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INSTITUTE

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FINANCIAL INNOVATIONS LAB®

Financing Global Early Warning Systems

Country Case Study: Kenya

INTRODUCTION

Since 2020, the Milken Institute has promoted collaboration to develop and improve early warning systems (EWS) for pandemic preparedness and health security, convening experts and stakeholders to outline a vision for a global early warning network, as well as key considerations for governance, data, and financing. The early warning network would predict, detect, and monitor potential infectious disease outbreaks through cross-sector coordination, data collection, and data analysis, identifying unusual patterns or upticks in key indicators to prevent or mitigate disease spread.

Expanding local, national, and regional EWS and enabling them to interact beyond their silos, with a global network, will require ongoing commitment and funding from the public, philanthropic, and private sectors. A 2022 World Bank/World Health Organization (WHO) analysis of funding needs for surveillance, collaborative intelligence, and early warning concluded an annual cost of US\$13.3 billion, with an annual \$4.1 billion funding gap.¹

While multiple efforts are underway to bridge the public and philanthropic sectors, the path for private-sector engagement and investment has yet to be clearly delineated. In response, in 2023, the Milken Institute's Innovative Finance team interviewed global stakeholders, hosted a Financial Innovations Lab[®], and organized two working groups to identify innovative financing models that could “crowd in” the private sector into global early warning systems.

Throughout this work, it became apparent that each country's early warning systems hold particular challenges and opportunities that could hinder or facilitate their integration with global early warning capabilities. To gain a more nuanced understanding of these challenges, the Institute conducted in-depth interviews with national and local stakeholders and organized roundtables, with a focus on Indonesia, Brazil, and Kenya.

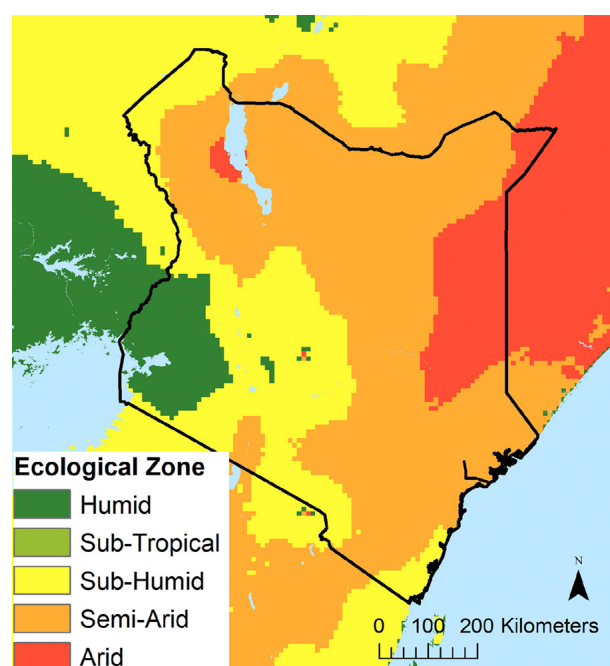
This report summarizes the findings and recommendations from interviews and roundtables focused on Kenya:

- **Provide incentives to the private sector to encourage human and animal health data sharing.** Incentive programs, including low-interest loans and complimentary mobile data packages, could encourage the private sector, such as health clinics and smallholder farms, to share human and animal health data.
- **Mobilize private investment in EWS infrastructure through blended finance mechanisms.** A blended finance fund could use existing donor funding as a risk cushion to attract private investments into EWS infrastructure.
- **Establish collaborations among capital markets regulators, nonprofits, and public health agencies to integrate EWS insights into ESG initiatives.** As the emphasis on ESG risks intensifies, demand for EWS data and insights will likely surge, which could prompt investors, regulators, companies, and rating agencies to pay nonprofit organizations and companies for their EWS data and encourage more proactive EWS activities within these organizations.

COUNTRY BACKGROUND

Kenya, home to 55 million people and multiple climate zones, faces escalating health challenges due to climate change. In the hot and dry northern regions, severe droughts have forced people and animals to crowd around scarce water sources, increasing the spread of waterborne diseases like cholera and dysentery. In contrast, in warm and humid western and coastal areas, erratic rainfall and rising sea levels have resulted in frequent floods that have created breeding grounds for malaria-carrying mosquitoes, endangering 70 percent of the Kenyan population.

Figure 1: Ecological Zones in Kenya



Source: Milken Institute (2024), adapted from *Analysis of a Short-Term and a Seasonal Precipitation Forecast over Kenya*²

Kenya's economic output primarily relies on its shared environment with animals and is entrenched in the everyday lives of most of its population. Agriculture comprises approximately 33 percent of the country's GDP, with livestock alone contributing 40 percent of the sector and backing millions of Kenyans' livelihoods.³ In fact, according to a 2019 study in Western Kenya, 93 percent of households owned at least one type of livestock.⁴ The close interaction between humans and livestock further elevates the risk of zoonotic diseases.⁵

Like many countries, Kenya experienced a significant economic slowdown during the COVID-19 pandemic. Kenya's extensive aviation connections throughout Africa, Europe, and Asia make Kenya one of the fastest-growing economies in Africa. The tourism sector, one of Kenya's major industries and source of foreign exchange earners, experienced a \$1 billion loss in revenue in 2020.⁶ Additionally, the pandemic had critical socioeconomic consequences for Kenya's population, leading to unemployment, food insecurity, and disruptions in education.⁷

Kenya has a robust financial sector, with the "deepest and most sophisticated" capital markets in East Africa.⁸ Kenya has 12 of the top 20 public companies in East Africa, including the telecommunications giant Safaricom and many leading banking and consumer goods companies.⁹ Kenyan institutional investors dominate East African capital markets, with pension funds allocating between 18 percent and 28 percent of their portfolios to listed equities, in contrast to insurance companies, which invest up to 3 percent.¹⁰ Kenya's venture capital ecosystem is particularly advanced, making it one of Africa's top early-stage investment destinations.¹¹

In 2010, Kenya initiated a devolution, transferring significant responsibilities and resources from the central government to 47 newly formed county governments.¹² This constitutional reform altered the country's health-care landscape, allowing local governments to better manage health services and

tailor health-care programs to address regional complexities. However, effectively managing the national budget allocated to counties and ensuring the delivery of consistent public health services has been challenging for local governments.¹³



CURRENT STATE OF EARLY WARNING AND DISEASE SURVEILLANCE IN KENYA

In addressing the growing threat, Kenya has made significant strides in tackling disease outbreaks by investing in local capacity and infrastructure, demonstrating a forward-thinking approach to public health and ecosystem protection. A key part of this effort is the adoption of the “One Health” strategy, a collaborative initiative to improve the health of people, animals, and the environment. This effort is led by Kenya’s Ministry of Health (MoH) and the Kenya Medical Research Institute, with support from international partners like the US Centers for Disease Control and Prevention.¹⁴

Building on this foundation, in 2012, Kenya established the Zoonotic Disease Unit (ZDU), a government entity dedicated to implementing the One Health approach. ZDU is linked to and financially supported by the MoH and the Ministry of Agriculture, Livestock, and Fisheries. More recently, Kenya has been using electronic reporting systems; for example, several counties pioneered a mobile application known as the Kenya Animal Biosurveillance System to facilitate web-based, real-time animal disease reporting.¹⁵

Kenya has been progressively enhancing its public health surveillance systems, moving from manual reporting to a desktop-based system in 2008, and then to a standalone web-based electronic Integrated Disease Surveillance and Response system in 2011. In 2016, the country migrated to District Health Information System 2 (DHIS2), which allows county and national surveillance officers to access and monitor data across different health programs. To facilitate the transition, the Kenya MoH trained focal persons and surveillance officers across sub-county, county, and national levels to improve the completeness and timeliness of reporting.¹⁶

Since 2019, Kenya has piloted an event-based surveillance system as a complementary early

warning system to traditional surveillance systems. The system empowered community health volunteers and members to play a pivotal role in the early detection of human and animal health threats. During the COVID-19 pandemic, the MoH initiated hospital event-based surveillance to capture signals related to COVID-19 and other potential disease outbreaks.

In 2022, the MoH devised a national strategy to strengthen its genomic surveillance capacity, with plans to establish a National Whole Genome Sequencing Consortium for current and future pandemics.¹⁷ Meanwhile, governments, researchers, and companies in Kenya are using sewage wastewater and geospatial data to give valuable alerts for potential outbreaks.¹⁸ Despite these strides, several challenges remain, according to a survey of county surveillance officers assessing DHIS2 and key stakeholder interviews.

Inadequate budget allocations from county governments are the biggest hurdle for efficient data reporting.¹⁹ Stakeholders raised concerns about financial constraints in current infectious disease prevention and treatment programs, which rely heavily on donor funding. However, donor support appears to be declining in recent years, and this funding source for early warning activities may not be sustainable in the long run.

Moreover, infrastructure and technology deficiencies, such as the shortage of genomic sequencing equipment in laboratories, outdated health information systems, and limited access to computers and the internet, have hindered efficient early warning data collection, analysis, and transfer in remote areas.

Despite the escalating threat of climate change on emerging diseases, efforts to integrate environmental and health risks are still mostly limited to the health sector. However, the potential for broader involvement from the financial sector and other industries has yet to be explored.



RECOMMENDATIONS

Given this backdrop, the Milken Institute convened a Financial Innovations Lab® in December 2023 to discuss the future of EWS in Kenya and formulate recommendations for partnership models and financing solutions to incentivize private-sector engagement and investment. The event brought together a diverse panel of stakeholders, including policymakers, health specialists, investors, and philanthropic leaders. These discussions are critical in framing a path for companies and investors to contribute to more responsive, effective early warning systems that can adapt to Kenya’s particular challenges and enhance its overall health security. Table 1 outlines the recommendations that emerged from this meeting and stakeholder interviews as well as the potential approaches to mobilize private sector engagement in the strengthening of early warning capabilities in Kenya.

Table 1: Summary of Recommendations and Models for Mobilizing Private-Sector Engagement in Kenya

Recommendation	Models for Mobilizing Private-Sector Engagement
<p>Provide incentives to the private sector to encourage human and animal health data sharing</p>	<p>Animal health surveillance and data analytics platform, Transformational Strategies for Farm Output Risk Mitigation</p> <p>Impact investment fund that provides loans to small clinics, Medical Credit Fund</p> <p>Tech company that lets patients pay for medical services with health data, Snark Health</p>
<p>Mobilize private investment in EWS infrastructure through blended finance mechanisms</p>	<p>Blended finance project, Africa Medical Equipment Facility</p>
<p>Establish collaborations among capital markets regulators, nonprofits, and public health agencies to integrate EWS insights into ESG initiatives</p>	<p>Nairobi Securities Exchange’s ESG Guidance Manual</p>

Source: Milken Institute (2024)

Provide Incentives to the Private Sector to Encourage Human and Animal Health Data Sharing

As Kenya integrates its disease surveillance activities through the One Health strategy, a significant hurdle remains in gathering data from remote areas and unlocking the potential of privately owned data (e.g., animal health records from veterinarians, consumer purchasing histories from pharmacies, and mobility patterns from ridesharing and transportation service companies). Lab participants recommended offering incentives, such as low-cost loans and free mobile data packages to clinics and farms, as a strategy to encourage data sharing from the private sector.

For example, a program could offer low-interest loans to farmers, contingent on their commitments to share real-time livestock health data with DHIS2. This concept could expand upon the groundwork laid by initiatives such as the Transformational Strategies for Farm Output Risk Mitigation (TRANSFORM), a US\$33 million initiative funded by the US Agency for International Development.²⁰ TRANSFORM established an animal health surveillance and data analytics platform and partnered with financial institutions to extend financing to smallholder farmers adopting on-farm biosecurity measures. The provision of low-interest loans could also be used to incentivize farmers to share data on disease syndromes. Additionally, in exchange for submitting their data to Kenya's Animal Bio-surveillance system via its mobile app, farmers could gain valuable insights into trends that would affect their farms.

Similarly, organizations like the Medical Credit Fund in Kenya, which combines loans with capacity building for health-care small and medium-sized enterprises (SMEs), could incentivize local health-care providers or pharmacies to contribute anonymized human health and consumer data in exchange for favorable financing terms. The insights generated from these data could equip health-care SMEs to prepare for pandemic-related

business disruptions or allow them to adjust their staffing and supply chains in anticipation of increased demand.

Regarding individual-level data sharing, innovative Kenyan start-ups like Snark Health let patients pay medical service costs by contributing their own health data. With a user base exceeding 4,000, this model facilitates access to affordable health care and presents a new approach for collecting real-time health data directly from individuals. This data exchange could be financially supported by philanthropic donations from foundations or by monetizing the aggregated patient data to companies seeking insights into health trends.

Beyond financial incentives, corporate social responsibility initiatives are another promising avenue to encourage private-sector data sharing. Educating companies in Kenya about the interconnectedness of environmental sustainability, public health, and economic growth can motivate companies to engage in EWS activities that can positively impact community health and their business operations.

For example, considering Kenya's high smartphone penetration, telecommunications companies could achieve their social impact goals by donating mobile data packages or providing grants to pay for or lower cost barriers for mobile phones and data usage. For instance, meat inspectors in Kenya manually record slaughterhouse data in paper-based systems; thus, this data is often underused due to their disorganized and unconsolidated nature. Offering free mobile data packages to agriculture and livestock workers could unlock a wealth of existing animal health data to inform rapid response strategies to emerging zoonoses. A digital solution has already been piloted in which mobile phones replaced paper records for real-time reporting of livestock and wildlife data by slaughterhouse workers, and it showed electronic reporting not only is feasible but also improves the efficiency and accuracy of data collection, leading to a more effective EWS.²¹ In turn, the

telecommunications company could benefit from better health crisis preparedness, manifested in a healthier workforce and a stronger economy.

Mobilize Private Investment in EWS Infrastructure through Blended Finance Mechanisms

A robust early warning system relies on high-quality physical and digital infrastructure, such as labs, equipment, health information systems, data centers, and networks. A blended finance fund combining public- and private-sector capital could help mobilize new sources of capital into building or scaling up EWS infrastructure.

Following the COVID-19 pandemic, investors in Kenya are recognizing the potential for both commercial returns and substantial social impact of investment in the health sector. However, such investment remains nascent in Kenya, primarily due to elevated credit risks and a lack of success stories. In addition, historically high interest rates are increasing borrowing costs for health-care businesses seeking new loans to acquire the necessary infrastructure.²²

To address these barriers, stakeholders suggested establishing a blended finance fund to provide low-interest loans to small laboratories and clinics in Kenya, which are often excluded from traditional bank loans due to the lack of payment history or steady revenue. With the low-interest loan, these labs and clinics could purchase essential disease testing equipment or upgrade their digital health infrastructure, which would, in turn, enable more efficient EWS data collection and sharing at the community level.

Blended finance has successfully bridged funding gaps in Kenya's health infrastructure. A notable example is the International Finance Corporation's launch of the Africa Medical Equipment Facility (AMEF) in 2021. With an initial allocation of US\$150 million for guarantees, AMEF aimed to facilitate up to US\$300 million in loans from local

banks to small and medium-sized health-care providers, lowering their financing costs for medical equipment.²³

Moreover, the proposed blended finance fund offers an opportunity to leverage the existing resources to mobilize private investment into EWS infrastructure. Kenya is one of the top recipients of development assistance for health, receiving US\$1.2 billion and US\$1.1 billion in donor funding to cure infectious diseases in 2021 and 2022, respectively.²⁴

If a portion of the existing donor funding were allocated as concessional capital (low- or zero-interest loans, often with longer repayment periods), it could be used to mitigate the default risks and enhance the attractiveness of such projects to private investors. Should a borrower—a laboratory or a clinic—default, causing the fund to incur losses, the donor funding would act as a buffer, absorbing some of the loss and thus reducing the risk exposure for private-sector investors.

In sub-Saharan Africa, with every dollar of concessional capital, blended finance attracted an additional \$1.8 private investment.²⁵ This multiplier effect would amplify the impact of donor funding and increase domestic resources for health security financing in Kenya.

Stakeholders also recommended several strategies to harness the full potential of a blended finance fund, which includes strengthening collaborations with donor partners and Development Finance Institutions, identifying and quantifying prevailing investment barriers, raising awareness among private investors, and developing impact measurement frameworks to ensure accountability and transparency.

Establish Collaborations among Capital Markets Regulators, Nonprofits, and Public Health Agencies to Integrate EWS Insights into ESG Initiatives

The COVID-19 pandemic, as noted by one of the Lab participants, struck both global and Kenyan capital markets as a “black swan” event—entirely unforeseen by market participants, not factored into scenario analysis, and absent from risk assessment in companies’ financial reports. With the current projection indicating a 28 percent chance of another pandemic within the next decade, there is a pressing need to incorporate the probability and impact of this risk into corporate disclosures, including ESG reports.²⁶ To further serve and guide the growing demand from Kenya’s investor community to quantify ESG-related risk, the Nairobi Securities Exchange published an ESG Guidance Manual in 2021.²⁷ The initiative reflects a broader trend toward integrating ESG factors into investment decisions. As the emphasis on ESG risks intensifies, there will likely be a surge in demand for EWS data to forecast and assess the impact of a disease outbreak on the market and individual companies.

For instance, EWS data could be used to develop key metrics, such as the likelihood of continuing operations during health crises, protocols for employee health and safety, and employees’ access to health care. With such data and metrics, investors can better gauge the potential impact of health crises on companies and their capacity for risk mitigation. Regulators could use EWS insights to make informed decisions for reducing market volatility during pandemics. Moreover, the growing interest in ESG risks could drive rating agencies and the companies they evaluate to procure higher-quality EWS data to refine their risk assessment.

This growing demand for EWS data would prompt investors, regulators, rating agencies, and companies to financially compensate nongovernmental organizations and private

companies for sharing their EWS data and insights. In turn, the continuous payment would enable organizations and companies to deepen their involvement in EWS activities and become more proactive in sharing EWS data and insights.

In December 2023, to further facilitate ESG reporting, the Kenyan Capital Markets Authority (CMA) advocated for adopting technology in ESG data collection.²⁸ These new technologies and guidelines could be utilized to integrate EWS insights into ESG initiatives and could open new avenues for collaboration on EWS activities. For instance, nonprofit health organizations, such as the African Medical and Research Foundation, could enrich the ESG data pool by linking real-time EWS data to CMA’s database, so that CMA could share such data with listed companies and investors.

Moreover, in collaboration with nonprofit organizations to support pandemic-related ESG risk assessment, CMA could offer investor education for capital market participants and professional development programs for government officials. Such training would not only broaden their understanding of health risks and potential impacts on the financial system but also equip them with the skills to incorporate EWS data and insights into comprehensive risk management.

CONCLUSION

Encouraging private-sector involvement through investment and data sharing in EWS is key. Providing incentives such as low-cost loans and free mobile data packages to clinics and farms could promote data sharing from the private sector and unlock a critical source of EWS data. A blended finance fund combining public- and private-sector capital could help mobilize new sources of capital into building or scaling up EWS infrastructure. As awareness grows about the financial implications of ESG-related risks, including those posed by pandemics, stakeholders in Kenyan capital markets might be motivated to pay for EWS data and insights offered by nonprofits and private-sector companies, fostering the implementation of EWS initiatives within these organizations.

ENDNOTES

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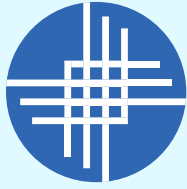
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