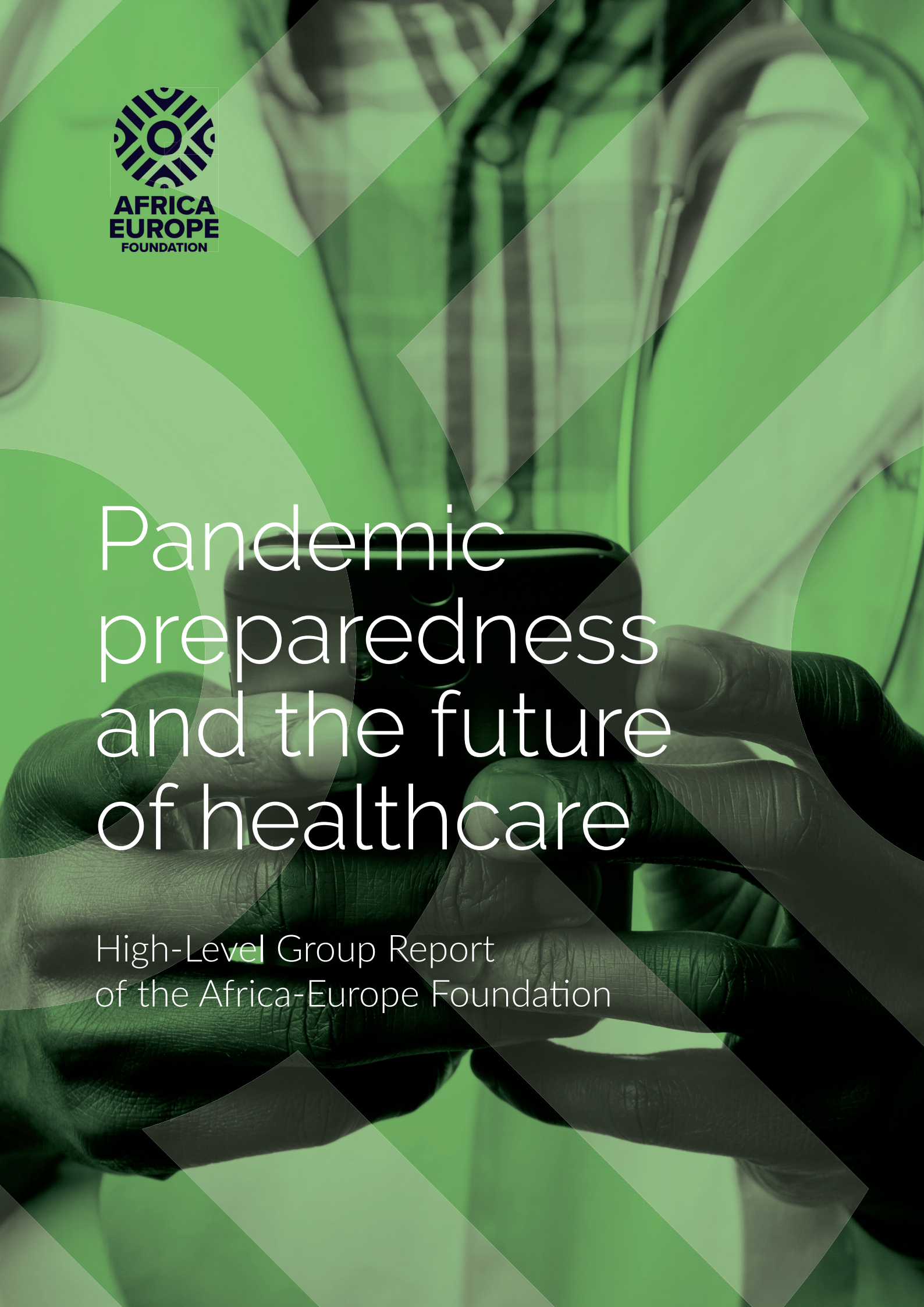

AFRICA EUROPE FOUNDATION

Pandemic preparedness and the future of healthcare

High-Level Group Report of the Africa-Europe Foundation

Pandemic preparedness and the future of healthcare

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About the Africa-Europe Foundation

The Africa-Europe Foundation is a platform to inspire and catalyse action in the fight against Climate Change and Inequality within a strengthened partnership between Africa and Europe – two continents with a shared future. The Foundation's work is orientated by the "High-Level Group of Personalities" composed of high-level experts, much-respected experienced leaders, and co-chairs of Africa-Europe Strategy Groups on themes of cooperation critical in both the COVID-19 context and in the face of the ongoing climate emergency.

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Executive overview

2020 was supposed to be the year a rejuvenated Africa-Europe partnership took pride of place on the world stage. As the COVID-19 pandemic wreaked havoc across every part of the world, this partnership took a back seat. In addition, efforts to contain the virus and its economic and social aftershocks have exacerbated existing inequalities, tested global partnerships, and undermined trust in multilateral cooperation.

The global pandemic is far from over. While countries in Europe are opening up their societies and economies, many African countries struggle to contain the virus as new, more infectious variants emerge. This is driven by astounding vaccine inequities as G20 countries continue to monopolise vaccine supplies. Leaders may have said that "nobody is safe until everyone is safe" but not enough have acted on their promises.

Now is the time to change course. We aim to demonstrate that a rejuvenated partnership between Africa and Europe is not just political rhetoric, but is rooted in a mutual desire to work together towards a fairer, more stable and more equitable future for the citizens of both continents.

Tackling the pandemic is a critical first test of the Africa-Europe partnership's capacity to generate the political will and trust to mobilise resources, and serves as an indicator of how it will stand up to an even greater test: the climate crisis. Even as the climate crisis is today causing devastation in the form of floods, wildfires, desertification, and food insecurity, all of which strain health systems, the window to avoid greater ecological destabilisation is rapidly closing. And with that devastation will come further risks to global health security, including the fight against infectious diseases. As with the pandemic, prevention and preparation will be far less costly – in economic, social, and environmental terms – than responding when it's too late.

The climate crisis, and the urgency of addressing it, is a health imperative. The health of the population rests firmly on the well-being of the planet and in maintaining sustainable planetary boundaries.

It is against this unprecedented global context that the High-Level Group Report has been prepared. It examines the role Africa and Europe can, and will have to, play in reshaping the international agenda to work at the nexus of health, climate and development, and to tackle the crises of today in a way that guards against the challenges of tomorrow.

The flagship report of the Africa-Europe Foundation (AEF), developed under the guidance of the AEF's "High-Level Group of Personalities," builds on expert consultations, dialogues and the input of the Africa-Europe Foundation's many distinguished partners, including:

- The Foundation's multi-stakeholder Strategy Groups comprising think tanks, academics, civil society networks and private sector partners based across Africa and Europe;
- Young leaders and international policymakers consulted through the AEF "Talking Africa-Europe" series, the new Debating Africa platform and the first AEF Forum (30 June to 2 July 2021).
- The AEF High-Level Group of Personalities on "pandemic preparedness and the future of healthcare" (4 June 2021).

In preparation for the EU-Africa Summit in 2022, this report lays out an agenda for immediate and long-term cooperation between the two continents. It is based on the premise that the steps needed to end the current pandemic must lay the groundwork to prevent future global health crises and provide the foundations for tackling challenges faced as a result of climate change.

The COVID-19 pandemic has shown us that investing in partnerships that will allow us to collectively tackle the common agendas created by climate change and global health security are no longer a matter of charity or "development" but are central to the security and prosperity of all our people, our economies, and the planet on which we all depend.

The Africa-Europe partnership presents us with a unique opportunity to respond to the wake-up call that COVID-19 has given us by acting with urgency and mustering the necessary resources and political will so that no health threat ever devastates the planet in the same way.

This report is structured around three pillars for the Africa-Europe partnership:

i. Finance, manufacturing, and supply chains

Global health governance should be designed to prevent, rather than respond to, crises. But in order to have the capacity to prevent and respond to crises, the inequities in global health need to be addressed, and health systems in developing countries, particularly in Africa, need to be strengthened. In

particular, manufacturing capacity for vaccines, pharmaceuticals, and medical equipment needs to be developed in Africa, with robust supply chains that boost access to prevention and treatment across the continent. Africa has begun establishing vaccine production hubs across the continent, both with Europe and other partners, and supporting and scaling up these hubs will not only help reach the end goal of health sovereignty for both Africa and Europe, but will also strengthen Africa's hand in global health governance. To fund this, the High-Level Group recommends that the AU-EU summit commission the International Monetary Fund (IMF), the World Bank and development finance institutions to explore mechanisms for innovative financing, including developing specific Health Social Impact Bonds, to mobilise resources for investment in health systems including pandemic preparedness.

ii. Health and the climate-development nexus

Resilient health systems will become even more important as the increasingly severe effects of the climate crisis are felt globally, even as the current impacts of climate change, including heat waves, droughts, floods, and desertification, put a strain on health systems, disrupt supply chains, and increase food insecurity and malnutrition which leads to the forced displacement of large numbers of people. Although examples of international solidarity have been rather thin on the ground during the pandemic, the rapid mobilisation of resources by national governments and supranational institutions is nonetheless unprecedented, and the same political will – with a more internationalist approach – will need to be found to address the climate crisis. The High-Level Group recommends treating the climate crisis as a public health crisis, and maintaining a focus on the nexus of climate and economic development through an active, innovative, and sustainable programme of work. This includes the recommendation for a political declaration at the AU-EU Summit committing to roll out clean cooking solutions across Africa as a critical public health measure, cutting black carbon emissions and deforestation, and reducing air pollution. The Group also calls on high-income countries to use COP26 to hit the financing targets pledged in 2009 to support green transition in the developing world.

iii. Digital and artificial intelligence in healthcare

Key to building the resilient health systems of tomorrow are digital health solutions and artificial intelligence . Artificial intelligence is already reshaping the health sector, from diagnosing patients to discovering new drugs and foresight modelling and analysis. Its use, along with other digital healthcare solutions, could have a particularly transformative effect in Africa in filling the shortfall in healthcare workers on the continent. The High-Level Group suggests the creation of a comprehensive Foresight Observatory on Health Workforces. Such an observatory would monitor data and trends in climate and health to predict the needs of future health workforces around the world, looking beyond the current definitions of healthcare professionals to also include manufacturing needs, data gaps, and AI engineers when making its recommendations to policymakers. Alongside the Observatory, the Group recommends the creation of a Health Data Space for Africa, in the model of the European Health Data Space, to promote a more robust exchange and access to different types of health data (electronic health records, genomics data, data from patient registries, etc.), not only to support healthcare delivery but also for health research and policy making purposes.

In summary, by addressing these three pillars for partnership, the High-Level Group report demonstrates that investment in global partnerships, targeted in particular at addressing power imbalances, is the only way to address the global challenges of climate change and public health insecurity. The Africa-Europe partnership must take the opportunity offered by COP26, the EU-Africa Summit, and COP27 to become a global leader in equitable intercontinental relationships that is capable of mobilising the resources and political courage to face the unprecedented tests humanity is now tasked with.

Areas for Action for the Africa-Europe Partnership

A political and international focus on climate and health is a unique chance for Africa and Europe to build a partnership aimed at equitable economic development. Given the centrality of both of these areas to the future of both continents, a successful partnership would help address growing issues such as job creation and youth unemployment, as well as supporting a just Fourth Industrial Revolution.

Ending the pandemic and pursuing global health governance

A rejuvenated partnership of equals

- The EU-Africa Summit should call for Africa and Europe to leverage their partnership to build a new paradigm for public health, with a focus on moving towards interdependent sovereignty

- Africa and Europe should announce a new diplomatic alliance at the EU Africa Summit to push for action and ambitious commitments from world leaders at key multilateral moments, including the World Health Assembly, COP 27 and at the UN General Assembly. The first objective should be to advocate $15 billion per annum for pandemic prevention and preparedness, in line with the recommendations made by the Independent Panel for Pandemic Preparedness and Response (IPPPR) and the G20 High-Level Independent Panel.

- The EU-Africa Summit should pledge to strengthen the Africa-Europe partnership by reiterating and reinforcing the commitments made by African governments on healthcare expenditure under the Abuja Declaration to spend 15% of domestic budgets on healthcare, to take the next step to universal health coverage.

Ending the COVID-19 pandemic

- All European and African countries should endorse the WHO target to ensure that 70% of populations in all age and income groups are fully vaccinated by September 2022.

- EU countries should put in place plans – through COVAX - to deploy all unused COVID vaccines in low- and middle-income countries as soon as possible.

- The EU should support the proposal from India and South Africa, backed by the African Union, the US, China, and the WHO, for a temporary TRIPS waiver on intellectual property at the WTO to allow low- and middle-income countries to produce their own COVID-19 vaccines, tests, and treatments.

- African countries should update readiness plans for vaccine deployment and development actors should support eligible countries to seek Gavi funding for COVID-19 vaccine rollout.

- The EU should collaborate with the Africa CDC to facilitate an urgently needed scale up of freight management solutions and ultra-cold chain storage facilities in Africa.

A new model of global health governance

- African and European countries should pursue accelerated mRNA vaccine production in Africa by providing support to experts from both continents to work together at WHO hubs and other manufacturing centres, by building greater healthcare research capacity in Africa, and by supporting the use of this technology against malaria, tuberculosis, HIV and other diseases.

- The EU and African countries should commit to increasing the number of vaccines, medical equipment, and pharmaceutical hubs in Africa to support interdependent health sovereignty for both continents.

- European countries should commit to “recycling” their share of the recent $650 billion Special Drawing Rights allocation to African countries (amounting to a total of $169.6 billion).

- African countries should implement an intracontinental qualification standardisation system, similar to the mutual recognition of qualifications used in the EU, to allow freer international movement in Africa for healthcare professionals, and reduce brain drain of healthcare professionals from Africa to Europe.

Building a holistic approach to health and climate

- European and African leaders at COP26 should publish a political declaration which recognises the role that the climate crisis has on global health beyond zoonoses such as COVID-19, including food insecurity as a public health issue, and build climate-resilient health systems. This should outline how the partnership will harness the health benefits of climate action in both Africa and Europe.

- The EU-Africa Summit should support the Great Green Wall Accelerator and commit to securing the remaining funds to ensure the project achieves its 2030 goals.

- The EU-Africa Summit should support the Rural Resilience Programme in order to increase

the allocation of climate finance reaching small-scale food producers: with the aim of building shorter, more robust supply chains for food; addressing food insecurity and undernourishment; increasing employment; and promoting biodiversity.

- The EU-Africa Summit should endorse a political declaration on clean-cooking solutions as a critical element of improving health (particularly of women); fighting deforestation; and cutting black carbon pollution. This should include funding and impact targets.

- African and European countries should evaluate the resilience and preparedness of their health systems to ensure adequate planning for climate change adaptation, through Vulnerability and Adaptation Assessments, as promoted by the WHO's Health and Climate Change toolkit.

- African and European countries should commit to investment in cleaner urban mass transport systems, as a public health measure to reduce air pollution and its impact on health systems, as well as emission levels.

- The EU-Africa Summit should encourage city and municipal leadership (across Africa and Europe) to play a transformative role in reducing the air pollution levels in both continents.

- African and European countries should commit to supporting the development of inland water transport in Africa, both to increase access to healthcare for hard-to-reach and rural populations, and to provide a more climate-friendly transport mode for integrating supply chains.

- European and African countries should expand the 'Low-carbon healthcare in the Mediterranean' project to include North African Mediterranean countries.

Building the health systems of the future

- European and African countries should support the creation of the AEF Health Workforce Foresight Observatory to monitor the healthcare workers needed around the world to deal with current health problems; predict the specialisms needed for the future given evolving health trends, and advise on the training and numbers of healthcare workers needed and seek endorsement from the G20. The Africa-Europe Foundation has identified this as a priority for the partnership to become a leader in global health governance, and will work with partners such as the WHO to explore the next steps for the initiative.

- The EU-Africa Summit should support the creation of a Health Data Space for Africa, modelled on the European Health Data Space, to support healthcare delivery and health research and policy making purposes and to promote a more robust exchange and access to different types of health data.

- African countries should put in place a continental strategy on AI for Health drawing on lessons learnt from Europe's own Coordinated Plan.

- The EU should support the 3 Million African Genomes Project, in order to have greater representation of African genetic data in global health databases for research on genetic disorders and to improve the efficacy of medical equipment.

- The EU-Africa Summit should ensure city and municipal leaders are effectively engaged in the agenda-setting of the Summit and have a forum to share good practices on effective sustainable urban development and public health management; deepen city-to-city cooperation across Africa and Europe building on the existing Mayors Dialogue on Growth and Solidarity.

- African leaders should support President Ramaphosa's call for an African AI forum, to generate and proliferate new ideas in the field, and tap into the digital literacy of the continent's youth.

- At the EU-Africa Summit, European and African countries should commit to implementing the proposals of the Lisbon Manifesto to support Earth Observation capacity in both continents for delivery of new and better data for health systems and climate change monitoring.

- The EU-Africa Summit should urge the IMF, the World Bank and development finance institutions to explore mechanisms for innovative financing, including health social bonds to mobilise resources for investment in resilient health systems and pandemic preparedness.

SECTION 01

Sovereignty in Health: Finance, Manufacturing, and Supply Chains

The devastating second wave of the pandemic in India at the start of 2021, combined with the continued difficulties faced by countries in the Global South, particularly in Africa, in obtaining vaccines, has underlined the importance of shorter, more robust, and more diverse supply chains in the health sector. Even more crucially, it underlined the need to ensure manufacturing capacity for vaccines, other pharmaceutical products, and medical equipment across the African continent.

At the meeting on 4 June 2021, the High-Level Group agreed that the international efforts for equitable vaccine distribution had been largely disappointing, and with currently only 5.6% of Africa's population having been vaccinated, the WHO target of 40% coverage by the end of 2021 is almost certainly out of reach. COVAX has been hampered by a lack of necessary funding, G20 countries (including EU member states) monopolising supply, and an over-reliance on the production capabilities of the Serum Institute of India (SII) making the scheme vulnerable to India's export ban. Additionally, some G20 countries have abused the spirit of the model – in March 2021, the UK received more vaccine doses than Botswana, Rwanda, Togo, and Libya combined.

Global leaders at the Global COVID-19 Summit hosted by the US reiterated their commitment to providing doses to COVAX, led by US President Biden pledging 500 million doses for early 2022, as well as $383 million in risk insurance to facilitate delivery. India is also set to resume exporting vaccine doses, prioritising COVAX and its neighbouring countries. However, so far this year fewer than 15% of pledges have materialised into doses, and as countries discuss booster jabs for their vaccinated citizens and begin vaccine programmes for younger children, continued vaccine inequity appears likely to remain.

Short-term access to vaccines for Africa is crucial if the world is to fully exit the current pandemic, and the AEF supports the proposal from South Africa and India for a waiver of intellectual property rights under the agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) at the WTO. Backed by the WHO, the IPPPR, the African Union, NGOs and global health experts, the waiver would stimulate the production of vaccines and make COVID-19 vaccines much more accessible and sustainable in the future.

Returning to the status quo is not an option

The High-Level Group recognise that whilst ending the current pandemic is the priority for all governments and institutions, simply returning to the pre-pandemic status quo is not a viable option. Amidst the existing pressing issues in the health systems of both continents, the pandemic revealed bottlenecks in both African and European supply chains for Personal Protective Equipment (PPE), surgical masks, and even hand sanitiser. At the meeting of 4 June 2021, the group called on Africa and Europe to leverage their partnership to build a new paradigm for public health, with a focus on moving towards interdependent sovereignty. Discussions around increasing self-reliance for healthcare are not new, particularly in Africa's case, but critically, the pandemic has created political backing for this approach.

It's not as simple as donate and done

For Africa in particular, issues with access to vaccines were compounded by difficulties with delivery and rollout. Vaccines received through donations have often been delivered in small doses, with a varied type and shelf life, meaning the African Centres for Disease Control (CDC) and national governments struggle to plan rollouts . Mechanisms such as the African Vaccine Acquisition Task Team (AVATT) have allowed the African Union to give access to 220 million doses of the single-dose Johnson & Johnson vaccine, which many countries are using to vaccinate rural communities and other hard–to-reach populations. However, organising a more regular supply is still crucial if Africa is to rapidly vaccinate its population. Aside from the workforce required for mass vaccination and the IT systems needed to monitor dose distribution to coordinate second jabs, vaccines using mRNA technology, such as Pfizer's, require ultra-cold chain storage, which many countries in Africa do not possess. Following further pledges of Pfizer vaccines, Gavi aims to support the distribution of these doses to 50 developing nations through $25 million investment in freezers that can store mRNA vaccines.

Investing in specific production capacity for African-made vaccines could create numerous positive externalities beyond the immediate benefits – intracontinental trade in key ingredients, storage facilities, and employment opportunities stand to gain from setting up an African vaccination pipeline – and greater vaccine export capacity strengthens Africa's hand in global health governance , which is a key part of creating a more equitable Africa-Europe partnership. The AEF Strategy Group on Health has identified manufacturing capacity as a key priority, and will work to position itself as a convenor to link stakeholders in the healthcare ecosystem around the issue of increasing this capacity to ensure a more robust and steady supply of vaccines and other medical equipment in Africa. We see the global recognition of the need for greater vaccine manufacturing capacity in Africa as an opportunity that cannot be wasted, and scale up this question to look at greater financing for African healthcare systems as a whole – looking at the new methods of financing developed by multinational financial institutions such as the EIB and the World Bank.

"Investing in specific production capacity for African-made vaccines could create numerous positive externalities beyond the immediate benefits – intracontinental trade in key ingredients, storage facilities, and employment opportunities stand to gain from setting up an African vaccination pipeline – and greater vaccine export capacity strengthens Africa's hand in global health governance."

The High-Level Group propose that funding for such a new model of healthcare comes from innovative financing mechanisms, as well as through access to domestic funds. The IMF's international reserve asset (Special Drawing Rights) was expanded to $650 billion to help countries cope with the pandemic, but with just $33 billion allotted to Africa this is far from the $285 billion financing gap estimated by the IMF. EU countries should commit to recycle all of their allocations to African countries. Alongside international finance, prioritisation should be on creating the right regulatory environment to support private sector investment and removing financial disincentives to working in Africa, as well as unlocking sources such as Africa's pension and insurance funds, which hold around $220 billion.

Vaccine manufacturing capacity is a medium- to long-term target for Africa's health systems. Aside from the necessary pharmaceutical and hardware production centres, considerable investment is needed in research and development capacity on the continent. The Africa-Europe partnership has begun work on this, with the European Commission agreeing at the 'Compact with Africa' Summit to provide funds to support BioNTech manufacturing mRNA vaccines in Dakar and Kigali. Whilst the mRNA technology is the same as is used in the Pfizer/BioNTech COVID-19 vaccine, the facilities will focus primarily on malaria and tuberculosis, although COVID vaccines will be produced at the Dakar site in the interim. The focus on malaria and tuberculosis, illnesses that primarily affect Africa, underpin the view that foreign private and public sector actors are more willing to invest in vaccine production in Africa for diseases more prevalent on the continent, due to the guaranteed market. Indeed, as the WHO recommends widespread use of the RTS,S malaria vaccine, the time has never been more right for Africa to produce its own vaccines. While this is not a long-term growth strategy for Africa's pharmaceutical sector, it is perhaps an avenue to demonstrate the possibilities that research and production capacity could bring about. These hubs are not the first on the continent. The WHO, COVAX partners, and a South African consortium announced plans for a mRNA technology transfer hub. However, lack of participation from the larger pharmaceutical players has meant any progress on turning it into a vaccine hub has not been as fast as initially hoped. The hub will focus on attempting to replicate the Moderna vaccine, as the company has said it will not enforce its patents, but nor is it sharing its technologies as was proposed by the IPPPR.

Aside from the research and development needed to produce vaccines, the other main obstacle for vaccine production is scale. Vaccines are produced in large quantities in order to keep costs as low as possible, which requires large markets. Africa is often spoken about as one market, but the reality is that the markets of the continent's 54 countries are distinct and separated – although the continent boasts a similar population to China and India, both vaccine production powerhouses, the translation of these populations into markets does not match up. However, this could soon change, with the operationalisation of the African Medicines Agency (AMA) following the fifteenth deposition of the instrument of ratification. The AMA will increase the attractiveness of the African market for the pharma industry and support regulatory convergence across the continent, improving access to medicines.

"The AEF Strategy Group on Health has identified manufacturing capacity as a key priority, and will work to position itself as a convenor to link stakeholders in the healthcare ecosystem around the issue of increasing this capacity to ensure a more robust and steady supply of vaccines and other medical equipment in Africa."

A whole-of-Africa approach to vaccine production in Africa is the only way production can be scaled to the necessary degree, and Africa's institutions have a key role in designing this. At the meeting on 4 June 2021, the High-Level Group highlighted the role that the Africa CDC played in leading

Health Impact Bonds

Pre-pandemic, arguments that healthcare is an economic investment rather than a cost have failed to get traction beyond Ministries of Health. There is now a common consensus that there will be no economic recovery without a recovery of public health and health systems. Investments towards universal healthcare and more inclusive health systems are critical to withstand the current and future pandemics, as well as build more inclusive and equitable health systems.

Traditionally, international organisations such as Gavi and the Global Fund have provided financing following vertical models, dedicating funds to fight specific health conditions, with little to no local project ownership, and leading to little sustainability and low long-term returns.

Now, Social Impact Bonds are gaining traction on the global stage as a sustainable financing tool. In Africa, they benefit from noteworthy political traction: Ghana is currently preparing to raise up to $1 billion through bonds, while the African Development Bank, having already launched social bond program in 2017, has recently issued five such bonds, the latest being a SEK2.5 billion ($3 billion) debt instrument to fight COVID-19.

A subset of Social Impact Bonds, Health Impact Bonds would support the development of more resilient and inclusive health systems. They would provide countries with the necessary ownership to ensure the provision of health services on a sustainable basis through the financing of projects as diverse as maternity wards, ambulance services and improved procurement of health products. Financing through Health Impact Bonds could be organised through the law and support the strategic overall planning of health systems, helping countries meet their Abuja Declaration targets of 15% annual budget expenditure in their health sector.

Africa's response to the pandemic, rapidly mapping vaccine manufacturing capacity and mobilising financial investments to develop and expand this capacity, as well as developing tools to support joint procurement, technology transfer and vaccination logistics chains. The Africa CDC, along with the African Union, are now using this experience to design a model for intracontinental vaccine production that neither overburdens nor privileges countries and regions. The AMA, the regional economic communities, and the African Continental Free Trade Area (AfCTFA) in the longer run, can play an important part in creating the large market needed for such a production scale. A continent-wide strategy to build vaccine production capacity may also prove to be a central pillar of the Africa-Europe partnership, with scope for sharing practices from Europe on a vaccine production process that crosses national borders, as well as the Africa CDC's rapid response to cross-border health emergencies, as the EU sets up its new Health Emergency preparedness and Response Authority (HERA).

Hubs for technology transfer and vaccine production are a key milestone on the road to healthcare sovereignty in Africa, even if they will not provide the immediate route out of the pandemic. Vaccine production capacity will be especially key, due to the economic co-benefits it can bring – Africa's vaccine market is today worth $1.3 billion, and expected to grow to approximately $2.4 billion by 2030, yet currently Africa produces only 1% of the vaccines 'consumed' on the continent. The majority of these are 'fill and finish' production, in which packaged vaccine substance is distributed into vials and shipped, meaning production is highly vulnerable to supply chain shocks, and none of the benefits of research and development in producing the vaccine are felt on the continent. However, it does mean that parts of the vaccine supply chain exist on the continent, with the requisite partner confidences and supply networks. With substantial investment, these sites can become full vaccine manufacturing locations. Achieving this would be an extraordinary response, but an extraordinary response is what extraordinary times demand.

SECTION 02

A time for courage: Addressing the climate-health Nexus

"If not now, then when?"

The words of Tedros Adhanom Ghebreyesus, Director-General of the WHO, remind us that exceptional circumstances require an extraordinary response. Climate change, like the COVID-19 pandemic, is still waiting for such an extraordinary response.

The first AEF High-Level Group Report, launched in December 2020, provided the blueprint for an innovative climate alliance as a central pillar for revitalising and strengthening relations between Africa and Europe, and bringing the partnership to the global stage. It underscored the importance of working at the nexus of climate and economic development to identify opportunities to unlock new avenues for economic and social development over the years to come.

Climate change is a system-wide stress test that is already wreaking havoc on communities across Europe and Africa. Living in a world where global temperature rise is at 1.5°C above the pre-industrial average means living in a world with increased adverse health outcomes – dehydration and renal function loss, dermatological malignancies, tropical infections, adverse mental health outcomes, pregnancy complications, allergies, and cardiovascular and pulmonary morbidity and mortality. In addition to this are extreme weather and climate events - heatwaves, floods, droughts, and tropical cyclones – and the IPCC AR6 has noted the mounting evidence both of their frequency and attribution to human influence since the last report in 2014. Extreme events not only bring about and exacerbate adverse health outcomes, but they compound their impacts by placing strain on supply chains, making recovery more difficult and costly. These adverse health outcomes will inevitably disproportionately affect the most vulnerable, including children, older populations, ethnic minorities, poorer communities, and those with underlying health problems. Simply put, a global increase of 1.5°C risks catastrophic harm to health that will be impossible to reverse.

An increased number of extreme climate events, such as heat waves, droughts, and flooding, also threaten human health and well-being, both directly and indirectly, through impaired ecosystem functioning and reduced ecosystem services. The prevalence of non-communicable diseases (NCDs) is also on the rise, causing ill health and accelerating costs to the health sector. Many low- and middle-income countries are undergoing rapid changes associated with developing high rates of NCDs while concomitantly battling high levels of certain communicable diseases, including HIV, tuberculosis, and malaria. This has significant population health, health systems and economic implications for these countries.

Atmospheric concentrations of carbon dioxide currently stand at 414 ppm today, having risen from approximately 280 ppm in preindustrial times. Carbon dioxide remains in the atmosphere for centuries, with about 20% persisting for more than 1000 years. Other short-lived climate pollutants, such as methane and black carbon, also contribute to warming. Current targets and declarations seeking to achieve net-zero emissions are still very much based on technology implementation to remove greenhouse gases from the atmosphere; technologies that do not yet exist.

All of these systems stresses lead to pressure on governments to act, and act decisively. To achieve ambitions in line with the scale of the problem, governments will need to commit to a healthy, green, and just recovery from COVID-19. This includes promoting sustainable, healthy urban design and transport systems, with improved land-use, access to green and blue public space, and priority for walking, cycling and public transport. The World Health Organisation has put forward prescriptions for a healthy, green recovery. At this point in time, national governments are committing trillions of dollars to kick start global economic activity. These investments are essential to safeguard people's livelihoods, and therefore their health. Decisions made now can either "lock in" economic development patterns that could create permanent and escalating damage to the ecological systems that sustain all human health and livelihoods, or, if taken bravely and wisely, can promote a healthier, fairer, and greener world.

For example, scaling up basic services such as hand washing facilities can make a lasting difference to the 40% of households globally that lack access. Antimicrobial-resistant pathogens are widespread

in water and waste and their sound management is needed to prevent their spread back to humans.

Harnessing the health benefits of climate action

Historically, major crises create opportunities for accelerating social, economic, and political change. Much work needs to be done to align climate and health goals – policies must take their lead from the Sustainable Development Goals (SDGs), which highlight the necessity to approach climate action as a public health and anti-poverty issue in order to solve all three of the great global challenges. Improvements in both healthcare provision and general public health can only be safeguarded by system resilience, leadership in health management, collaboration and reduction of inequalities. Advances in these areas are needed to bridge the gap between the issues that are faced now and the transformative change required for tomorrow.

The negative effects of climate change on human health are well documented and include increased illnesses and deaths related to heat-related sickness during heat waves; increased mortality and morbidity related to air-pollution; vector-borne diseases such as malaria; water borne-diseases disproportionately affecting poorer communities with poor water supply and sanitation; and food-borne diseases and food insecurity-related health outcomes such as malnutrition due to droughts and decrease in food supply. Heat waves are the most known effect of climate change. These have been associated with 15,000 excess deaths in all-cause mortality in France during their August 2003 heat wave.

The global health community, time and time again, has urged governments to recognise the fierce urgency of this turning point in time and the necessity for action to protect citizens from runaway climate change impacts on the social and environmental determinants of health. Governments need to prioritise interventions that bring about health, social, and environmental gains, and avoid locking in economic development patterns that will do permanent and escalating damage to the ecological systems that sustain all human health and livelihoods.

National Determined Contributions (NDCs) represent a first step in policy commitment for governments to protect the health of their citizens, while offering immediate and local health benefits. As countries deliberate on their climate change pledges ahead of COP26 in Glasgow, unprecedented commitments are the only chance to meet the targets set in Paris six years ago. According to the United Nations Environment Programme, the NDCs must be 3 times as ambitious as they currently are if the temperature rise is to be below 2°C by 2100, stretching to 5 times more if the rise is to be kept below 1.5°C this century – nothing short of net-zero emissions by 2050 will suffice.

With each passing year that the world fails to deliver, the scale of the task increases, causing the need for ever more ambitious targets. As seismic as the Paris Agreement was in terms of being a major political step towards reducing the risks of climate change, the NDCs that accompanied it do not match the same ambition – even if the agreed reductions in greenhouse gas emissions are fully implemented, the global average temperature will still increase by about 3°C above preindustrial levels by the end of the century. This translates to an unliveable operating space for the health of large sections of the global population.

Effective climate action can result in dramatic improvements in health outcomes. Studies have shown that the health co-benefits of climate action can arise through several pathways, including improvements as a result of reduced air pollution and behavioural change s. The International Energy Agency have estimated that a “Clean Air Scenario” could result in saving 3 million premature deaths worldwide by 2040, as well as providing energy access for all. In China, under the same scenario, average life expectancy would be increased by 15 months, and in the US, clean energy policies could prevent 175,000 premature deaths by 2030, and 22,000 annually thereafter.

In order to avoid the worst health impacts of climate change, countries can prioritise those climate interventions with the largest health, social and economic gains. This includes guiding a just and inclusive transition to renewable energy to save lives from air pollution, particularly from coal combustion. Alongside the commitment to ending energy poverty in households and health care facilities. Africa is uniquely placed in this regard.

Two-thirds of this exposure to outdoor pollution results from the burning of the same fossil fuels that are driving climate change. Renewable energy sources and energy storage solutions continue to drop in price, increase in reliability, and provide more numerous, safer and higher paid jobs. Factoring in the full economic and social consequences, and taking decisions in the public health interest, will tend to favour renewable energy sources, leading to cleaner environments and a healthier population.

Building climate resilient health systems

The effects of climate change – from more intense storms and floods to more frequent heatwaves, and the spread of infectious disease – threaten to undermine decades of health gains. Ultimately, the externalities of the climate crisis will find their way into the internal health systems. Health systems are already responding to the health emergency that climate change brings. They therefore need to be increasingly strengthened so that they can continue to be efficient and responsive to population health, as climate change causes increasing instability in the systems. Future health impacts of climate change will depend largely on the socio-economic responses to changing environmental conditions,

as well as the preparedness of communities and health systems to avoid preventable health problems.

Governments can evaluate the resilience and preparedness of their health systems to ensure adequate planning for climate change adaptation, through Vulnerability and Adaptation Assessments, as promoted by the WHO's Health and Climate Change toolkit. These assessments can provide information on the extent and magnitude of likely health risks attributable to climate change, as well as suggest priority policies and programmes that ought to be implemented to prevent or reduce the severity of future impacts.

National Adaptation Plans (NAPs), established under the United Nations Framework Convention on Climate Change (UNFCCC) agenda, are a process employed by countries to identify the medium- and long-term adaptation planning needed to help them respond and adapt to the impacts of climate change. Many countries have taken a sector-based approach to adaptation planning to establish their priorities, using key sectors and systems as the basis for assessing vulnerabilities and identifying adaptation actions to tackle these. Bringing the health sector into NAPs is key to establishing a holistic approach to tackling the climate-health nexus. Adequate representation of the health sector presents opportunities for strengthened collaboration to promote health across all sectors and in constructing coordinated cross-sectoral efforts in adaptation planning for health resilience and implementation of adaptation actions.

Of the 19 countries that submitted NAPs to the UNFCCC NAP portal in 2020, all identified health as a high-priority sector, along with agriculture and food security. Seventeen NAPs (almost 90%) included water, and 3 of these (16%) explicitly identified sanitation. Recognizing the cross-sectoral nature of climate change adaptation and mitigation, efforts are needed to ensure synergies among actions in different sectors and to invest in the systems and capacities that support action across all sectors and levels. These include climate services, coordination mechanisms and social protection systems.

One of the main intentions in building climate-resilient health systems is to make sure the health system is not a contributor to escalating carbon emissions. The promotion of "low-carbon healthcare" can advance health-strengthening imperatives and provide an approach for designing, building, operating, and investing in health systems and facilities that generate minimal amounts of greenhouse gases. Low-carbon healthcare approaches puts health systems on a climate-smart development path, aligning health development and delivery with global climate goals. The United Kingdom's National Health Service has recently embarked on a process to decarbonise its health delivery, and the 'Low-carbon healthcare in the Mediterranean project' aims to set up a low-carbon healthcare toolkit that can enable hospitals in Mediterranean countries to replicate best practices from the project's pilot hospitals. Action to cut the health system's carbon footprint is alongside building adaptive capacity and resilience with the intention to lead to direct benefit for patients.

"such benefits can be quantified and expressed as monetary gain. In the 20-year period, 1970-1990, the total benefit of the Clean Air Act was estimated at a mean of $US22 trillion"

Climate positive policies can both further positive health benefits as well as provide an economic case for action. Studies have shown that in the US an additional 230,000 Americans annually would have died prematurely and millions more would have suffered illnesses ranging from mild respiratory symptoms to heart disease, chronic bronchitis, asthma attacks, and other severe respiratory problems if not for the Clean Air Act. Furthermore, such benefits can be quantified and expressed as monetary gain. In the 20-year period, 1970-1990, the total benefit of the Clean Air Act was estimated at a mean of $US22 trillion . Without the Clean Air Act, several metropolitan areas in the US would have had higher concentrations of particulate matter than Bangkok, Thailand; Bombay, India; Manila, Philippines; and one US metropolitan area would even have been worse than Delhi, India - one of the most polluted cities in the world).

City and municipal leadership across Africa and Europe could play a transformative role in reducing the air pollution levels in both continents, and with both Skopje and Johannesburg ranking amongst the top 10 cities with the worst air quality on Earth according to IQ Air, prioritising lowering pollution levels in cities through clean cooking solutions and cleaner road transport is a key shared issue. The IEA note that transport accounts for 24% of global total CO2 emissions, of which road transport contributes almost 75%. Investing in clean urban transport, especially in affordable public transport, would not only reduce emissions and air pollution (both in terms of the environmental impact and the cost on health systems), but also boost mobility and potentially labour productivity, particularly in developing countries.

Recognising the interconnections between human, animal, and ecosystem health

In addition to the direct impacts on the economy, societies and people's health, rapidly advancing climate change negatively impacts many of the world's species and their ecosystems, driving biodiversity loss. At the same time, protecting and restoring biodiversity is crucial to addressing climate change.

The animal–human–ecosystems interface, in the light of a changing climate, risks a reduction biodiversity. The biological diversity we see today is

Clean cooking solutions

Air pollution is not caused by fossil-fuel powered transport alone. Nearly 4 billion people globally lack access to modern cooking solutions globally, including 900 million in Africa. Biomass cookstoves are one example that highlights the Gordian Knot of climate, health, and development – they contribute to over half of global total black carbon emissions, contribute to deforestation cost $2.4trillion annually to the global economy, and cause over 4 million premature deaths each year – disproportionately affecting women and children.

The Africa-Europe Foundation Strategy Group on Energy, together with the Clean Cooking Alliance, have launched a manifesto for clean cooking solutions, calling for action from governments, the private sector, and global development actors, to bring about clean cooking solutions worldwide and take a key step towards bringing clean energy access to all by 2030.

At both COP26 and the AU-EU Summit, Africa and Europe have the opportunity to take the lead on cooperating to implement the manifesto, and demonstrate that the Africa-Europe partnership is willing and able to make serious commitment towards transformative change.

the fruit of billions of years of evolution, shaped by natural processes and, increasingly, by the influence of humans. It forms the web of life of which we are an integral part and upon which we so fully depend.

There is an enormous reservoir of pathogens in animal hosts, and through reductions in biodiversity and habitat loss, humans are living in ever-closer proximity to their environment. The COVID-19 pandemic caused by the infectious agent SARS-CoV-2 is perhaps the most infamous example of that interconnection, but illnesses such as malaria and Lyme disease have severe health implications for populations in Africa and Europe. Drawing together human, animal, and environmental health into a single gaze we realise that climate impacts will most likely accelerate the likelihood that a previously unknown pathogen could emerge from a wildlife source at any time and in any place and, without warning, threatening the health, well-being, and economies of all societies. Indeed, known pathogens such as malaria are also causing new problems, as changing temperature and rainfall patterns mean mosquito populations can proliferate at higher altitudes, malaria can reach new regions.

"The question remains, why were we not better prepared, both at a technical level, and at a social level."

Disease X was the was the name adopted by the World Health Organisation (WHO) in February 2018, for a serious international epidemic could be caused by a hypothetical unknown pathogen. Scientists knew it would most likely emerge from an animal to human spill over zoonosis – after all, of the new human pathogens detected in the last three decades, 75% have originated in animals . Previous decades should have provided a dress rehearsal for pandemic preparedness. Starting with the severe acute respiratory syndrome (SARS) coronavirus in 2003, H1N1 "swine" influenza in 2009, Middle East respiratory syndrome (MERS) in 2012, chikungunya in 2014 and Zika in 2015, as well as Ebola from 2014 to this day. The question remains, why were we not better prepared, both at a technical level, and at a social level.

Nature-based solutions, such as the provision and management of biodiversity, provide a way to facilitate human health and well-being, and mitigate the negative effects of climate change. Green spaces are used as natural health clinics to promote human health and well-being, while at the same time providing habitats for a range of species and fostering conservation goals. A large body of research shows that contact with green space can improve human health and well-being, through for example reducing stress, depression, and negative emotions, and improving positive emotions, mental well-being, cognitive abilities and increasing physical activity, suggesting that nature can promote public health and prevent NCDs. Moreover, evidence suggests that positive experiences in nature contribute to feelings of connection to nature, which could also result in greater acceptance of nature conservation activities, and thereby protection of our foundation of life on earth.

The growing recognition of the importance of biodiversity's contribution to human health offers great potential for maximising synergies between public health, climate change adaptation and nature conservation.

Initiatives aimed at alleviating the climate change drivers of food insecurity, irregular migration and land degradation – such as the Rural Resilience Programme can better buffer impacts of future catastrophic climate change. Thise programme will equip small-scale producers, the landless poor and their communities with the resources needed to implement locally appropriate, proactive resilience strategies. This results in building shorter,

The Great Green Wall

One nature-based solution is the Great Green Wall (GGW), an African-led approach to the climate-development nexus launched in 2007. Aiming to combat desertification and land degradation, sequester 250 million tons of carbon and create 10 million rural jobs by 2030, the initiative is an example of the holistic approach to climate change and development proposed in the 2020 High-Level Group report.

Supported by more than 20 countries in Africa, as well as the World Bank, the African Union, and the UNCCD, at the January 2021 One Planet Summit French President Emmanuel Macron announced the launch of the Great Green Wall Accelerator, an instrument to facilitate monitoring and evaluation of financing, and address funding gaps in key areas. If funding promises of $14 billion are delivered, along with supportive policies for concrete action, the initiative has the potential to be truly transformative.

At the AU-EU Summit in 2022, both continents have opportunity to build on this one year on, and commit further to supporting the Accelerator in order to see the GGW achieve its 2030 targets.

more robust supply chains for food; addressing food insecurity and undernourishment; increasing employment; and promoting biodiversity.

Whose problem?

The same power imbalance, call it inequality or injustice, that exists in the world of global health – also exists in the world of climate action. All too often, in both domains, oxygen is stolen by those with the power – be they global north actors, or simply foreign actors with a different view of the problem from local lived experiences. As such, many of the most important voices in global health and climate change are not represented in mainstream sources and journals – which also means data from the Global South is harder to find.

Effectively addressing the climate-health nexus will need to bridge these power imbalances. Who gets to tell the story, who gets a seat at the table, and who is ultimately burdened with the financial and human cost of solving the climate and health crisis? These are the questions the global community will need to confront if it is to start to address the situation.

High-income countries are historically the most responsible for the proportion of global greenhouse gas emissions, while low and middle-income countries suffer its consequences the most. Regions and populations already experiencing the most increase in diseases attributable to the effects of temperature rise are those least responsible for causing greenhouse gas warming of the planet. In 2019, the average global carbon dioxide emissions per person were approximately 4.72 tons (tCO2/yr). In the then EU28, this average stood at 6.41tCO2/yr, stretching to 9.14 tCO2/yr for the rest of Europe and 16.06tCO2/yr for the US. By contrast, the average in Africa was 1.11tCO2/yr – approximately where it has remained for the past century.

Power imbalances also affect the proposed solutions to climate change. Climate financing is crucial to protect the most vulnerable countries from the worsening health impacts of climate change. At COP15 in 2009, high-income countries decided to mobilise $100 billion a year by 2020 to support the transitions of developing nations. This target has yet to be met. There are calls for these governments to deliver on this promise at this year's COP26 meeting – replenishing the funds of the UNFCCC's financial mechanisms, such as the Green Climate Fund, Adaptation Fund and the Least Developed Countries Fund. The global responses to COVID-19 have shown us that when there is sufficient political will, vast sums of money can be moved very quickly – and similar action is needed if the most catastrophic effects of the climate crisis are to be avoided .

A successful Africa-Europe partnership hinges on the response to the climate crisis. Europe's aging population will lack the workforce to deal with the adverse health effects of climate change, and in Africa barriers to financing green development initiatives remain. As well as investing in renewable and cleaner energy sources, both continents should focus on building climate-resilient health systems, particularly the delivery of care in rural areas, and on looking at the trends in climate-health and development, to mitigate and prevent the economic insecurities brought about by climate change, and the subsequent impact that has on health systems.

SECTION 03

What lies ahead? The future of Digital and Artificial Intelligence in Healthcare

The COVID-19 pandemic has highlighted how vulnerabilities in health systems can have profound implications not only for public health, but also for economic development, trust in governments, and social cohesion. With healthcare systems around the world struggling to deal with cases, there has been a significant knock-on effect on the diagnosis and treatment of other diseases. The pandemic demonstrated the importance of ensuring adequate numbers and a balanced skill-mix of health professionals, as well as the necessity for an overview of how professional competence is developed, maintained and demonstrated across countries. For a strong health system, the health workforce is the critical building block.

In 2013, sub-Saharan Africa had a deficit of an estimated 1.8 million health workers. This deficit is projected to rise to 4.3 million by 2035, according to the WHO. The dearth of healthcare professionals (the WHO recommends 445 healthcare professions such as doctors and nurses per 100,000 population) means many countries in Africa have turned to urgent innovative solutions to address the shortfall.

As nations race to implement the 2030 Agenda for Sustainable Development, and take steps to regain the advances that have been potentially lost due to the COVID-19 pandemic, the shortage of healthcare workers along with unprecedented strain on health systems has triggered an accelerated opportunity for digital healthcare solutions as a means of achieving universal health coverage. Digital health has been a critical tool for most patients, health service providers, and professionals to connect due to stringent lockdown measures and navigate social distance as the “new normal”. Europe’s telehealth market, which has grown substantially during the pandemic, will require business model revision. By 2026, the market is estimated to grow by more than a four-and-a-half-fold, reaching €17.35 billion ($20.7bn) revenue from €3.69 billion ($4.41bn) in 2019. The trends are similar in Africa – by 2030 the health market is estimated to be at 259 billion USD; the second largest after the US.

One key area of the future healthcare landscape is the increasing incorporation of artificial intelligence (AI) into health digitisation efforts. It is estimated that AI technologies could save the global healthcare industry $160 billion by 2030, including robot-assisted surgery, virtual nursing assistants, administrative workflow, workflow improvements, fraud detection, and reducing dosing errors, among other applications.

AI’s proliferation has also impacted individual lives; by 2030 there will be 50 billion Internet of Things (IoT) devices in use around the world. The explosion in wearable devices, including fitness smartwatches, sleep trackers, and electrocardiogram (ECG) monitors, comes at a time when people have increased access to information on health through the internet. This presents an opportunity to empower people to play a more active role in their own healthcare. In Europe, some patients prefer the option of virtual consultations based on data received via wearables, instead of having to go to into a clinic. In Africa, wearables and sensors are opening up possibilities for easier monitoring of individuals’ and communities’ health in remote and rural areas.

The value of digital technologies, including AI, has been widely recognised on the political stage. As part of the African Union (AU) ‘Agenda 2063: The Africa We Want’ – a shared strategic framework for inclusive growth and sustainable development in the region - the Digital Transformation Strategy for Africa indicates the objective “to harness digital technologies and innovation to transform African societies and economies to promote Africa’s integration, generate inclusive economic growth, stimulate job creation, break the digital divide, and eradicate poverty for the continent’s socio-economic development and ensure Africa’s ownership of modern tools of digital management.”

Similarly, in Europe, the European Union (EU) Chair for Special Committee on Artificial Intelligence in a Digital Age, Dragos Tudorache, stated: “Over the next decades, AI will help us predict, prepare for, and manage future pandemics; discover new drugs and treatments, and provide personalized medicine like never before…”. As part of the “European Initiative on AI”, the Coordinated Plan on AI outlines the EU’s strategies, financial commitments and vision for AI that is centred around an “ethical AI”.

Digital and AI technologies offer transformative potential for the health sector, but they require certain fundamentals: digital connectivity for both the provider and user, digital skills, and affordability. Rolling out digital health solutions also needs new cadres of health workforce with specialised skills in digital health and AI, substantial amounts of data

(which will need to be collected and managed in a way that protects privacy and rights of citizens), and a minimum digital literacy level amongst service recipients. Once these are in place, countries can move to the next step of digitising, storing, and aggregating personal medical records for the application of AI to improve treatment efficacy, doctor evaluation, medical teaching, anomaly detection, disease prevention, and foresight modelling and analysis.

Implementing these fundamentals requires bridging the digital divide in both Europe and Africa securely and inclusively, with coordinated financing plans – which are currently few and far between.

An inclusive, multi-stakeholder approach is needed in order to achieve greater digital inclusion across Africa and Europe, such as the collaboration between Orange AMN (Africa Mobile Networks), and the European Investment Bank for rolling out mobile phone coverage in remote rural areas in Cameroon and the Democratic Republic of the Congo. As a result of this initiative, 2 million inhabitants, who previously had no connectivity, are now able to access digital mobile services, including data and financial services, which will enhance the adoption of digital health solutions. Europe is not the only actor interested in partnering on Africa's digital transformation, however – Google recently announced a planned investment of $1billion over five years in Africa, including the Equiano subsea cable that will run from Portugal to South Africa, with connection points in Namibia, Nigeria, and St Helena. The cable targets bringing faster, lower cost internet to citizens in connected countries.

"Bold collaboration on large-scale projects, such as satellites, can have a transformative effect towards bridging the digital divide."

The Africa-Europe partnership can go even further. Bold collaboration on large-scale projects, such as satellites, can have a transformative effect towards bridging the digital divide. In rural and hard-to-reach locations on both continents, satellites are a quick and cost-effective means of reliable connectivity to hundreds of Wi-Fi and mobile connection points. "The Lisbon Manifesto on Earth Observation for Africa and Europe", signed in June 2021, underlines reinforcing cooperation in this area as the main instrument for digital and environmental transitions, as well as for fostering scientific, technological, and business cooperation between Africa and Europe with the aim of developing Earth Observation satellites. Moreover, fifth-generation global wireless standards (5G) will impact digital health and AI due to their ability to provide high speeds, support many connected devices and offer ultra-reliable technological advances as well as access to data.

The HLG propose that the Africa-Europe partnership focus on three areas to realise the maximum benefit from digital healthcare solutions: a legal and regulatory framework, an African Health Data Space, and the AEF Health Workforce Foresight Observatory.

A Robust Regional AI Legal and Regulatory Framework and Implementation

Digital rights activists around the world have been warning of the risks of the misuse of AI data and digital technologies in healthcare, and designing a strong legal and regulatory framework to ensure the ethical use of the technologies will be key to preventing exploitation of the technologies and building trust in this new phase of global healthcare. In April 2021, the European Commission outlined their approach to boost investment and set ethical guidelines to connect and strengthen AI research centres across Europe; ensure data protection and transparency; and maximize the impact of cooperation across the EU, defining the way forward together. A similar appropriate regulatory framework linking data access and protection can create an enabling environment for developing artificial intelligence in Africa.

According to the WHO, 42 out of 54 African countries have reported having a national e-Health strategy; but the interconnection of networks across borders is needed. There is political will to establish a continental and cross-regional coordination framework for Africa's overall digital and AI agenda - in 2019 the AU task force on AI called for a structural regulation on AI to manage the benefits of technology for Africans and to foresee and curb the risks, and in 2020 President of South Africa and Chair of the African Union Cyril Ramaphosa called for an African AI Forum, aiming to capitalise on the tech-literacy of Africa's youth.

The European Commission's March 2020 Communication 'Towards a Comprehensive Strategy with Africa' expressed a desire for the two continents to partner in a digital transformation, and the first priority for this partnership is the establishment of regulatory environment for competitive and harmonized regional connectivity markets. The Strategy details the requirement of regulatory convergence between the regional partners, including strengthening personal data protection, investment in key enabling sustainable infrastructure, and greater education and training opportunities.

To make the most of existing opportunities on the African continent, investment is needed to strengthen the underlying infrastructure and systems for digital health by applying the lessons learned in the EU. African countries should put in place a continental strategy on AI for Health that draws on lessons learnt from Europe's own Coordinated Plan to bring in a transparent and

harmonised regulatory framework and ensure ethical applications of AI across the continent.

An African Health Data Space

One of the biggest challenges in the rollout of digital healthcare solutions in Africa is the more general lack of access to healthcare, particularly in rural areas. Existing challenges to digital health deployment include poor coordination of pilot projects, weak health systems, lack of skills and knowledge, and poor infrastructures such as connectivity and interoperability. Lessons learned from existing digital health efforts indicate that they are a means to an end, not as an end in themselves. Strategies and implementation of regulatory frameworks, investments, and partnerships should permanently be anchored in specific contexts and driven by results and data.

The creation of a European Data Space is one of the priorities of the European Commission 2019-2025 – including for the health sector. The European Health Data Space (EHDS) will promote a more robust exchange and access to different types of health data (electronic health records, genomics data, data from patient registries, etc.), not only to support healthcare delivery but also for health research and policy making purposes. The EHDS will facilitate the collection and sharing of data across the EU, with benefits for patients, clinicians, researchers and health systems.

Europe has the opportunity to pioneer an ethical and human rights-based legal framework for digital health and data management, and as with the Coordinated Strategy on AI, there may be best practices and lessons of interest for the African Union in designing and developing their own framework for AI, and going forward, on further digitising and integrating health systems across the continent.

The planning and launch of an African Health Data Space in a similar vein to the EHDS could be a game-changer. If Africa can establish a similar health data space within five years, the two data spaces could provide a strategic gateway for Europe and Africa to collaborate on mutually beneficial research on AI. Aligned to goals for interoperability as indicated in Agenda 2063 in the Digital 2030, the two spaces would aim to "promote open standards and interoperability for cross-border trust framework, personal data protection, and privacy"; and "build a vibrant sector approach to digitalization of the agriculture, health and education sectors."

The African Health Data Space would serve as a central nervous system where Africa's current health data from existing efforts could be collated and linked. For example, various initiatives on the continent such as Airtel Tanzania's free service that sends text messages about infant care to parents and pregnant people and the South African messaging platform MomConnect "a mobile messaging platform integrated with a national pregnancy registry and a help desk for questions and feedback", could be connected through the service. It would also connect, capture and analyse previously disseminated lifesaving health information shared during the 2014-2015 Ebola crisis with people in rural and quarantined areas; for future pandemics' response at community level.

The African Health Data Space could also be a tool to facilitate Africa's genomes initiative to capture and share data on Africa's genomes responsibly. Currently, only 2% of the world's human-genome catalogue represents people of African origins. This is not only a damning indictment on the inequities in health research, but also a demonstration of the enormous untapped data resource that may lead to better treatments and a greater understanding of disease prevention globally. The Human Heredity and Health in Africa (H3Africa) project that aims to sequence three million genomes could be incorporated into the African Health Data Space to correct this fallacy. Just as AI can democratize the sequencing field, it is critical to ensure greater representation of African genetic data in global databases in order to avoid encoding unconscious biases and reinforcing structural inequalities into these tools.

To be led and owned by African institutions and actors, the African Health Data Space could also ensure coordinated infrastructure building, incorporate and embed homegrown digital health content and solutions. The ownership of the value of the data must remain within Africa– and as the market for mass data increases, Africa could provide a new model for using data to help support its SMEs across the continent, rather than remaining a client of multinational tech firms.

The Africa-Europe Foundation Health Workforce Foresight Observatory

The total global number of health workers needed to provide universal health coverage by 2030 was forecast at 54 million before the pandemic, an estimation that did not include critical skill mixes and cadres needed to expand into digital health and AI. The WHO's Global Strategy on Human Resources for Health Workforce 2030 estimates that between 2013 and 2030, the shortfall in the health workforce in Europe will be at 1.4 million, and Africa's at 6.1 million. For the Africa-Europe partnership to be successful, avoiding the donor-recipient model of the past will be key, with African countries training healthcare professionals, only for European countries to actively recruit them and reap the benefits.

Both Europe and Africa share an additional shortfall regarding the workers for the IT systems the health sector will need. Software engineers, product and system designers, logistics managers, data analysts,

The Foresight Observatory on Health Workforces

The Africa-Europe Foundation's Strategy Group on Health has the bold ambition of proposing the Building on the work done by the WHO's Global Health Workforce Alliance, the Africa-Europe Foundation's Strategy Group on Health has the bold ambition of proposing the creation of a much more comprehensive Foresight Observatory on Health Workforces. Even before working on training or career paths, we need accurate data about the current and expected needs of the health workforces on both continents. Building upon variables such as expected population growth, technological and social change, skills mix, individual performance, and health policy, clear assessments and recommendations are needed not only on training numbers but also on future staff requirements in terms of skills.

The healthcare workforce of the future will require its professionals to work increasingly in multi-disciplinary teams, that include not only the traditional health workforce stakeholders such as doctors, nurses, pharmacists, health managers, and laboratory health workers but also environmental, public, community, and traditional health workers, data scientists, AI engineers, medical drone designers, genetic counsellors, and even pharmaceutical and equipment manufacturers – to only name a few. Such a Foresight Observatory would provide intelligence to inform better workforce planning and help policy-makers to address the issues of recruiting, training, developing, distributing, deploying, retaining, motivating and managing the future health workforce.

biostatisticians, AI developers, are all crucial to the success of digital technologies in health, and planning for the workforces of the future must take this into account. Training health workers in digital technologies and creating a pathway within the IT sector to bring workers into the healthcare sector will be crucial – requiring a framework for training on the ethics, privacy, safety, and security issues specific to healthcare. Addressing these educational needs and supporting innovation will not only provide skills to existing workers, but open up more avenues for decent work in both Africa and Europe, as well as support for the digital economies of both continents.

Building on the work done by the WHO's Global Health Workforce Alliance, the Africa-Europe Foundation's Strategy Group on Health has the bold ambition of proposing the creation of a much more comprehensive Foresight Observatory on Health Workforces. Even before working on training or career paths, we need accurate data about the current and expected needs of the health workforces on both continents. Building upon variables such as expected population growth, technological and social change, skills mix, individual performance, and health policy, clear assessments and recommendations are needed not only on training numbers but also on future staff requirements in terms of skills.

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The proposed AEF Health Workforce Foresight Observatory is aligned to the AU's 2030 Digital Strategy to "build inclusive digital skills and human capacity across the digital sciences, judiciary, and education, both technical and vocational, to lead and power digital transformation including coding, programming, analysis, security, blockchain, machine learning, artificial intelligence, robotics, engineering, innovation, entrepreneurship, and technology policy and regulation"; and also to Agenda 2063's goal to "transition to an Innovation-led, Knowledge-based Economy, … Human Resources must be empowered with the necessary skills and greater emphasis must be placed on innovation and on appropriate adaptation of technology and existing research results. It is necessary to promote creativity and innovative technologies to locally process the continent's abundant natural resources and create more wealth and jobs for the youth on the continent".

The future we could see

Ensuring a robust regional AI legal and regulatory framework and implementation lays a solid foundation to bridge the digital divide, escalate cybersecurity and protection to increase the trust of institutional partners and citizens, and attract

Investing in a generation

Capitalising on Africa's young population will only further incentivize Africa-Europe collaboration through the AU's flagship project of the Pan African Virtual and E-University, where a planned AI Observatory was proposed to address the Agenda 2063 need for accelerating the development of human capital, science, technology, and innovation. Infusing the proposed AEF Health Workforce Foresight Observatory as a continuation of an existing successful setup will revolutionize how both continents will meet the health workforce needed in the digital age and welcome the integration of AI into health policymaking and practice.

funding and investments into the African region. The existence of an African Health Data Space while monitoring the implementation of the regulatory framework will also create a comprehensive pool of data and efforts, and at the same time identify gaps and fulfil the prerequisites as needed for accelerating digital health solutions and AI on both continents. The AEF Health Workforce Foresight Observatory will bring a holistic approach to addressing the gaps in healthcare workforces, allowing Africa and Europe to co-lead methodology and mindset change when it comes to human resource and digital health discourse. As both continents deal with the effects of the climate crisis on their health systems, being able to use trends to predict workforce needs will enable greater climate resilience and preparedness.

Digital health solutions and AI have the potential to enhance clinical decision making, to mitigate workforce shortages and to increase efficiencies in health services at a macro-level. AI tools can support predictive analysis or emergency preparedness and assist in tailoring programmes to target areas. Whether implemented in combination or as stand-alone projects, the High-Level Groups suggested actions can put both Africa and Europe on the road to Leaving No One Behind by 2030 and creating the Africa We Want by 2063.

List of acronyms and abbreviations

AEF Africa-Europe Foundation

AfCFTA African Continental Free Trade Area

Africa CDC Africa Centres for Disease Control and Prevention

AI artificial intelligence

AMA African Medicines Agency

AR6 sixth Assessment Report

AU African Union

AVATT African Vaccine Acquisition Task Team

CO_2 carbon dioxide

COP United Nations Climate Change Conference

COVAX COVID-19 Vaccines Global Access Facility

COVID-19 coronavirus disease

EIB European Investment Bank

EU European Union

G20 The Group of 20

Gavi Gavi, the Vaccine Alliance

GGW Great Green Wall

Global Fund Global Fund to Fight AIDS, Tuberculosis and Malaria

HERA European Health Emergency preparedness and Response Authority

HLG High-Level Group of Personalities of the Africa-Europe Foundation

IEA International Energy Agency

IMF International Monetary Fund

IoT Internet of Things

IPCC Intergovernmental Panel on Climate Change

IPPPR Independent Panel for Pandemic Preparedness and Response

MERS Middle East respiratory syndrome

NAPs National Adaptation Plans

NCDs non-communicable diseases

NDCs Nationally Determined Contributions

PPE personal protective equipment

Ppm parts per million

SARS severe acute respiratory syndrome

SARS-CoV-2 severe acute respiratory syndrome coronavirus 2

SDGs Sustainable Development Goals

SDRs Special Drawing Rights

SEK Swedish Korona

SII Serum Institute of India

tCO_2/yr tons of carbon dioxide emitted per person per year

TRIPs Trade-Related Aspects of Intellectual Property Rights

UN United Nations

UNCCD United Nations Convention to Combat Desertification

UNFCCC United Nations Framework Convention on Climate Change

WHO World Health Organization

WTO World Trade Organization

High-Level Group of the Africa-Europe Foundation

Mo Ibrahim Co-Chair of the Africa-Europe Foundation, Founder and Chairman of the Mo Ibrahim Foundation

Etienne Davignon Co-Chair of the Africa-Europe Foundation, President of Friends of Europe, Belgian Minister of State and former Vice- President of the European Commission

Ellen Johnson Sirleaf Honorary President of the Africa-Europe Foundation, Former President of the Republic of Liberia and Nobel Laureate

Mary Robinson Honorary President of the Africa-Europe Foundation, first woman President of Ireland and Chair of the Elders

Louise Mushikiwabo Co-Chair of the Strategy Groups of the Africa-Europe Foundation, Secretary General of the Organisation Internationale de la Francophonie and former Minister of Foreign Affairs of Rwanda

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