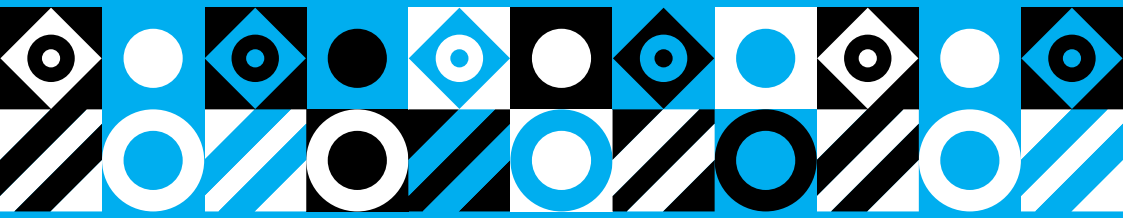
HEALTH SCOPING REPORT



STRENGTHENING AFRICA'S HEALTH SYSTEMS

For Pandemic Preparedness

AFRICA EUROPE FOUNDATION

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INTRODUCTION

In the face of a climate emergency and as both continents come to terms with the realities of the COVID-19 pandemic, there is a new sense of urgency for Africa and Europe to come together to modernise and revitalise not only their formal relations, but also the underlying narrative.

Both have a shared interest in implementing Agenda 2030, tackling global health crises, combatting the climate emergency, ensuring food security and forging better connectivity.

While 2020 has opened up new space for Africa and Europe to reimagine their relationship and agree on areas for deeper cooperation, 2021 will see ideas turned to action, as the two forge ahead in revitalising their relationship.

This landmark year includes plans to hold the 6th African Union-European Union Summit, as well as to deepen the Africa-EU partnership across multilateral fora including COP-26, the UN Summit on Food Systems, the UN high-level dialogue on Sustainable Energy and the Global Health Summit.

As Africa and Europe embark on this renewed partnership, Friends of Europe and the Mo Ibrahim Foundation are delighted to play a role in driving an ongoing and strategic conversation through the Africa Europe Foundation Strategy Groups. These independent fora will aim to influence decision-making, offer innovative proposals for impactful initiatives, and build inclusive networks with the will to create positive change.

Meant to advise and provoke the Strategy Group, this scoping report represents a starting point. It provides a state of play on the issue at hand, an overview of challenges and opportunities, and a selection of case studies from across both continents. It also includes initial recommendations of points for discussion and a list of guiding questions to drive debate.

The report also encourages the reader to keep in mind the cross-cutting themes which should underpin all Strategy Groups: climate, youth, gender, SMEs, governance and mobility.

We hope that you find the contents of this report informative, and that they help you to start thinking differently about the issues.

While extensive, the contents of this report are by no means exhaustive. We look forward to digging deeper into the issues with you in the months and years ahead.

EXECUTIVE SUMMARY

Africa and Europe face unique opportunities, challenges and lessons to be learned on the impact of demographics on health and healthcare systems, including the influence of population structures on health crises and post-crisis recovery.

Africa is particularly vulnerable to disease outbreaks. On average, over 40 are being monitored at any given time. In 2014-2016 West Africa suffered the largest ever Ebola virus outbreak, with more than 28,000 cases and 11,000 deaths. Resilience levels in Africa are only at 39% of what is needed to sustain delivery of essential services during outbreaks and African countries face a 57% shortfall in capacities required for health security.

Even before COVID-19, it was clear that African governments and key health stakeholders would have to keep pandemic preparedness at the top of their agenda. This report aims to provide guidance to the Task Force on identifying priorities and promoting integrated approaches to disease programmes, health systems and health determinants. It will pay particular attention to strengthening health systems and pandemic preparedness.

COVID-19 has exploited health-system weaknesses but has also forced policymakers to act beyond established paradigms. Policymakers and citizens now recognise the life-or-death importance of a strong and well-functioning health system. Key points to ensure health systems can match the challenges they face include:

- prioritising health system workforces;
- planning smarter city services to cope with urban health issues;
- digitalisation;
- ensuring sufficient healthcare financing;
- factoring in climate issues;
- promoting a collaborative, multisectoral and transdisciplinary "One Health" approach;
- cross-cutting to strengthen regulations and standards.

This report features six case studies from Africa and Europe. It seeks to present solutions to short-, medium- and long-term challenges using three main tools:

Standardisation of education, certification and other processes to facilitate transnational migration of skilled health professionals around Africa;

Innovation in health practices including promotion of entrepreneurship and cross-regional learning;

Legislation to support the introduction of innovative health practices.

As the world watches Africa's response to the current pandemic and beyond, this report sees opportunities to build upon developments on the continent and seek added value from increased collaboration with Europe.

STATE OF PLAY

Africa's population was estimated at 478mn in 1980. Since then, it has grown to almost 1.3bn. Its average annual growth rate of 2.6% compares to a global rate of 1.5%. Africa is also urbanising faster than any other continent. An expected increase of 867mn in the urban population means about 56% of Africa's population is projected to be living in cities by 2050.

Africa has a fifth of the world's young people: 40% of its population was under 15 in 2015, with 19% in the 15 to 24 age bracket. Households are large, averaging almost seven people, and are often multi-generational. The continent held around 14mn refugees and internally displaced persons in need of assistance, according to 2015 figures. African countries feature as points of origin, transit and destination for labour migration, including forced and irregular flows.

In stark contrast, Europe has a high healthy life expectancy, ageing population and high-levels of transnational and intercontinental mobility. Since 2012, the number of deaths in Europe has exceeded the number of births. The European Union's population is projected to reach a plateau of 449mn by 2025 and then decrease progressively after 2030 to 424mn by 2070, a 5% reduction in 50 years. In 2015 and the first months of 2016, almost 1.2mn refugees and immigrants reached European shores, most fleeing conflict and persecution. The United Nations High Commissioner for Refugees (UNHCR) projects there will be over 20mn persons of concern in the region in 2021, made up of refugees, internally displaced people, asylum-seekers and others.

Despite their differences, Europe and Africa have much to learn from each other in seizing the opportunities and facing the challenges posed by the impact of demographics on health, health systems, and health crises.

Much of the background data in this report is taken from the 2018 World Health Organisation (WHO) report which provided a comprehensive analysis of health services and systems in Africa. The report was chosen as a primary source due to its transformative use of data and innovative approach. This scoping report aligns itself with WHO's objectives of providing forward-looking guidance to countries on setting health-system priorities, and promoting integrated approaches to disease programmes, health systems and health determinants. This report also references secondary data from other reports and data platforms that support the case for taking full advantage of opportunities and illustrate the value of collaboration.

STRENGTHENING HEALTH SYSTEMS FOR PANDEMIC PREPAREDNESS

The number of confirmed COVID-19 cases in Africa as of 16 November 2020 was close to 2mn, representing 3.6% of global cases. On that day, global recorded cases surpassed 55.3mn and the death toll was close to 1.3mn. In Africa, South Africa is worst-affected: with more than 752,000 infections it is 15th in terms of cases worldwide. In the week leading up to 8 November, new cases in Africa rose by 13% over the previous week and the death rate rose by 18%, according to data from the African Centres for Disease Control (Africa CDC). However, the reported per capita death rate on the continent has been low compared

to other parts of the world, despite poor health infrastructure in many African countries. This could be partly because of the young population in Africa, since COVID-19 has a higher mortality rate in older age groups.

The United Nations Economic Commission for Africa (UNECA) early in 2020 warned that the continent of 1.3bn could reach 123mn cases, and that 300,000 people could die of the disease, even with intense social distancing. European countries by May had carried out 23,000 tests per million people, amounting to 17mn in total, while in Africa there were just 685 tests per million.

The pandemic has underscored the need for governments and other healthcare stakeholders to make pandemic preparedness a crucial part of plans for strengthening health systems. Iceland is a good example of the way forward. It has a disaster preparedness and response plan that contributed to a successful COVID-19 response, partly by leveraging public awareness to ensure citizens' engagement and cooperation with government response measures.

Countries with some of the world's strongest healthcare systems have struggled to cope with the virus. Italy has robust universal health coverage but was one of the worst-affected countries when COVID-19 struck in the spring. The pandemic has hit the world economy hard, forcing governments into emergency monetary policies and financial measures to cushion citizens from the impact. In April 2020, the number of infections in Italy, Spain and parts of the United States surpassed the capacity of healthcare facilities, leading to the setting up of emergency centres.

The coronavirus has been reported in 54 African countries and, despite low fatality rates, the world is concerned about Africa's preparedness. Experts fear the COVID-19 impact on Africa's fragile health systems and on the region's socio-economic progress could become much worse. COVID-19's combination with existing public health challenges means the continent is bound to struggle in addressing the pandemic.

OPPORTUNITIES

In 2015, the African Union (AU) endorsed Agenda 2063: The Africa We Want, a strategic framework for the socio-economic transformation of the continent over the next 50 years, closely aligned with the UNs Sustainable Development Goals (SDGs).

The second half of the 20th century brought unprecedented growth in global business, communication and transportation. The impacts of that growth ranged from penetration of the forests of Africa and Asia to the expansion of markets for poultry, swine and other animals at risk of transmitting global pandemics. Economic and population growth accelerated deforestation and environmental degradation; and the global demand for oil and other commodities generated new wealth bringing risks of geopolitical destabilisation and environmental disaster.

COVID-19 has exposed health-system failures in countries around the world and risks widening healthcare shortfalls in Africa. Progress on broadening service coverage and financial protection was slow even before the pandemic and the goal of universal health coverage (UHC) appeared beyond reach for most countries in Africa.

Health systems in many higher-income European countries have achieved broad service coverage but face shortfalls in the quality of care, chronic social disparities in access to healthcare and soaring costs.

Although COVID-19 revealed health system weaknesses, it has also forced policymakers to seek innovative solutions.

The pandemic has shown governments and citizens the life-or-death importance of strong, well-functioning health systems with a professional frontline workforce, smarter planning, digitalisation and adequate financing. Healthcare must also take into account climate change imperatives and promote a holistic 'One Health' approach.

HEALTH WORKFORCE

Detection, diagnosis and control of zoonoses (diseases that jump from animals to humans) are often only carried out after poor veterinary, public health and environmental controls lead to the spread of human infections. Strengthening those controls and building up early response capacity to human outbreaks has to be a global priority. In the EU, intense efforts are underway to build national-level preparedness and response strategies. A long-term, holistic approach for human resource development must be adopted to reduce pandemic risks.

Currently 34 African countries have signed up to an AU protocol designed to increase the movement of people, including health professionals, around the continent. However, Sub-Saharan African (SSA) countries continue to suffer from severe shortages of human resources for health (HRH). The lack of standardisation and recognition of health professionals' diplomas prevents movement around the continent that could help address such shortages.

Africa could learn from the progress made in this area in Europe through the Bologna Process which aims to ensure comparability in the standards and quality of higher education qualifications across Europe and facilitate student and staff mobility. It led to the creation of a European Higher Education Area. The process seeks to make higher education more inclusive and accessible and increase the international competitiveness of European universities. The Bologna reform has built trust to boost learning mobility, cross-border academic cooperation and the mutual recognition of qualifications earned across Europe. Enhancing the quality and relevance of learning and teaching is also a core mission of the Bologna Process. Replicating this process can help higher-education bodies, governments, and institutions in Africa improve the quality, access and distribution of health education. It could also shed light on how to synchronise standards across the diverse health systems and diverse economies of the continent.

SMART CITIES

By 2050, almost 70% of the global population will live in cities. Already in 2020, approximately 8 out of 10 people in high-income countries and more than 40% of Africa's population live in urban areas. Rapid urbanisation poses major challenges for traditional models of healthcare delivery.

The rapid growth of cities has increased health threats related to socioeconomic and environmental factors such as housing insecurity, overcrowding, non-communicable diseases (NCDs) and a lack of clean water, sanitation and other essential services. COVID-19 has shown that cities need to provide a healthier environment and better public health. Urban design can have a powerful influence on public health and must be prioritised on health and development agendas.

The rising global burden of NCDs, such as heart disease, strokes, cancer, diabetes and chronic lung disease, presents unprecedented challenges for health systems, especially in cities. Many are already struggling to meet surging demand for NCD services. The WHO's European Healthy Cities Network promotes healthy urban planning and considers many healthcare inequities stem from variations in urban environments, such as access to shops, services, public transport, open spaces and walkable neighbourhoods.

Europe has made significant progress in understanding how urban design can directly and indirectly shape NCD risk factors including levels of physical activity; active transport modes such as walking and cycling; healthy food options; availability of health and community services for the prevention, early detection and treatment of disease; and air quality.

Urban design must promote smarter planning to deliver improved health services and ease access to digital health solutions in hospitals and clinics. Machine learning and Artificial Intelligence (AI) should be mobilised to create healthier environments.

DIGITALISATION

As of March 2020, there were over 526mn internet users in Africa. According to the Global System for Mobile Communications (GSMA), increasing mobile telephone connections in Sub-Saharan Africa are expected to contribute $184bn to GDP by 2024.

The steady growth of networks, enhancement of interconnectivity and interoperability of digital platforms in both Africa and Europe creates great potential to expand digital health systems.

There is growing international consensus that information and communication technologies can offer innovative ways to strengthen health systems in low- and middle-income countries (LMICs). E-health, e-prescriptions, online pharmacies, telemedicine, 5G mobile communications, machine-learning, AI, nanotechnology, and supercomputing all offer opportunities to transform healthcare systems. Digital tracking is said to be key to East Asia's successful COVID-19 containment efforts.

Drones are increasingly used to transport blood and medical supplies, notably in remote areas of Africa.

In Europe and Africa, telehealth service providers have rapidly scaled up their offer because of COVID-19, with 50 to 175 times more patients being seen remotely compared to before the pandemic. Increasingly, social media tools such as WhatsApp are also used to provide health services. Mental health services are among those making greater use of telemedicine. In Kenya, for example, telemedicine is used to help citizens through daily strains such as isolation, unemployment and pandemic-disrupted social lives.

Digital solutions are increasingly deployed on the continent with the world's heaviest disease burden and most severe shortage of healthcare workers. In South Africa, for example, individuals with access to fast internet have an up to 4.4% probability of holding a skilled job.

Countries in Europe and Africa have taken a variety of approaches towards greater rollout of digital healthcare solutions. These have rightly reflected national and local challenges, priorities and culture. COVID-19 has created opportunities to accelerate digital health, health-system reforms, use of digitally powered medical devices, technology, data and analytics by patients and providers. Agreement on health data protection and standards could also boost collaboration between Europe and Africa.

FINANCING

Countries that ratified the SDGs have pledged to achieve UHC by 2030, providing their people with affordable and high-quality essential health services. However, every year approximately 100mn people are pushed into extreme poverty because of healthcare expenses and over 800mn are forced to spend up to 10% of their household incomes on healthcare, according to the WHO. Increasing pandemic threats will not make these figures improve over time. Policymakers

face insistent demands to raise healthcare quality and strengthen equity, while bringing costs under control and making systems more efficient.

The private healthcare market in SSA has an estimated value of $21bn, which is projected to double over the next 10 years. Over 52% of healthcare services in Africa are provided by the private sector, a clear indicator of a thriving industry.

Private spending from employers, insurance companies and non-governmental organisations is expected to reach $28bn, representing 17% of the region's total health-sector expenditure in 2020.

Many countries have expanded the scope of benefits packages to ensure affordable access to COVID-19 diagnosis and care. Ethiopia and Rwanda, for example, have achieved high coverage levels through social protection systems that guarantee access to healthcare services. There is a broad consensus that user fees and financial barriers to health services in LMICs should be removed.

Zambia is pursuing mobile money payments to reduce the need for cash in healthcare. That can create a secure way for providers to receive and use funds quickly. Such innovations can bring efficiency gains and improve accountability, transparency and financial inclusion. They can also help cut costs as governments grapple with challenging decisions on how to respond to the economic shocks of COVID-19.

No one has all the answers, but there are some good practices around the continent which others can learn from. Algeria, Botswana, Lesotho, Kenya, Morocco, Senegal and South Africa have increased their fiscal leeway by improving tax collection capacity. Gabon, Ghana and Nigeria have earmarked more allocations to the health sector from government revenue. Tanzania and Uganda have implemented reforms to improve resource flows to health facilities and optimise spending.

Africa and Europe need innovative strategies to maximise resources as they respond to this unprecedented health crisis. Investments should be based on a long-term vision for building more resilient health systems able to withstand future shocks.

CLIMATE CHANGE

Climate change impacts human health both directly and indirectly, from deaths caused by extreme weather events to cardio-respiratory diseases exacerbated by changes in temperature and air quality.

Africa is particularly vulnerable to the health effects of climate change and although COVID-19 may have brought short-term emissions reductions, it risks adding to broader climate challenges.

Climate change and COVID-19 pose global development challenges and require responses in all countries. WHO estimates that every year about 250,000 deaths occur worldwide in low-income countries due to adverse effects of climate change, such as malnutrition, floods, diarrheal diseases and malaria.

In May 2020, organisations representing over 40mn health professionals wrote to G20 leaders highlighting concerns that the pandemic had diverted attention from the urgency of addressing climate change. They highlighted interconnections between climate change and pandemic risk and urged governments to use post-pandemic recovery packages to prioritise investments in health, clean air and water, and climate stabilisation.

ONE HEALTH

Programmes to address the main problems facing health in Africa and related sectors such as agriculture and the environment should be developed using a multiple disciplinary One Health approach. That would enable authorities to respond to and control threats posed by zoonotic diseases such as COVID-19, SARS, MERS, HPAI, anthrax or rabies which place a serious burden on resources.

Priorities identified by the WHO's Joint External Evaluation (JEE), the World Organisation for Animal Health's (OIE) Performance of Veterinary Services (PVS) mechanism, and the Global Health Security Agenda (GHSA) include:

- antimicrobial resistance (AMR);
- preparedness and response planning for zoonotic diseases;
- epidemiological surveillance, early warning and risk analysis;
- human resources for One Health;
- laboratory diagnosis and research on biosafety and biosecurity;
- international cooperation to develop coordinated preparedness and responses to health emergencies.

Among the fields offering cooperation opportunities for Africa and Europe to strengthen One Health and the GHSA are:

- knowledge sharing on AMR awareness and testing;
- collaboration on policy development and common standards;
- strengthening knowledge through surveillance and research;
- optimising use of antimicrobial medicines in animal and human health;
- sustainable investment on AMR research and development;
- technical assistance to develop coordinated strategic planning for national and international health emergency response.

KEY CHALLENGES

SHORT-TERM

- Financing systems are not flexible enough to adapt to changes in government spending needs and revenue-raising capacities. More responsive systems are needed to develop resilience; respond to shocks; maintain essential services during crises; and rapidly ensure financial protection for citizens.
- Conditional cash transfers that target poor and marginalised populations are not explicitly linked to health initiatives.
- AMR controls are not highly prioritised.

MEDIUM-TERM

- There is a lack of regional collaboration and cross-regional learning on issues such as sustaining essential health services; and overcoming barriers to financing that could provide hazard pay for health workers, support for health facilities and investment in ICT.
- Agreements that would enable cross-border provision of services such as tele-prescribing and tele-medicine are not yet in place.
- Countries have varying capabilities to develop and implement innovative health system strategies.
- Sub-Saharan Africa needs standardisation in education for healthcare professionals.
- Africans need more affordable access to the internet and mobile data; the continent has inadequate data protection and consent regulations, and cyber security standards.

LONG-TERM

- There is a huge need for leadership and investment to expand ICT infrastructure. Improvements are needed to enable electronic medical records systems, patient tracing and improved health education.
- Insufficient budget transparency makes it impossible to accurately assess countries' performance and identify financing reform needs. Real-time data on health spending must be mainstreamed and combined with data on health outcomes, service coverage and financial protection.
- Health professionals among the African diaspora in Europe need to be brought into the capacity-building process. Integrating the African diaspora into the African development framework is one of the AU's highest priorities. Diaspora groups are highly motivated, have strong connections and possess vital knowledge of their homelands' social and cultural context.
- Political will is needed to implement the recommendations of the 2019 World Bank Development Report that call for policies to build strong basic and digital skills as a foundation for lifelong learning in health.

CASE STUDIES

1. IMPROVING ACCESS TO MEDICINES THROUGH NURSE PRESCRIBING, POLAND

- **What:** The introduction of nurse prescribing aimed to improve patient care by reducing treatment interruptions and duplication, increasing accessibility for patients and improving health system performance.
- **Where and when:** Poland / 2016
- **Partners:** Implemented by the Department of Nursing and Midwifery at the Polish Ministry of Health

THE NEED

Poland has comparatively high hospitalisation rates for chronic conditions such as respiratory diseases, diabetes and congestive heart failure. The fact that these diseases are not manageable within the primary healthcare system points to inefficiencies within the sector. Primary healthcare services are provided by a mix of individual practices staffed by general practitioners (GPs) and nurses and, increasingly, group practices. Group practices usually include a range of specialists, mainly family doctors but also internists and paediatricians. These primary healthcare teams also include nurses, midwives and other professionals with varying levels of experience. Since the late 1990s, Poland has been upgrading training for nurses and midwives, including for community nurses, to align professional qualifications with EU standards.

THE OUTCOME

In 2016, a new law granted nurses the right to prescribe certain medicines under conditions. Their new tasks include: ordering and administering medicines containing certain active substances (except for medications with high potency, intoxicants or psychotropic properties) as well as nutritional foodstuffs; ordering repeat prescriptions as prescribed by a physician; ordering specific medical devices such as diagnostic equipment, blood glucose monitoring or dressings; offering referrals for diagnostic tests; and giving patients comprehensive medical examinations before prescribing medications.

Since 2016, 10,287 nurses and 4,799 midwives have completed the training enabling them to prescribe. By December 2018, nurses and midwives had independently issued 2,538 prescriptions and authorised the continuation of 363,288 previous prescriptions. Most of these prescriptions have been for medications and equipment related to noncommunicable diseases, dressings and breast-milk substitutes. Further actions comprise implementing electronic patient records in primary health care and improving electronic prescriptions. Subsequent changes have further strengthened the role of nurses, developing organisational standards that specify the role and professional competencies of nurses and midwives in specific types of healthcare services and areas of specialisation; and setting down specific qualifications for primary care nursing.

WHY IT MATTERS

There are numerous reasons for granting prescriptive authority to nurses. Research suggests it facilitates holistic continuity of care for patients; enhances early diagnosis; reduces waits for doctors' consultations; and cuts hospital admissions. This is in the spirit of patient-focused healthcare. In doing this, Poland has joined countries where nurse prescribing has increased patients' access to timely and more effective medication management.

Although some remain sceptical about nurse prescribing, many physicians in Poland have welcomed the changes.

Source:

- Brief by WHO Regional Office for Europe, part of a series of case studies intended to inspire and support policymakers, instructors, managers and clinicians to recognise and strengthen the contributions of nurses in strengthening health systems.

2. SMART CITIES, SOUTH AFRICA

- **What:** South Africa's smart city initiatives mainly focus on smart machines; organisational automation and smart mobility; and getting citizens connected to the Internet.
- **Where and when:** South Africa / 2016
- **Partners:** Implemented by the cities of Johannesburg, Cape Town and Ekurhuleni

THE NEED

The smart city concept is associated with urban planning and the use of ICT such as sensors, big data, web mapping, geolocation-based services, volunteered geographic information and the Internet of Things. The use of ICT in cities should enable smarter urban development, more efficiency, improved service delivery and individual mobility, better access to information and services, energy and resource savings, and increased citizen participation. In the three cities included in South Africa's smart city initiative, ICT has been central to strategies meant to connect citizens. This has been seen as a necessity in an era of globalisation. The application of ICT has improved governance, participation, authorities' response to problems and service delivery: for example, citizens' complaints can be easily logged online and improved Wi-Fi access has increased opportunities for citizens. The cities also have online links to health-issue websites. However, the developments have also highlighted unaddressed social inequity.

THE OUTCOME

South Africa is one of the most unequal societies in the world and smart city initiatives can further entrench those divisions. Johannesburg calls itself 'a world class African city' but its citizens inhabit two different worlds. Affluent areas can keep pace with globalisation and ICT developments, while residents in poor districts can barely afford the basics. It is difficult for cities to balance and address the digital divide. There is no doubt that ICT is crucial in local governance, digital health, efficiency and service delivery, however there are other pressing needs that require attention such as housing, service delivery and unemployment. Cities should balance the pursuit of grand designs with ICT development projects more closely tailored to citizens' needs.

WHY IT MATTERS

Too often, smart-city initiatives feature top-down planning that fails to take into account people's real needs. Instead of bringing people together, they can perpetuate inequality. As smart city ideas are developed across Africa there is an urgent need to draw up coordinated strategies that learn from the mistakes of the current uncoordinated, piecemeal approach. The starting point should be to find out what citizens want and need, then evaluate how smart city concepts can be used to bring about the required improvements.

When done right, the infrastructure of smart city ICT can significantly improve healthcare effectiveness and lower healthcare cost for smart city residents. With the introduction of mobile devices, for example, physicians can monitor patient data real time.

Healthcare providers can use this information to overcome geographic and temporal barriers, more effectively prescribe medical treatments and influence behavioural changes. Such technology can also give smart city healthcare authorities a global view of health issues within communities allowing for better planning of city services and resource provisioning.

Mobile ICT-driven healthcare can also provide continuous monitoring of behavioural patterns facilitating detection of disease symptoms. At the community level, mobile-driven ICT can enhance frontline collaborative data-sharing and communication; improve the coordination of response and recovery; and provide benefits for evidence-informed early warning, social mobilisation, advocacy, monitoring and evaluation. This has been proven in research into Ebola and Zika outbreaks.

Sources:

- Smart cities in South Africa! A case of misplaced priorities?, Walter Musakwa and Baleseng T Mokoena, Department of Town and Regional Planning, University of Johannesburg
- Using Smart City Technology to Make Healthcare Smarter, Diane J Cook, Fellow, IEEE, Glen Duncan, Gina Sprint, Member, IEEE, and Roschelle Fritz, Institute of Electrical and Electronics Engineers (IEEE)
- Digital Technology and Mobile Applications Impact on Zika and Ebola Epidemics Data Sharing and Emergency Response, Tambo E, Kazienga A, Talla M, Chengho CF and Fotsing C, Journal of Health and Medical Informatics, 2 April 2017

3. E-HEALTH SYSTEM, ESTONIA

- **What:** The Estonian e-health system aims to develop patient-friendly, efficient and high-quality healthcare services; to make time-critical medical information accessible for physicians; and to decrease the level of bureaucracy in the physicians' daily routines.
- **Where and when:** Estonia / 2008
- **Partners:** Implemented by the Government of Estonia, in partnership with the EU

THE NEED

In the years following its independence from the Soviet Union, Estonia used information technology (IT) to develop its economy and politics. Today the country is one of the most advanced in the use of digital services. E-banking, e-health, e-documents, e-education, e-taxation and e-voting are all widely used. Since IT was underdeveloped during the Soviet period, the lack of legacy software enabled Estonia

to deploy new and innovative solutions which transformed it quickly into an advanced technological society.

THE OUTCOME

Each person in Estonia who has been to a doctor has their own online e-health record that can be tracked. The system integrates data from Estonia's different healthcare providers, creating a common record for each patient (since 2015, over 95% of data generated by hospitals and doctors has been digitised). This gives the doctors easy access to the patient's electronic records, such as test results and X-ray images. Patients have access to their own and their children's records. By logging into the Patient Portal, they can review their past doctor visits, current prescriptions, and receive general health advice.

Ten years after their launch, e-health services include collecting health service reimbursement invoices; health insurance information; digital picture archiving services; electronic health record services for physician and patient; digital registration services; e-prescriptions; Social Insurance Board services; e-consultations; cross-border data exchange; data and statistics services; medical certificates; e-ambulance services; dental care services; and digital referrals. A vaccination passport service is being implemented. E-prescriptions are handled by a centralised paperless system used for 99% of all prescriptions. The system connects every hospital and pharmacy in Estonia, cutting down on paperwork and doctors' visits. Doctors can prescribe medicine electronically and at the pharmacy all a patient needs to do is present their ID card. The pharmacist then retrieves the patient's information from the system and fulfils the prescription.

WHY IT MATTERS

The Estonian e-health system is unique as it is nationwide, integrates healthcare data from all providers and offers an overview of the health condition of every resident from birth to death. Such a comprehensive data system requires a robust security system.

Security is ensured by the following techniques:

- A secure authentication and authorisation of all users with ID card, mobile ID or smart ID;
- Digital signing (by individuals) or digital stamping (by a secure authentication and authorisation by all users with ID cards, mobile IDs or smart IDs);
- Digital signing by individuals and digital stamping by institutions of all medical documents;
- Accountability and transparency provided by a secure log (audit trail) containing all actions;
- Coding of personal data to ensure its separation from medical data;
- Encrypted database records minimising confidentiality risks;
- Close monitoring and effective countermeasures to quickly identify fraud and misuse.

Digitalisation brings huge management change issues. Challenges that emerged during Estonia's switch to e-health included:

Physicians and other professionals had to change the way they fill out medical files to adopt more uniform language;

- Semantic interoperability of medical data was hard to achieve;
- Concerns on data quality and secondary usage of data had to be resolved.

Estonia's investment in building an advanced digital society began long before the COVID-19 pandemic. When COVID-19 struck, this investment paid off as Estonia's digital public services continued mostly uninterrupted. Digital health records and e-prescription services freed up Estonian doctors, nurses and administrators for the fight against the pandemic. Digital adaptation of services and platforms that were not yet digital happened quickly, sometimes in a day. Countries around the world are trying to emulate Estonia's digital strategy, but the Baltic country's success didn't happen overnight. It was the result of decades of investment and experimentation and is about much more than technology.

Privacy is enshrined in laws and regulations. Estonian citizens own their personal data, including health data, and can check online who has looked at it. Public officials cannot look at or use this data without reasonable justification and citizens can block access to their health data. Citizens embraced the digital revolution because it was transparent, fair and to the benefit of all. Estonia has also invested in infrastructure to welcome and attract tech entrepreneurs and their companies to be part of the country's ecosystem by providing ease of registration and residence, tax breaks and other incentives. Public-private partnership and trust in public institutions are the secret of Estonia's success.

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4. HEALTH FINANCING SUSTAINABILITY POLICY, RWANDA

- **What:** The health financing and sustainability vision is to ensure that Rwandans have universal affordable access to quality health services in an equitable, efficient and sustainable manner.
- **Where and when:** Rwanda / 2015
- **Partners:** Implemented by The Government of Rwanda

THE NEED

Rwanda's health financing sustainability policy was included in the government's Vision 2020 project designed to transform the country into a "middle-income nation in which Rwandans are healthier, educated and generally more prosperous." The health sector has seen successful innovation in health financing through projects such as the Community Based Health Insurance Schemes (CBHIS); the Performance Based Financing (PFP) approach for health facilities; and the Community Health Workers (CHW) cooperatives. Rwanda Vision 2020 considers health finance accessibility as a key priority. The policy aims to develop a wide-ranging financing framework for health systems based on best practices in global healthcare financing.

This framework is built on two main pillars: on the supply side, the implementation of fiscal decentralisation with increased transfers from central government to local authorities and peripheral health facilities on the basis

of needs and performance; on the demand side, the establishment of a health-insurance system including cross subsidies from higher-income to lower-income populations. These mechanisms have enabled the achievement of major health-sector targets, including reduction of unmet needs; increased use of healthcare services; fewer catastrophic health expenditures; and reduced inequality in access to healthcare. Progress has been facilitated by political commitment and a legal framework that made health insurance compulsory for all Rwandans in 2016.

THE OUTCOME

Government spending on health has surpassed the target of 15% of annual state budgets laid down in the AU's 2001 Abuja Declaration. This shows a high level of government support for health sector financing. In the 2015/2016 fiscal year, the health sector accounted for 16.52% of total government spending. Risk pooling has been greatly improved by extending community-based health insurance schemes, which give the majority of the population access to healthcare services and drugs. Social and private health insurance schemes now cover approximately 80% of the population.

Health expenditure per capita was $44.6 in 2015. Funds for primary healthcare come from government contributions, development partners, health insurance contributions, social-solidarity funding and cross subsidising among the community.

WHY IT MATTERS

Rwanda's bold reforms laid a strong investment foundation that is paying off by enabling a robust COVID-19 response.

The Rwandan government created a donor integration framework with help from the World Bank. This enabled it to secure binding agreements with donors by sharing annual development strategies and proposals for health-related projects with costs and projected timelines. In this way, it reduced the number of parallel administrative systems while improving accountability and delivery using common monitoring and evaluation systems. Similar financing reforms have been set in motion in several countries in Africa and beyond over the past decade. Management of COVID-19 funds through health financing systems could facilitate and hasten the implementation of reforms, given the imperative of using limited funds for maximum impact.

Sources:

- Primary health care systems (PRIMASYS): case study from Rwanda, abridged version, Geneva: World Health Organisation, 2017
- Acting now to strengthen Africa's health systems, McKinsey and Company article, 29 May 2020

5. CLIMATE ADAPTATION SCHOOL, GERMANY

- **What:** The school's objective is to develop an interdisciplinary education and training for medical professionals. It was designed to develop and convey a summary of weather- or climate-related health hazards and risks and the possible responses to them, focusing on preventive and diagnostic-therapeutic aspects.
- **Where and when:** Germany / 2013
- **Partners:** Implemented by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

THE NEED

The Climate Adaptation School was designed to transfer knowledge among health professionals about medical preparedness for and response to weather- or climate-related health risks and impacts. The focus was on population groups that are particularly vulnerable for medical reasons, including certain age groups such as infants and elderly people; people with existing chronic complaints such as respiratory and cardiovascular diseases or allergies; and people with limited social protection. Training packages, lectures and discussions were based around four main learning objectives:

- identify climate change-related health disorders;
- provide appropriate medical assistance for climate- and weather-related health issues;
- respond to climate-related changes in the environment with targeted medical measures, including preventive and therapeutic measures, in health facilities;
- inform and guide other people.

Speakers were recruited to a large extent within the Charité-University Hospital in Berlin. Programme content was agreed with representatives of the Innovation Network of Climate Change Adaptation Brandenburg Berlin. The teams at the Allergy-Centre-Charité and European Centre for Allergy Research Foundation (ECARF) have experience in planning training events, together with project and financial management. An advisory board was appointed to guide the scientific focus and practical delivery of training units.

THE OUTCOME

Despite a positive response to lectures, it was difficult for a variety of audiences with specific professional interests to cover all the Climate Adaptation School topics. Therefore, lectures were divided into those important for physicians in the field of internal medicine, which included modules on infectious disease vectors and infections, chronic respiratory diseases, heart diseases, allergic diseases and temperature extremes; those important for dermatologists and paediatricians, including UV damage; skin diseases under changing weather conditions; climate changes from a paediatric point of view; and balanced nutrition for recovery and stabilisation of health.

Approximately 150 physicians participated in the training sessions. They demonstrated greatest interest in the topics of climate change and respiratory diseases, pollen and allergies, UV and ozone, and the related practical consequences. Lectures focused on the risks and impacts of climate change and the associated medical responses, for example as preparation for heatwaves in doctors' surgeries and hospitals; and adaptation of prescriptions, dosage and formulation of antihistamines at the beginning of the specific allergen immunotherapy.

WHY IT MATTERS

Following extensive consultation with the advisory board, Climate Adaptation School modules (especially those on UV, ozone, heat and pollen) were offered in the context of congresses in internal medicine, allergology, pneumology and dermatology, with very positive feedback. To meet the great interest of physicians and nurses, it was recommended that the training materials should be broadened in scope and supplemented.

A request for a project extension based on Germany's climate change adaptation programme was submitted to the Federal Ministry for Environmental Protection. The aim was to extend the training materials and modules and expand their use in other educational settings such as schools, while keeping the focus on climate change and health for physicians, nurses and other

healthcare professionals. This would create capacity-building opportunities for other target groups.

The most important innovations are:

- e-learning modules on climate change and health, providing practical and scientifically sound online training for physicians and nurses, which is certified as a further-education module by the Berlin Chamber of Physicians;
- a knowledge database, in which the vast expertise of the project's scientists is made available to nurses and doctors, including lecture notes, presentations, short summaries and other information material, in ways that are easy and free to access.

Source:

- Public Health and Climate Change Adaptation Policies in the European Union, Final Report, World Health Organisation Regional Office for Europe, 2018.

6. AFRICA ONE HEALTH UNIVERSITY NETWORK (AFROHUN), AFRICA-WIDE

- **What:** The main aim is to foster One Health approaches across network members; to support national agencies to build capacity in surveillance, reporting and disease outbreak response
- **Where and when:** Central and Eastern Africa / since 2010; Continent-wide / since 2019
- **Partners:** University of Minnesota and Tufts University. Funded by: USAID Emerging Pandemic Threats Programme; IDRC, Canada; Higher Education for Development, USA Department of Defense; and Defense Threat Reduction Agency (DETRA) through Sandia National Laboratories.

THE NEED

AFROHUN was founded in 2019, after a decision to broaden the mandate of the One Health Central and Eastern Africa (OHCEA) network from a regional to a continental agenda. Expansion boosts inclusivity and enables the network to contribute to the broader vision of securing, protecting and promoting the health of the continent holistically. OHCEA was set up as a network of schools of public health and veterinary higher-education institutions in Eastern and Central Africa, a region that includes the Congo Basin, commonly considered to be a 'hot spot' for emerging and re-emerging infectious diseases. The vision is to be a global leader in One Health, promoting sustainable health for prosperous communities, productive animals and balanced ecosystems. The network supports curriculum reviews for graduate and undergraduate programmes to incorporate One Health approaches and concepts related to international health regulations and the performance of veterinary services by the OIE. It also spearheads development of short courses on themes such as Risk Analysis and One Health Leadership for in-service and pre-service training.

THE OUTCOME

The benefit of a university network is that it can draw on and mobilise a wide range of talent and address many issues to achieve efficient and sustainable development outcomes. However, it can be difficult to communicate and coordinate activities across different institutions, countries, languages, legal systems and operating procedures.

Such differences slow the pace of network activities, hinder cooperation and cause some partners to feel disenfranchised. A strong communication system and an administrative structure that accounts for the strengths and limitations of each member institution are important to keep network activities moving at a steady pace and in a mutually agreeable direction.

External funding can contribute resources and make new initiatives possible. However, local institutions and external funders have distinct operating procedures, resources and abilities, and are likely to approach university networks with different priorities and timelines. Whereas local institutions must take a long view and focus on capacity building and creating a sustainable network structure, donor agencies typically need to demonstrate progress on short-term goals. Ensuring that member institutions have more input at this stage is also advantageous in that it fosters a greater sense of ownership and increases buy-in for the creation of a sustainable long-term platform.

Collaboration is most attractive when it is among equals. Each partner wants to benefit from participation in the network, but not all institutions can contribute equally or reap the same benefits. Network partners cite 'limited and unequal access to resources' as a major factor for the fair and equitable growth of the network.

WHY IT MATTERS

Tomorrow's health professionals must collaborate across disciplines and apply One Health approaches to produce simultaneous gains in human, domestic animal, wildlife, and environmental health. Using effective cross-disciplinary collaboration will also create the potential for a multiplier effect of the efficiency and effectiveness of health interventions. However, few academic or training institutions offer capacity building programmes that truly cross disciplinary boundaries, and no institution in the Congo Basin 'hot spot' region was addressing this critical lack of capacity in the public health workforce. Therefore, OHCEA network was created to develop and implement One Health approaches and improve responses to infectious disease outbreaks.

Animal-to-human interactions provide ideal circumstances for pathogens to evolve into agents that can infect humans. Coordination facilitated through AFROHUN aims at rapid detection and response to emerging and episodic zoonotic incidents, limiting loss of human and animal life. Such an approach can reduce pandemic risks while effectively addressing common debilitating and deadly diseases.

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FOR THE STRATEGY GROUP'S CONSIDERATIONS

POTENTIAL ACTION AREAS

STANDARDISATION: Establish a commission for the standardisation of health education curricula across Sub-Saharan Africa, accompanied by a working group and steering committee to monitor the commission and hold it accountable to deliver on its goals. Benchmark the Bologna Process as a model of best practice for standardising health education; use this process to help governments and higher-education institutions in sub-Saharan Africa improve the quality, access and distribution of One Health workforce education. This will support one of the flagship projects of Agenda 2063: the African Passport and Free Movement of People which aims to remove restrictions on Africans' ability to travel, work and live within their own continent.

INNOVATION: Promote entrepreneurship and cross learning to encourage African businesses to build health-technology solutions and empower health workers to provide effective care. Collaborate with Europe to boost the use of alternative care models, such as tele-health and tele-pharmacy. Reduce, or remove, co-payments to expand affordable healthcare. Support digital health systems with sustainable financing by quantifying long-term costs of installation and operation.

LEGISLATION: Evaluate implementation of existing regulatory frameworks and accountability mechanisms and work with stakeholders in Europe and Africa to explore alternatives, for example by defining legislative guidelines for e-pharmacy. Many low- and middle-income countries (LMICs) continue to face substantial challenges in ensuring the accessibility, affordability and quality of medicine. E-pharmacy businesses have been growing rapidly in LMICs to meet demand for medicines but have raised concerns, notably by offering prescription drugs without a doctor's order. Africa can learn from Europe's long experience of health legislation to strengthen e-pharmacy regulations and improve the quality, safety and accessibility of medicine provision.

GUIDING QUESTIONS

1. How do we ensure that strengthened pandemic preparedness incorporates principles of intersectionality by considering the experiences of people of different genders, age, and socioeconomic situations?
2. How can we collaborate with European stakeholders to enable the African health workforce diaspora to boost African healthcare capacity?
3. How can we develop sustainable capacity for digital health governance and oversight?
4. What can be done to bridge the digital gap for women and girls while leveraging ICT for health sector development?
5. How can Africa collaborate with Europe and share experiences in building health data protection and standards?
6. What is the potential of the AU's flagship 'African Passport and Free Movement of People' project to free up the movement of health workers across the continent?
7. What can be learned from the European Healthy Cities Network to promote healthy urban planning?
8. What is the best way to expand the public-private healthcare market in SSA?
9. How can an inter-regional network be constructed for research into healthcare and climate change?
10. What can be learned from phased national health insurance implementation in European countries?

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