Delhi demonstrated how reducing pollution could lower hypertension prevalence, easing the burden on health systems and redirecting resources to other health issues. In addition, since air pollution is increasingly recognised by the public and policymakers as a significant issue, linking it to health outcomes, such as hypertension, helps translate the more ‘abstract’ concept of climate change into concrete, relatable terms.

Dr Nugent discussed the **necessity of integrating economic analyses into climate and health policies to garner support from decision-makers**. Transforming food systems to align with planetary health goals can yield significant economic and health benefits. Prof. Willett warned that powerful economic interests and

resistance pose substantial challenges, therefore comprehensive policies and public support are crucial for a successful transition.

An audience poll showed that 82% supported stopping the serving of red meat, such as at conferences and similar settings. **Shawn Baker** (Chief Program Officer with Helen Keller International) highlighted the importance of animal-sourced foods for nutrition in LMICs, particularly for infants and young children, **cautioning against one-size-fits-all solutions imposed by the Global North**. Prof. Willett clarified that the planetary health diet does not apply to children aged under 2 years and stressed the need for tailored nutritional strategies.

Returning to the urgent need to understand and address the connections between climate change, air quality and NCDs, Dr Prabhakaran emphasised the importance of research in identifying these connections, especially in countries most affected. She shared more insights from India, where a national model for exposure to particulate matter and high temperatures is helping to link to health outcomes such as hypertension and diabetes. However, she stressed the **challenges of accessing high-quality data and the need to empower healthcare professionals to recognise and respond to climate-related health issues**.

Dr Mikkelsen emphasised the **importance of research-to-policy and policy-to-action processes, but noted the lack of research on implementation**. She highlighted the need for social mobilisation to raise awareness about the health impacts of climate change, prompted by recent heatwaves in Europe that led to 60,000 deaths from cardiovascular disease, stroke, kidney failure, and others, and called for collaboration with civil society. Dr Mikkelsen also discussed WHO's efforts to engage with the private sector on issues such as unhealthy food and emphasised the role of science in driving global leadership and policy interventions, such as the inclusion of air pollution as a risk factor in NCD discussions.

Dr Nugent highlighted the significance of fiscal policies, particularly health taxes such as those on sugar-sweetened beverages, which have been implemented in 117 countries. These policies deter unhealthy consumption and generate revenue that can be directed towards health programmes, such as school feeding initiatives. However, she acknowledged the challenges in implementing these taxes, citing political and technical obstacles, and stressed the

importance of complementing taxes with other regulatory measures, such as marketing restrictions and packaging labelling, to create a comprehensive policy framework. Despite the effectiveness of such measures, she cautioned that they alone are insufficient to address the broader issues of unhealthy eating habits and the associated health impacts. There is a need for transformative changes in the food system – the potential economic benefits are significant – which calls for bold and innovative strategies to tackle the urgency of the situation. However, we must recognise the limitations of current approaches. There is a **need to build political will to drive systemic changes which, while challenging, is necessary to achieve meaningful progress in public health outcomes**.

To close the session, the panel was asked to imagine meeting at a future conference in 3 years and to reflect on their contributions to mitigating the impact of climate change on NCDs. Prof. Willett highlighted the importance of working with the culinary world to promote healthy eating habits, drawing parallels with the cultural shift that occurred with smoking cessation. He emphasised the need to **position healthy eating as aspirational and beneficial for both individuals and the planet**. Dr Mikkelsen discussed the significant breakthrough of **measuring climate progress in terms of lives saved**, following a high-level political meeting on NCDs. She underscored the importance of investing in chronic disease management to address syndemics effectively. Dr Nugent humorously remarked on her commitment to **adopting a healthy diet and influencing others to do the same**, emphasising individual responsibility in promoting healthy lifestyles. Finally, Dr Prabhakaran highlighted advancements in strengthening the evidence base linking climate change to NCDs, thanks to partnerships formed in 2024. She emphasised the **utilisation of research findings to inform policies across health and non-health sectors**, leveraging innovative technologies such as AI for global benefit and for future generations.



Climate change: the impact on infectious diseases and the food system: What is the scale and how do we build resilience?

Prof. Katherine Richardson (University of Copenhagen) began her keynote lecture with a familiar but still striking image of the Earth seen from space to illustrate the **critical interconnectedness of the Earth's geosphere, biosphere and the emerging anthroposphere.**



Earth's resources are finite, and Nature has managed to survive by creating a 100% circular economy. It is this delicate balance that has allowed humanity to thrive, and it is important to recognise that modern humanity's existence and, in particular, modern civilisation has flourished thanks to the stable conditions that have prevailed for the past 12,000 years.

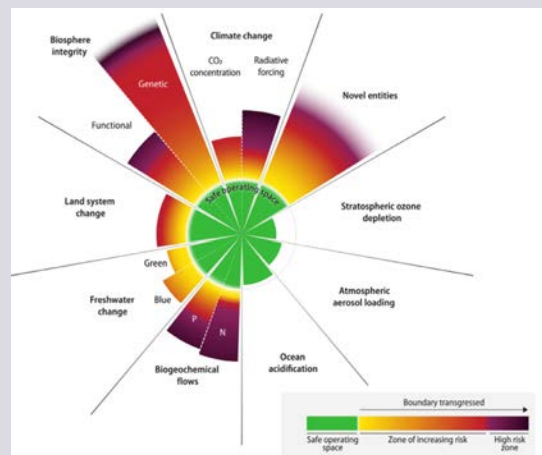
The Earth's climate, influenced by external factors such as its orbit around the Sun and internal factors such as the geosphere and biosphere, is unique due to the presence of life. Life interacts with and transforms the planet's elements, maintaining the conditions necessary for its own survival. This interaction is vital and has often been overlooked in scientific discourse, which has historically focused on individual components rather than their interactions.

Prof. Richardson explored the concept of planetary boundaries, developed along with Johan Rockström and the late Will Steffen. These boundaries define the safe operating space within which humanity can continue to thrive without risking catastrophic changes to Earth's conditions. Currently, **humanity has transgressed six of these nine planetary boundaries**, with trends worsening since 2015. This does not guarantee immediate disaster but significantly increases the risk of destabilising Earth's systems, similar to how high blood pressure raises the risk of heart disease. **The anthroposphere – human activity – has become a significant force altering both the geosphere and biosphere.** Our current era, known as the Anthropocene, recognises the capacity of human activity to change Earth's conditions by impacting the

energy balance (climate) and life conditions, which in turn affect the geosphere and biosphere. It is important to understand the Earth as a complex adaptive system, in which interactions among components are crucial. This systemic approach is necessary for building resilience in areas such as food and health systems. For example, the loss of biodiversity, primarily driven by agriculture, significantly impacts both climate stability and the emergence of IDs. The COVID-19 pandemic illustrates how human disruption of ecosystems can lead to zoonotic diseases, highlighting the need for systemic thinking.

Prof. Richardson concluded by drawing a parallel with Darwin's evolutionary theory, suggesting that society is undergoing a similar revolution in understanding. Just as Darwin revealed that humans are a product of evolution, not separate from other organisms, we must now recognise that **humanity is an integral part of the Earth's ecosystem.** This recognition is essential for addressing global challenges and achieving resilience in our food and health systems, emphasising the **need for holistic and systemic approaches to sustainability and survival.**

The **planetary boundaries framework** identifies nine processes that are critical for maintaining the stability and resilience of Earth's system as a whole. Current research shows that six of the nine planetary boundaries are being crossed (while others are close to being breached or already exceeded regionally), suggesting that Earth is now well outside of the safe operating space for humanity.



The next keynote speaker was **Sir John Bell**, President of the Ellison Institute of Technology (EIT) and Co-CEO of EIT Global, who acknowledged the **profound impacts of climate change on IDs and emphasised the need for integrated, system-wide solutions**. The Ellison Institute aims to use technology to address interconnected problems in medical science, healthcare, food security, sustainable architecture, clean energy and climate change. However, he stressed that **you cannot wait until you get to the finish line before you consider policy**; it is important to incorporate public policy early in the innovation process, and this is why EIT collaborates with the Tony Blair Institute.

Sir John focused on two programmes initiated by the Ellison Institute. The first is a pathogen surveillance programme that implements a 'full-stack' sequencing solution for pathogen diagnostics, feeding into a global surveillance system. This initiative is crucial for monitoring and responding to IDs, particularly in the context of climate change. The second programme focuses on indoor growing to address agricultural challenges exacerbated by climate change. This initiative aims to create controlled climate environments using advanced greenhouse technologies, enhancing yields and resilience to climate impacts.

Climate change is altering patterns of waterborne and vector-borne diseases, increasing agricultural intensity and antibiotic use, and leading to more antimicrobial resistance (AMR). Crowding of animal and human populations increase the likelihood of cross-species disease spread, and climate-induced events such as the recent floods in Kenya leads to disruption of health systems. Yet **despite promises from governments around the world, there remains a lack of global surveillance systems post pandemic**, so the EIT has opted to take a lead role in establishing a comprehensive surveillance network. This pathogen detection and surveillance system is very analytically driven, and has taken a 'full-stack' approach, going all the way from sample collection at the bedside to sequencing diagnostics (to aid understanding of AMR) through the analytics. This is then put in the cloud to allow clinical diagnostics. EIT is also supporting the creation of clinical research networks in Africa to conduct onsite research and that are helping to advance vaccine development in Oxford, UK.

Regarding agriculture, the Sensei Ag initiative aims to revolutionise indoor growing environments



with modular, hydroponic greenhouses that utilise advanced sensing, robotics and automation. These greenhouses have been designed to optimise conditions for various crops and could be deployed globally, particularly in sub-Saharan Africa. Rather than a solution that will feed the world, this approach **offers a buffer against climate change impacts by providing controlled growing environments**.

It is hoped that these efforts will make significant contributions to addressing the critical areas discussed at this year's Global Science Summit, moving the story forward, and providing practical solutions to the challenges posed by climate change.

For the subsequent panel discussion on solutions and scaling, the two keynote speakers were joined on stage by: **Dr Maria Neira**, Director, Environment, Climate Change and Health at the WHO; **Prof. Jeremy Hess** from the University of Washington; **Prof. Jan C. Semenza**, Project Manager, Section of Sustainable Health at Umeå University; and **Ms Fahreen Chudasama**, Director of Development Cooperation at AGRA.

Dr Neira emphasised the **need to integrate health arguments into climate change discussions, especially in vulnerable regions such as sub-Saharan Africa and Southeast Asia**, which contribute least to CO₂ emissions but suffer the most severe consequences, including increased IDs and food insecurity. The WHO is working on providing scientific evidence, prioritising research and helping countries adapt their healthcare systems to be more resilient. Dr Neira underscored the need to transition away from fossil fuels, adopt sustainable food systems and plan healthier urban environments to reduce air pollution and enhance public health.

Prompted by a question from Søren Nedergaard (COO, Novo Nordisk Foundation), Sir John Bell discussed the challenges of translating scientific innovations into political action and emphasised the **necessity of shaping the policy environment from the beginning of the innovation process to ensure successful implementation.**

Prof. Richardson stressed the complexity of the transition required to address climate change. She identified **five essential levers: technology, behaviour, economic systems, governance and capacity building,** and pointed out that merely focusing on technology is insufficient without considering how it is used. She mentioned the current debate on taxing farmers for GHG emissions and the need to adjust economic systems to incentivise necessary climate actions.

Ms Chudasama discussed the significant challenges faced by Malawi's food systems due to climate shocks, such as reduced agricultural productivity and increased urban migration. She highlighted AGRA's efforts to support farmers by promoting early generation, climate-smart seeds, and biofortified crops such as high-iron beans to enhance nutrition and soil fertility. AGRA also supports developing a national food system strategy and food balance sheet for Malawi to improve decision-making and early warning systems, ensuring more resilient agricultural practices and food security.

Prof. Semenza shared insights from historical and recent heat waves, emphasising the need for effective heat health action plans. He described how **community engagement is crucial for successful disaster response,** using Nepal's flood early warning systems as a case study. Prof. Semenza called for a lateral approach in public health, engaging communities to prevent heat-related mortality, which is entirely preventable with proper planning and community involvement. He also despaired at what he perceived to be a lack of interest from the media in reporting the severity of the situation, even after tens of thousands of deaths occurred after the biggest heat wave in Europe.

Prof. Hess recounted his personal experiences during the 2021 heat wave in Seattle, highlighting the distressing impact and the need for better preparedness. He described a platform developed to assess heat risk at the neighbourhood level, which aids to ascertain where to target interventions, thus enhancing health system resilience. This platform inventories risk drivers and links them with effective intervention strategies, providing crucial data to local decision-makers. Prof. Hess emphasised the **importance of data synthesis and accessibility to inform local actions and prevent health system crises.**

A question from Kasim Kutay (CEO, Novo Holdings A/S) addressed the political impracticality of carbon taxes due



to the cost-of-living crises and inflation, and suggested focusing on nuclear power (fusion and fission) as a viable solution. Sir John Bell acknowledged the potential of small nuclear reactors and advancements in fusion technology. He highlighted that using AI and modelling could significantly reduce the time required for material testing in fusion reactors, making it a feasible near-term solution. However, Prof. Richardson argued that relying solely on technological solutions such as fusion – “which is always 30 years away” – is misguided. She emphasised **the importance of managing our relationship with the environment continuously rather than seeking a single solution**, and suggested that while fusion may become viable, it is crucial to focus on sustainable practices and managing biogenic carbon in the interim.

Dr Neira explored the **need to depoliticise climate change and to frame it as a public health issue** rather than a political issue. She suggested using health outcomes, such as the reduction of asthma cases, to communicate the benefits of policies aimed at reducing air pollution, and argued for **empowering mayors with health data to support unpopular but necessary interventions** and for presenting positive and actionable messages to the public.

Prof. Semenza then discussed using AI to predict West Nile fever outbreaks in Europe, emphasising the importance of climatic variables over traditional entomological and ornithological data. He highlighted the potential of AI and satellite data in creating early warning systems and called for a **cultural shift towards engaging tech talent in public health**.

Prof. Hess compared the impact of climate change on health to the HIV/AIDS epidemic, suggesting that climate change could lead to significant mortality if unmitigated. He stressed the need for more comprehensive etiologic research and forthright thinking about interventions to address the broad health implications of climate change.

Ms Chudasama mentioned the Africa Food Security Initiative, which aims to address undernourishment and improve the food production infrastructure in Africa. She emphasised the need for **public-private partnerships, investment in data and analytics, and strengthening trade corridors to enhance food security**.

When asked whether they thought the impact of climate change on health could build momentum for climate change mitigation, Prof. Richardson was confident that public health concerns could prevent crossing the planetary boundary for aerosols, by linking air pollution with climate change in the public narrative. Prof. Semenza was hopeful but also concerned about the **influence of the fossil fuel industry in preventing change** and Dr Neira pointed out the significant subsidies governments provide to fossil fuels and the need for public pressure to change this. Sir John Bell highlighted the **need for governments to balance personal freedoms with the responsibility to protect public health**. Prof. Hess had the final word, stating that “the health co-benefit argument should carry the day. That’s the motivation for climate action from health.”



Cities at the intersection of climate change, NCDs, IDs and food systems

Rapid urbanisation is being seen across the world and brings with it an array of challenges. These include growing health risks (the double burden of IDs and NCDs), strained food systems, increasing migration, as well as challenges driven by the climate crisis in terms of health, nutrition and climate resilience. The city of Nairobi was selected as a 'case study' to explore the interconnected facets of a living, breathing city and how we might respond to the challenges presented by climate change using learnings from the morning's discussions.

The keynote speaker for this session, **H.E. Sakaja Arthur Johnson**, Governor of Nairobi City County, was unfortunately unable to attend as his city was grappling with the results of severe flooding. A striking example of the scale of the problems faced by many regions of the world and a call to action for those who managed to travel to Helsingør.

As a result, the entire session was given over to panel discussion on transforming cities in response to climate change and health challenges. The panellists **Dr Corinna Hawkes**, Director, Agrifood Systems and Food Safety, Food and Agricultural Organization; **Dr Raji Tajudeen**, Ag. Deputy Director General of the Africa CDC; **Clinical Prof. Tolullah Oni**, University of Cambridge and CEO of UrbanBetter; and **Mr Augustin Flory**, Managing Director, Innovative Partnerships and Development Finance at Gavi, the

Vaccine Alliance, brought diverse perspectives from their fields, discussing the **interconnectedness of health, climate resilience, urban planning and food systems**. There was also a contribution from **Mr Jeff Risom**, Partner & Managing Director, Gulf Region and Chief Innovation Officer at Gehl, who shared case studies.

Dr Tajudeen began by highlighting how recent climate events, such as flooding in Nairobi and disease outbreaks, have severely impacted African countries. The Africa CDC, under the African Union, has prioritised creating resilient health systems, especially at the primary care level, to withstand such shocks. Dr Tajudeen stressed the importance of political support and domestic resource mobilisation, arguing that African nations shouldn't solely rely on external aid. He also pointed out the necessity of **action-oriented partnerships and a whole-of-society approach**, integrating various sectors such as health, planning, agriculture and water resources to develop robust mitigation measures. In cities, the local government, particularly the mayor's office, should coordinate these efforts to ensure an effective response to climate challenges.

Prof. Oni has previously advocated for a broader definition of healthcare professionals that includes those working on urban infrastructure and policy. In conversation, she highlighted the **ongoing rapid urbanisation in Africa** – “something like almost 50% of the urban infrastructure investments that will be made by 2050 are yet to be made” – and the **significant opportunities it presents for shaping healthy, climate-resilient cities**. Prof. Oni noted the dual burden of IDs and NCDs in urban populations and described her experiences as a clinician in South Africa, where she observed rising multimorbidity at younger ages. She argued that **health and climate resilience should be central to urban development**, emphasising that cities function as complex adaptive systems in which interventions in one sector affect others. Prof. Oni identified **barriers to progression, such as the normalisation of unhealthy urban environments and the disconnect between exposure and health outcomes**, including a disconnect where an event happens in one part of a city and perhaps many months later there is an outcome in another



part of the city. She called for more integrated data and knowledge to guide urban health interventions and emphasised the role of mayors and urban systems in health promotion.

Mr Risom from the urban design consultancy, Gehl, illustrated practical approaches to creating healthier urban environments through the concept of ‘foodscapes’. He described projects in Copenhagen, Bogota and London where interventions were designed based on the daily experiences and needs of local youth. Mr Risom’s examples underscored the **importance of understanding local contexts and the need for integrated, multi-sectoral approaches to urban health**.

Dr Hawkes discussed the **critical role of food systems in urban health and climate resilience**. The level of interconnectedness of food production, marketing, distribution and consumption within cities means that changes in these areas can lead to multiple positive outcomes, including improved health, environmental sustainability and economic benefits. Dr Hawkes highlighted specific urban spaces where interventions can be particularly effective, such as urban greening, markets and schools. She detailed the complexities of implementing these changes, noting the involvement of various stakeholders, from health sectors setting food standards to small- and medium-sized enterprises providing healthier food options and logistics systems supporting sustainable procurement. She argued for leveraging the potential of cities to drive holistic change, despite the challenges of coordinating multiple actors.

Mr Flory highlighted three key areas of action: partnership models, focusing on the vulnerable and identifying interventions to mitigate shocks. He emphasised the role of partnerships, exemplified by Gavi, the Vaccine Alliance, which has significantly contributed to promoting equitable access to vaccines in LMICs. Mr Flory stressed the **importance of focusing on vulnerable populations within countries**, such as zero-dose children who have never received a vaccine and are often the most underprivileged. He underscored the necessity of identifying and implementing interventions that can effectively mitigate global health threats, such as routine immunisation as a frontline defence against epidemics and AMR (because vaccinated individuals do not need treatment).



The discussion turned to concrete solutions for addressing the health challenges in African cities, with a focus on youth-led action and innovative research approaches. Prof. Oni highlighted the importance of adopting citizen science approaches to understand and address health risks, particularly in urban environments. She described a research project in Lagos and Yaoundé that identified air pollution, lack of green space and injury risks as significant health concerns for physically active individuals in public spaces. Through partnerships with local governments and communities, Prof. Oni’s team deployed air quality sensors and engaged citizens in collecting data to inform advocacy efforts and drive policy change. This grassroots approach not only empowered communities to actively participate in addressing health challenges, but also led to the creation of UrbanBetter, an initiative focused on precision advocacy and decentralised knowledge production. By **leveraging citizen-generated data and engaging diverse stakeholders**, including young people, in decision-making processes, UrbanBetter has emerged as a valuable resource for driving inclusive and evidence-based urban health interventions.

Dr Tajudeen provided insights into the establishment and role of the Africa CDC in addressing health equity issues across the continent. Highlighting the importance of regional mechanisms and global collaboration, he emphasised the **need for transparent and accountable systems**, particularly in the context of pandemics like COVID-19. Dr Tajudeen also stressed the significance of vaccination efforts, especially targeting vulnerable populations and involving youth through initiatives such as the Bingwa (Swahili for ‘champion’) initiative.

Prof. Oni underscored the importance of implementing and funding partnerships in scaling up successful initiatives similar to the Bingwa initiative. Emphasising an Africa-led global approach, she highlighted the **role of local civil society organisations in setting up hubs to drive community engagement and health promotion efforts**.

Dr Hawkes addressed the challenges posed by ultra-processed foods in urban settings, emphasising the need for policy interventions at both city and national levels. She discussed examples of successful policies in countries such as Chile and Mexico, focusing on warning labels and marketing restrictions. Dr Hawkes also highlighted the complex realities faced by lower-income urban populations and the importance of holistic approaches taking into consideration intersecting systems such as housing, transportation and gender dynamics.

On answering a question from the audience, the discussion delved into the concept of disruption and transformation in public health. Dr Hawkes emphasised the incremental nature of transformation and the importance of **finding strategic entry points for change within existing systems**. Prof. Oni raised questions about the role of research in supporting disruptive interventions and highlighted the need

for nimble, transdisciplinary approaches to address complex challenges.

Mr Flory emphasised the importance of resilient health systems in the face of shocks such as floods, which can disrupt routine immunisation efforts and lead to disease outbreaks. Dr Tajudeen stressed the **need for both immediate responses and long-term strategies to strengthen local manufacturing capacity for vaccines**, thereby enhancing resilience and self-sufficiency; the aim is to scale-up vaccine manufacturing in Africa from the current 1% of need to 60% by 2040.

Throughout the discussion, the panellists emphasised the **necessity of integrated, cross-sectoral approaches to address the multifaceted challenges posed by climate change and urbanisation**. They highlighted the importance of political will, community involvement and innovative partnerships in building resilient, healthy urban environments. From equity in healthcare delivery to the role of research and the need for local manufacturing capacity, the insights shared underscored the potential for cities to serve as pivotal arenas for addressing global health and climate issues, provided there is a concerted effort to align various systems and stakeholders towards common goals.



Technology to push boundaries and facilitate scientific breakthroughs

At this point in the programme, discussions turned towards exploring the enablers of responding to the challenges outlined thus far: technological tools and financial instruments. To open the session on the first topic – technology to push boundaries and facilitate breakthroughs – **Dr Lynda Stuart** (Executive Director, Institute for Protein Design) delivered a keynote lecture detailing the current state of the art after a 50-year challenge to understand how proteins fold. Since 2021 and the advent of AlphaFold and RoseTTAFold (and the computing power necessary to drive such platforms), it has been possible to take a genetic sequence and accurately predict protein folding. This raised the idea that ‘**if we can design our own proteins, we can do better than evolution**’. To do so, the inverse protein folding problem needed to be solved. As Dr Stuart explained, this has been solved with three different AI algorithms – RFdiffusion, Protein MPNN and RoseTTAFold – each of which is a diffusion algorithm trained on various proteins. The result is an algorithm that can take a ‘blur of amino acids’ and generate a protein to design biologics and vaccines. It is now possible to design antibodies rather than raising them in an animal, and to encode antibodies against a protein even when its shape is unknown. We can now **marry the power of protein design with the speed of mRNA vaccine technology**. In the next pandemic, the tools will be AI-enhanced vaccine design with mRNA delivery, but the benefits of the technology extend beyond medicine. For example, enzymes can be designed to break down plastics, and proteins built to sequester carbon or drive artificial photosynthesis. We can create nanomaterials with Ångström-level control. For the discussion, Dr Stuart was joined by **Prof. Peter Krogstrup Jeppesen** (CEO, NQCP and Quantum Foundry), **Dr Corinna Cortes** (Vice President, Google Research) and **Dr Ismahane Elouafi** (Executive Managing Director, CGIAR). Dr Cortes briefly outlined her experience and Google’s commitment to better the lives of people. As she highlighted, she has been in machine learning for 30 years and has never seen rapid progress like the past few years. Diffusion models are now being applied to weather and traffic simulations with phenomenal accuracy. **The only limitation is the availability of high-quality data**.

Prof. Jeppesen gave an overview of his work outlining that quantum computing isn’t enabling anything at the moment – which may explain why it is not yet at the



forefront of peoples’ minds; however, it is likely to be an output opened up by the current AI revolution. Marrying AI and materials science, **AI can be used to build quantum computing units (QPUs) for parallel processing of vast amounts of data**. The potential from this AI-driven runaway expansion cannot be underestimated, as QPUs can be built in a variety of different ways, tailored to a particular use, case and problem.

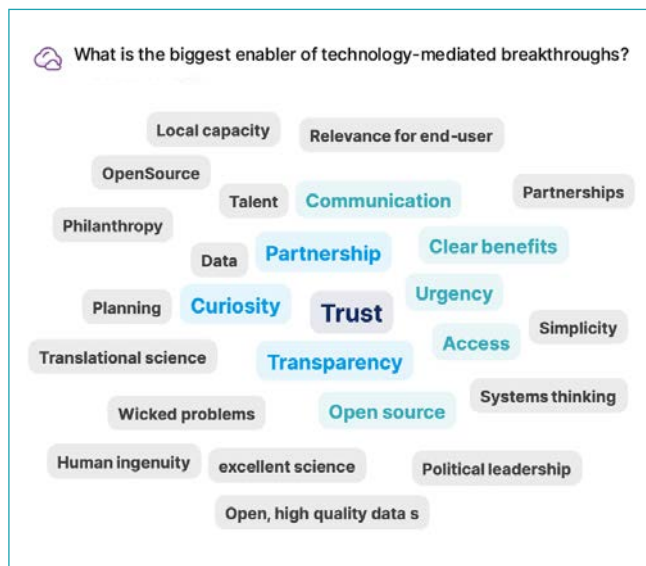
Dr Elouafi acknowledged the tremendous potential of the technology reviewed but highlighted that very little is currently benefiting the people. She reinforced the **need to ensure translation and to tap into local knowledge to ensure solutions are applicable to different populations**. According to Dr Elouafi, there is a need to employ the solutions we have today in the Global South in parallel with looking for future solutions.

Further to this, Dr Stuart reminded the audience of the translational programme at the Institute of Protein Design and its success in working with entrepreneurial post docs to spin out around 10–15 companies to date. However, she acknowledged that **while this has been great for ideas that are commercially interesting, other important assets struggle to be translated**, such as global public health vaccines, solutions with long lead times or that are high risk. As the institute’s vision is to spin out companies to provide solutions that make global impact and not to spin out companies to make money, they are **building capabilities to progress assets along the translational path for the problems where there is a lack of commercial pull**. Dr Stuart invited those in the

audience who can offer assistance to reach out to the Institute of Protein Design.

A comment from the audience drew attention to the energy required for AI, with emissions expected to equal those of the Netherlands within a few years. Dr Cortes highlighted that deep neural networks are indeed becoming bigger and faster. An additional consequence of this is that the models are so big no one can operate them apart from the big companies. She suggested that there should be a **focus on scaling down models to not only make them less resource-intensive but also to make them more accessible**. Prof. Jeppesen warned that, while a lot can be gained from developing more efficient algorithms, there will be a need for higher quality data to train the models.

One key element raised in the discussion based on audience ‘word cloud’ input was the need for public engagement and endorsement. **The ‘human factors’ were identified as the biggest obstacles to implementing technology-mediated breakthroughs**. It was reinforced that we cannot think about the system as a whole without the people factor; not only making it relevant to people but also exploring what you can learn from people. “If you do not consider the human factor upstream, then it will come back to bite you”. The human factor also brought the discussion back to the issue of trust. The term used was **‘trust crisis’: trust in ability and trust in motive**. Dr Stuart recounted how this was a particular element to be addressed early on in the work of her institute given the sheer power of the technology. Consequently, they ensure ethicist and philosopher involvement in their work while also making considerable efforts to explain the benefits clearly to ensure public awareness and support. **Resistance to new technology stems from fear of the unknown and a lack of understanding of the benefits**.



Delegate interactive feedback on enablers for technology-mediated breakthroughs, highlighting the importance of the ‘human factors’

Turning to the challenges of interdisciplinary and cross-sector work, it was highlighted that for complicated problems, **the more diverse the minds working on a problem, the more robust the outcome**. Dr Cortes also highlighted the need for education to understand not only the benefits but also the shortfalls of technology. Currently, generative AI suffers from hallucinations but outputs are taken as the truth. We are not open enough about talking about the weaknesses of AI and soliciting feedback. Prof. Jeppesen discussed the need for a common language to be able to talk across sectors throughout the many steps needed to solve complex problems. In addition, Dr Cortes highlighted the **delicate balance of data sharing versus privacy**. There is a trade-off in ensuring identity is not violated and adding noise to the signal.

To close the session, the panel was asked to look forward 20 years and speculate on how technology will have changed. The consensus was that eventually, with quantum computing and ever-more-powerful AI, **we will be able to model and mimic all of nature with simulations automatically ingesting data and noticing correlations we cannot see**. The walls between physics and biochemistry will be broken down. Feeding into the final session of the day it was highlighted that, in the next 5 years, the biological field will explode with enormous potential. The **challenge will be to ensure translation of the benefits** and, although technological enablers will be in place, financial models and political will are likely to remain key obstacles.



Translation and financial enablers for greater impact

The final session looked at the second ‘enabling’ element: financial models to facilitate translation.

A key component of the discussions centred on the balance between ‘pull’ factors (such as intrinsic features of the product and macroeconomic conditions) and ‘push’ factors (fiscal policies, such as taxation, rebates and interest rates); specifically, the question of how we can push when there is a lack of pull to ensure translational drive and societal impact.

Dr Cheryl Martin (Founder, Harwich Partners & former ARPA-E Director) and **Mr Jeppe Christiansen** (CEO, Maj Invest) began the discussion with a look at energy transition as a mitigation factor for climate change. Mr Christiansen described himself as an optimist with respect to energy transition, as most of the private sector understands the problem and is doing a lot of work to solve it; however, from the finance point of view, it is very slow. As Mr Christiansen pointed out, emissions are currently higher than they were at the time of the Kyoto Protocol. **As the cost of green energy is twice the cost of ‘dirty’ energy, there is limited pull from green innovation and money still flows into non-green energy.** Without a carbon tax or subsidies to bring down the multiplier for green energy, not enough capital will flow into green energy.

Dr Martin reinforced the great potential in the green transition, but also agreed that things just aren’t moving quick enough, highlighting that **science makes change possible; scale makes change happen.** No one wants to fund first-of-a-kind power plants; no one wants to take the risk. The question is, how we make creative capital stacks and reduce the risk? There needs to be some other way, such as an additional push from philanthropic ‘safety notes’, to reduce the risk.

Mr Christiansen outlined the three levers that can be used to speed up green transition: carbon tax, subsidy and innovation. These must be used to close the gap between ‘dirty’ and green energy.

Dr Martin shared an example of success in reducing cost and driving green transition in the form of CarbonCure (Canada). Their cement-curing process is cheaper, so it is easier to convince companies to introduce a greener process. She also highlighted that all big companies have net zero commitments,



which sends demand signals to the market. For example, Apple announced a commitment to carbon-free aluminium production and worked with the Canadian government to scale up production there. **Partnerships are needed for action, with the right people at the table with the right incentives to create demand.** Mr Christiansen repeated the need for a carbon tax as a clear answer, but politically, things are headed in the wrong direction. Dr Martin outlined that government mandates and regulation give clear roadmaps to drive innovation: companies will go with the cheaper option until the day the regulations hit.

Dr Martin and Mr Christiansen were then joined by **Mr Mads Nipper** (CEO, Ørsted), **Ms Gina Domanig** (Managing Partner, Emerald Technology Ventures), **Dr Johannes Fruehauf** (Executive Director, Biolabs/LabCentral) and **Dr Lars Frølund** (Lecturer, Massachusetts Institute of Technology and Board Member, European Innovation Council).

Mr Nipper drew attention to the ‘chicken and egg’ problem in which **there are no regulations without a product, but investors rely on regulations to sign over the capital.** Breaking this scenario will require political courage to offer rebates.

Mr Christiansen and Ms Domanig highlighted that **demand drives everything.** To be translated, an innovation must be something that creates market demand. Mr Nipper added that the broader financial picture can also play a part: offshore wind saw great success but at a time when funding was cheap. Dr Martin agreed that the impact of interest rate rises has dented efforts to decarbonise energy.



In exploring what is needed to tackle the implementation gap from the laboratory to real life, Dr Fruehauf highlighted that most therapeutics come out of academia and we ask academics to become entrepreneurs. Drawing on his own learnings and experience, the LabCentral infrastructure set out to **build a community and provide infrastructure to reduce risk and increase output, thereby increasing the chance of translational success.**

It was highlighted that any startup is dependent on external finance and new ideas need to be able to sell against incumbents. Offering targets for solution development can also be a way to drive innovation. The example of the DARPA programme to build a portable GPS was given: by offering a target of <10 lbs (4.5 kg), potential innovators knew that if they hit that target, they would have a market.

A challenging response from delegates encouraged a discussion on the **ethics of putting financial returns above global health.** However, the financiers in the room

highlighted that while certain funds exist, the majority of funds need to deliver return for investors. The role of philanthropic funds in supporting innovation was discussed, but it was highlighted that these funds are just a drop in the ocean. Mr Christiansen repeated the **crucial need for regulation to drive capital flow.**

Ms Domanig gave the example of PFAS*. It was known for decades that the ‘forever chemicals’ were an environmental and health disaster and many start-ups offered alternatives; however, because there was no market, it was impossible to invest, and these start-ups died. It is only now with the push factor of regulation in the US that the market has been created and potential non-PFAS-containing solutions have become viable products.

The conclusion of the session was that **current financial instruments are not helping.** Venture capital will not be able to help without regulation. However, while global power is needed, **the shift towards protectionism and nationalism is concerning.**

***PFAS: Per- and polyfluoroalkyl substances**

A complex group of synthetic chemicals used in consumer products from packaging to non-stick cookware, lubricants and clothing since the 1950s. Often referred to as ‘forever chemicals’ they can take over a millennium to degrade and are now widespread in the environment (including rainwater) and accumulating in the bodies of most of the world’s population. Two forms (PFOA and PFOS) were classed as carcinogenic and reprotoxic by the EU in 2019 and are also known to increase risk of dyslipidaemia. While manufacturers were aware of toxicity concerns since the 1970s, the EU proposal to ban PFAS product, use, sale and import was only submitted in January 2023 and has yet to take effect. In April of this year, the US EPA also designated PFOA and PFOS as hazardous substances and introduced legislation to control PFAS and safeguard drinking water standards.

Concluding remarks

To conclude the Global Science Summit 2024, Prof. Thomsen once again took to the stage, this time with **Sir Jeremy Farrar** (Chief Scientist, WHO). Feedback from the attendees highlighted that they had learned a lot and, just as importantly, they had **established networks and contacts to help form the ‘essential partnerships’ described throughout the meeting.**

On reflecting on his own learnings from the Summit, Prof. Thomsen drew attention to the need to **ensure we take scientific breakthroughs and drive them to translation and implementation in an equitable manner.** He also made reference to the knowledge that we are now living in planetary overshoot areas and that, while inspiration can be taken from ozone, that was a simple vertical, other overshoot areas are more complex. Similarly, **while response to IDs can be smart and (now) quick, chronic NCDs are multifactorial and intervention will require partnerships.**

Sir Jeremy **highlighted the convergence of IDs and NCDs and multimorbidity.** Indeed, COVID was a very different disease symptomatically, with patient outcomes depending on comorbidities.

Prof. Thomsen also turned to communication: throughout the Summit it was repeated that people do not understand the benefits of action. **If we can explain the benefits clearly, we are more likely to get support and adoption.** The challenge, as raised by Sir Jeremy, is that **science/innovation and politics are diverging.** If there is too much ‘we the scientists’ versus ‘normal people’, there will be backlash resulting from fear. Sir Jeremy highlighted that **trust in international organisations is falling** but trust in companies remains steady. Inclusive development and reversing the divergence between international organisations and the public are vital.

To conclude, Sir Jeremy highlighted the **steady foundational work of basic science.** mRNA vaccines were discussed and celebrated during the Summit, but they were not developed in a year. The Nobel Prize was awarded for foundational work done in the 1980s; thus, long-term investment in science is crucial. **If we don’t invest today, we won’t have those technologies and the basic understanding to solve the problems of the future.**



Appendices

1. Organisations represented

- African Population and Health Research Center
- Alliance for a Green Revolution in Africa
- Amref International University
- Axilor Ventures, Pratiksha Trust
- Bill & Melinda Gates Foundation
- BioInnovation Institute
- BioNTech UK Ltd.
- Bosch Health Campus
- Boston Children's Hospital
- Caixa Research Institute
- Cape Western Reserve University
- CAPRISA
- CARB-X
- Centre for Childhood Health
- Centre for Epidemic Response and Innovation, Stellenbosch University
- CEPI
- CGIAR
- CIFAR
- CIMMYT
- Clim-Eat
- Congolese Foundation for Medical Research
- Cornell University
- Courant Institute of Mathematical Sciences
- Danish Chamber of Commerce
- Danish Ministry of Finance
- Delta40 Venture Studio
- Drugs for Neglected Disease Initiative
- DTU Technical University of Denmark
- European Commission
- Gates Ventures
- Gavi, the Vaccine Alliance
- Gehl
- German Federal Agency for Disruptive Innovation (SPRIND)
- Google Research
- Grand Challenges Canada
- Hanoi Medical University
- Harvard University
- Helen Keller International
- Helvetas Swiss Intercooperation
- Hong Kong Jockey Club Charities Trust
- ICARS
- ICRISAT
- Imperial College London
- Independent Entrepreneurs
- Innovation Fund Denmark
- Institut Pasteur of Dakar
- InterAcademy Partnership
- "La Caixa" Foundation
- LIFE
- London School of Hygiene & Tropical Medicine
- Makerere University
- Microsoft Corp.
- Ministry of Foreign Affairs of Denmark
- Nairobi City County
- National Institutes of Health Fogarty International Center
- Nepal Health Research Council
- Nexleaf Analytics
- Novo Nordisk Foundation Center for Biosustainability
- Novo Nordisk Foundation Initiative for Vaccines and Immunity
- Novo Holdings
- Novo Nordisk A/S
- Novo Nordisk Foundation
- Novonesis
- Philanthropy Asia Alliance
- Pioneer Centre for Artificial Intelligence
- Rigshospitalet
- Science for Africa Foundation
- SickKids Centre for Global Child Health
- Skip Foundation
- Social Alpha
- South African Medical Research Council
- Stanford University
- Statens Serum Institut
- Steno Diabetes Center Zealand
- Telethon Kids Institute
- The Danish Health Authority
- The Lancet
- The Rockefeller Foundation
- Time BioVentures
- Tony Blair Institute for Global Change
- United Nations Institute for Training and Research
- Universidad Peruana Cayetano Heredia
- University of Cape Town
- University of Copenhagen
- University of Manitoba
- University of Milano
- University of Oslo
- University of Pretoria
- University of the Witwatersrand
- Wellcome Trust
- World Diabetes Foundation
- World Food Programme
- Wyss Institute
- Yale University

2. Special announcement session

Before the start of the Summit itself, a short session was dedicated to a special announcement: a first-of-its-kind, **tripartite agreement between Novo Nordisk Foundation, Wellcome and the Bill & Melinda Gates Foundation**.

The partnership is focused on supporting science and innovation to advance solutions that are accessible and affordable to LMICs. **The 3-year initiative will see each organisation commit USD 100 million** (for a total of USD 300 million). Initial funding will support solutions to address the health impacts of climate change; ID and AMR; and greater understanding of the interplay between nutrition, immunity, disease and developmental outcomes. The new funding will also include direct support for researchers and institutions based in LMICs, including resources to advance locally relevant research agendas, strengthen R&D capacities, and scale equitable access to existing tools and technologies.

Prof. Mads Krosgaard Thomsen, CEO of the Novo Nordisk Foundation, highlighted the rationale behind this agreement: **no single technology or solution will solve the challenges we face, and a multidisciplinary approach is essential**. Novo Nordisk Foundation, Wellcome and the Bill & Melinda Gates Foundation have complementary skills and experience. Beyond this, they will now be able to speak with one voice and drive necessary change. **Dr John-Arne Røttingen**, CEO of Wellcome Trust, reinforced this by highlighting that, **while advances are driven by science-based solutions, partnerships are the foundation**. For example, breaking the silos of agriculture, nutrition and health has tremendous transformative ‘food as medicine’ potential. **Mr Bill Gates** echoed this by celebrating the results in global health since the turn of the century: halving the number of deaths of children aged under 5 years from 10 million to 5 million globally is “one of the greatest achievements of mankind”. To go from 5 million to zero requires an understanding of why children do not develop physically and mentally, but **the market alone doesn’t help the poorest and most vulnerable**. Mr Gates called the tripartite agreement “our first big announcement” but made it clear he “hope[s] it won’t be our last”.

Dr Ismahane Elouafi, Executive Managing Director of CGIAR, further outlined the importance of innovation in the agriculture space, given the very urgent mission and need for agriculture to become a carbon sink, not a producer. Given agriculture employs half the world’s population in one form or another and is concentrated in the Global South, **access to any technological solutions (particularly in Africa and Southeast Asia) will be crucial**.

The interplay between climate, agriculture, sustainability and human health (both IDs and NCDs; as explored during the Summit’s sessions) was briefly discussed, including highlighting the **impact of climate-driven disease in LMICs** by **Dr Catherine Kyobutungi**, Executive Director of the APHRC.

The panel was reassured that the **opportunities are immense** given how powerful the tools at our disposal have become, predominantly in high-income countries. In particular, Mr Gates focused on the microbiome: we are now in a position to sequence the microbiome across thousands of patients to truly understand its importance and mechanisms, and those insights are already leading to benefits. Mr Gates believes the microbiome will be the key to solving under- and overnutrition. Other examples include the opportunities offered by big data and generative AI; while we stand at a unique point in time with these capabilities and opportunity, scale-up is not free. We **need to be able to ensure potential solutions are translated through to global impact**. Philanthropy can play a role, but we need to address market and government failures.



3. Novo Nordisk Foundation open call

Announced as part of the Global Science Summit, a funding call tied to the programme is open with applications due 8th August 2024.

Purpose

The Global Science Summit Programme aims to explore the intersection between major global health and sustainability challenges through fostering scientific discoveries that address the combined impact of NCDs, IDs, climate change, and related enabling technologies.

The purpose of the Global Science Summit Programme 2024 is to catalyse science-based solutions by supporting international interdisciplinary collaborations that address intersectional challenges between at least two of the following areas:

- Climate change
- Non-communicable disease, in particular cardiometabolic diseases
- Infectious diseases
- Related enabling technologies.

The collaboration should provide more than just a compounding of individual skills, but rather strive to synergistically combine perspectives, theories, data, experimental approaches and/or concepts across fields to generate novel results addressing the above-mentioned global challenges.

Eligibility

The programme supports collaborations between 2 and 3 research groups (the main applicant plus 1 or 2 co-applicants). Proposals must demonstrate interdisciplinarity and international engagement by including co-applicants from different disciplines and potentially from different nations. Disciplines does not refer to the education or formal position of the applicants, but rather their ongoing work expertise.

Guiding principles on eligibility include:

- The Global Science Summit Programme seeks to actively engage researchers from all over the world, but applicants must be established investigators and must be employed at the administrating institution registered in the proposal for the duration of the project.

- The administrating institution/organisation must be able to accept and manage the potential grant. Projects can be anchored at any type of non-profit research organisation, including universities, hospitals, and other not-for profit organisations.
- Collaboration with researchers in non-academic sectors is allowed, however industrial partner(s) cannot receive direct funding through this programme.

The principal investigator (PI), who leads the project and submits the proposal, is limited to one submission per call as the main applicant. However, co-applicants may participate in multiple proposals, and a main applicant in one proposal may serve as a co-applicant or collaborator in other proposals.

Funding

A total of up to DKK 50 million (approximately USD 7.2 million) is expected to be allocated to proposals submitted to this call. The number of proposals supported will depend on the quality and expected budget.

Each project should not exceed a budget of DKK 7 million (approximately USD 1 million) and is expected to have a duration of 1–3 years.

Application process

The application must be completed in English and submitted using the Novo Nordisk Foundation's online application and grant management system, NORMA.

Application guidelines and the submission portal can be found at:

<https://novonordiskfonden.dk/en/grant/global-science-summit-programme-2024/>

Contact: NNF-GSS@novo.dk

4. Meeting programme

Time	Monday, 6 May
08:00-11:30	Arrival and optional networking activity
11:30-13:30	Lunch
12:30-13:00	Special announcement
13:30-15:00	<p>Opening speech</p> <ul style="list-style-type: none"> • Mr Lars Rebien Sørensen, Chair of the Board, Novo Nordisk Foundation <p>Keynote speakers</p> <ul style="list-style-type: none"> • Mr Bill Gates, Co-Chair, Bill & Melinda Gates Foundation • Dr Tedros Adhanom Ghebreyesus, Director-General, World Health Organization • Dr Catherine Kyobutungi, Executive Director, African Population and Health Research Center • Prof. Mads Krogsgaard Thomsen, Chief Executive Officer, Novo Nordisk Foundation <p>Fireside chat with keynote speakers</p>
15:00-15:30	Break
15:30-17:30	<p>Connecting health and sustainability in time of polycrisis: transcending borders to create new scientific breakthroughs</p> <p>Keynote speakers</p> <ul style="list-style-type: none"> • Dr John-Arne Røttingen, Chief Executive Officer, Wellcome Trust <p>Panellists</p> <ul style="list-style-type: none"> • Dr John-Arne Røttingen, Chief Executive Officer, Wellcome Trust • Prof. Flemming Konradsen, Senior Vice President, Social & Humanitarian, Novo Nordisk Foundation • Dr Alaa Murabit, Director Program Advocacy and Communications, Health, Bill & Melinda Gates Foundation • Prof. Krishnaswamy VijayRaghavan, Former Principal Scientific Adviser to the Government of India • Dr Lynda Stuart, Executive Director, Institute for Protein Design
17:30-19:30	Drinks, canapés and networking
19:30-23:00	Dinner

Time **Tuesday, 7 May****09:00-10:20** **How climate change affects non-communicable diseases: challenges and mitigation strategies****Keynote speakers**

- Prof. Walter C. Willett, Harvard Chan School of Public Health

Panellists

- Prof. Walter C. Willett, Harvard Chan School of Public Health
- Dr Bente Mikkelsen, Director, Noncommunicable Diseases, Rehabilitation and Disability, World Health Organization
- Dr Poornima Prabhakaran, Director, Centre for Health Analytics Research and Trends, Trivedi School of Biosciences, Ashoka University and Centre for Chronic Disease Control
- Dr Rachel Nugent, Senior Technical Advisor, Center for Global Noncommunicable Diseases, RTI International and University of Washington Department of Global Health

10:20-10:45 **Break****10:45-12:00** **Climate change: the impact on infectious diseases and the food system: What is the scale and how do we build resilience?****Keynote speakers**

- Prof. Katherine Richardson, University of Copenhagen
- Sir John Bell, President, Ellison Institute of Technology and Co-CEO, EIT Global

Panellists

- Sir John Bell, President, Ellison Institute of Technology and Co-CEO, EIT Global
- Prof. Katherine Richardson, University of Copenhagen
- Dr Maria Neira, Director Environment, Climate Change and Health, World Health Organization
- Prof. Jeremy Hess, University of Washington
- Prof. Jan C. Semenza, Project Manager, Section of Sustainable Health, Umeå University
- Ms Fahreen Chudasama, Director of Development Cooperation, AGRA

12:00-13:00 **Lunch****13:00-14:15** **Cities at the intersection of climate change, NCDs, infectious diseases and food systems****Keynote speaker**

- H.E. Sakaja Arthur Johnson, Governor, Nairobi City County

Panellists

- Dr Corinna Hawkes, Director, Agrifood Systems and Food Safety, Food and Agriculture Organization
- Dr Tajudeen Raji, Ag. Deputy Director General, Africa CDC
- Clinical Prof. Tolullah Oni, University of Cambridge and CEO, UrbanBetter
- Mr Augustin Flory, Managing Director, Innovative Partnerships and Development Finance, GAVI

14:15-14:30 Break

14:30-15:45 **Technology to push boundaries and facilitate scientific breakthroughs**

Keynote speaker

- Dr Lynda Stuart, Executive Director, Institute for Protein Design

Panellists

- Dr Lynda Stuart, Executive Director, Institute for Protein Design
- Prof. Peter Krogstrup Jeppesen, Chief Executive Officer, NQCP and Quantum Foundry
- Dr Corinna Cortes, Vice President, Google Research
- Dr Ismahane Elouafi, Executive Managing Director, CGIAR

15:45-16:15 Break

16:15-17:30 **Translation and financial enablers for greater impact**

Keynote speakers

- Dr Cheryl Martin, Founder, Harwich Partners & former ARPA-E Director
- Mr Jeppe Christiansen, Chief Executive Officer, Maj Invest

Panellists

- Dr Cheryl Martin, Founder, Harwich Partners & former ARPA-E Director
- Mr Mads Nipper, Chief Executive Officer, Ørsted
- Ms Gina Domanig, Managing Partner, Emerald Technology Ventures
- Dr Johannes Fruehauf, Executive Director, Biolabs/LabCentral
- Dr Lars Frølund, Lecturer, Massachusetts Institute of Technology and Board Member, European Innovation Council

17:30-18:00 **Concluding remarks**

- Sir Jeremy Farrar, Chief Scientist, World Health Organization
- Prof. Mads Krogsgaard Thomsen, Chief Executive Officer, Novo Nordisk Foundation

18:00-23:00 **Closing dinner at Kronborg Castle**

2024 Novo Nordisk Foundation
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Science
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