

DISEASE DATA

THE GLOBAL INFECTIOUS DISEASES INDEX – AND WHY IT MATTERS

Spotlight
Series

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On its first anniversary, we take a look at the impact of the Global Infectious Disease Index (GIDI) so far, and at the next steps of its evolution, as the world confronts another potential epidemic, this time in the form of the monkeypox virus.



THE ISSUE AT STAKE

→ **IN SEPTEMBER 2021, THE FII INSTITUTE** launched its Global Infectious Disease Index (GIDI),¹ providing valuable information to help health professionals and the general public assess the readiness and vulnerability of global healthcare systems in tackling endemic and emerging epidemic diseases. Since its launch,² GIDI has acquired a reputation as a scientifically rigorous and credible resource, unique in its field, that serves as a transparent metric and a unified source of truth for anyone with an interest in infectious diseases.

WHY HEALTH PROFESSIONALS SHOULD BE USING GIDI

GIDI is primarily a tool to alert policymakers and other stakeholders worldwide to the infectious disease risks and burdens facing global healthcare systems. It can be used to identify countries at risk of endemic and epidemic infectious diseases.

Healthcare is one of the FII Institute's four main priorities (AI and robotics, education, and sustainability are the other three) and it has linked its healthcare strategy to the UN's Sustainable Development Goal 3: "To ensure healthy lives and promote well-being for all at all ages."

During the FII Institute's research, it noticed that one of the reasons infectious diseases spread so quickly was the lack of credible, up-to-date data. Working with partners Metabiota and Accenture, it developed the Global Infectious Disease Index, a tool that captures data about endemic and epidemic diseases in near real time.

LIFE-SAVING DATA AT YOUR FINGERTIPS

The index adopts the novel approach

of globally presenting the burdens of endemic and epidemic infectious diseases. It displays the endemic burden of the five most lethal infectious diseases and combines this with tracking and →



Endemic burden and epidemic threat

FII Institute's Global Infectious Diseases Index consists of two components: the endemic burden index and the epidemic threat index. The endemic index showcases the prevalence of the top five global burden endemic diseases by country. The epidemic index typically tracks outbreaks caused by 20 or more pathogens in near real time, and highlights the threat potential of various epidemic events. The index has been built in collaboration with Metabiota and Accenture.



→displaying the epidemic burden, in near real time, of the most dangerous pathogens globally (GIDI is currently tracking 40 pathogens and 76 epidemics).

THE NEXT GLOBAL THREAT: MONKEYPOX

On 23 July 2022, World Health Organization Director-General Tedros Adhanom Ghebreyesus declared the escalating global monkeypox outbreak a Public Health Emergency of International Concern (PHEIC).³

At the time, 3,040 cases of monkeypox from 47 countries had been reported to WHO. Since then, the outbreak has continued to grow, and there have now been more than 42,000 reported cases and five deaths from 96 countries and territories.

“In light of the evolving outbreak, I reconvened the committee to review the latest data and advise me accordingly,” said the WHO’s Director-General.

The WHO’s assessment is that the risk of monkeypox is moderate globally and in all regions except Europe, where the risk has been assessed as high.

Monkeypox is usually found in rural African areas where people come into close contact with infected rats and squirrels. According to WHO data, the majority of cases of monkeypox continue to be transmitted among men who have sex with men.

Recent cases, however, have occurred in countries where the virus has not previously been seen, and in individuals without a history of travel, indicating that it has likely been

circulating unnoticed for some time.⁴

Professor Adam Kucharski, Co-Director of the Centre for Epidemic Preparedness and Response at London School of Hygiene & Tropical Medicine (LSHTM), has stated,⁵ “I welcome the decision by the World Health Organization to classify this monkeypox outbreak as a public health emergency, and hope it’s accompanied by increased funding and resources to contain outbreaks in non-endemic countries, as well as efforts to support the response in countries where monkeypox has long been a problem.

“Although the disease has generated substantial media coverage in recent weeks, →

Public Health Emergency of International Concern

Under its guidelines, WHO looks for five key pieces of data before deciding whether an outbreak constitutes a Public Health Emergency of International Concern:

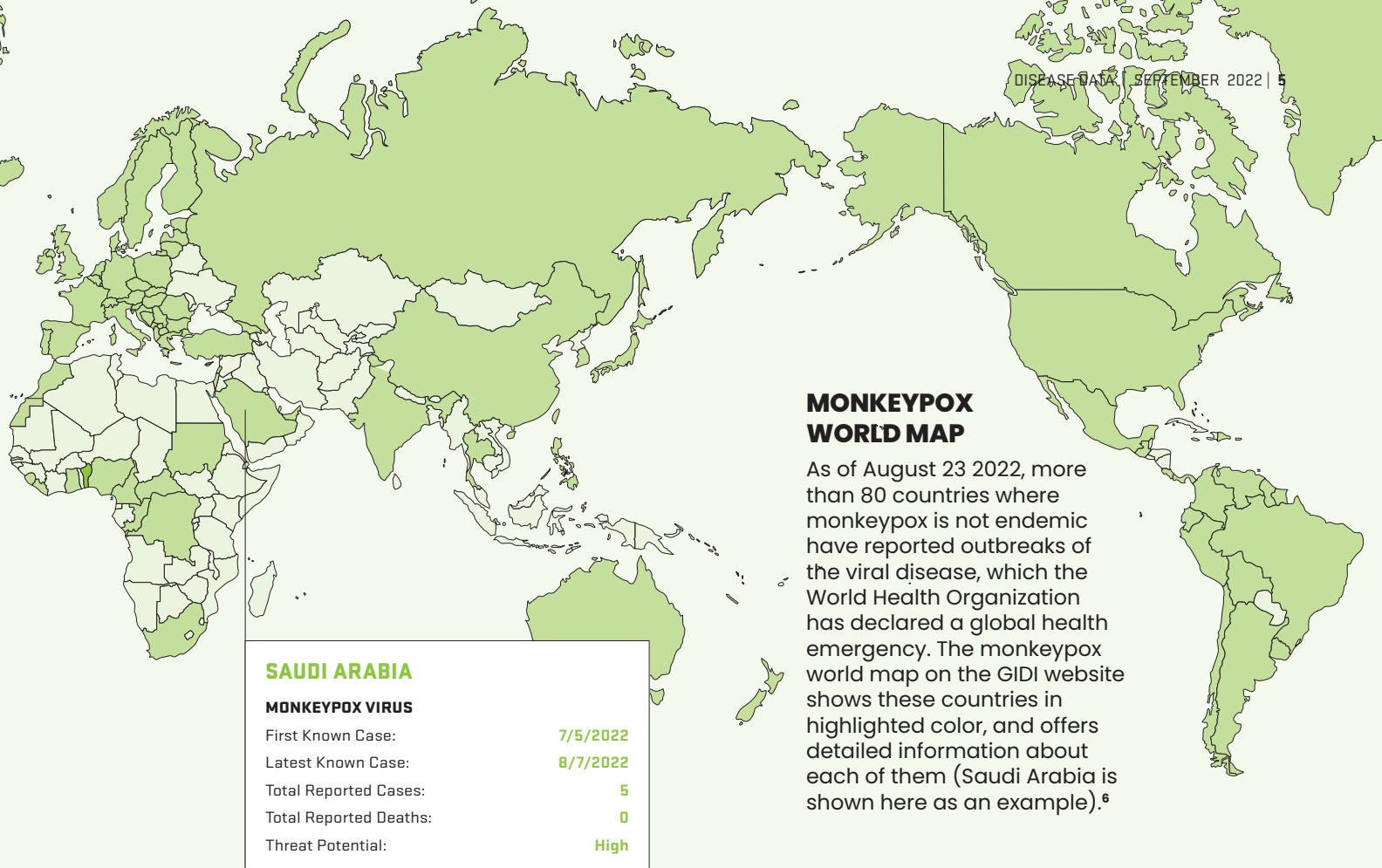
1. The information provided by countries – which in this case shows that this virus has spread rapidly to many countries that have not seen it before
2. The criteria (serious, sudden, unusual, or unexpected), for declaring a Public Health Emergency of International Concern
3. The advice of the Emergency Committee
4. Scientific principles, evidence, and other relevant information
5. The risk to human health, international spread, and the potential for interference with international traffic

MONKEYPOX TIMELINE

The first human case of monkeypox – a rare zoonotic virus that can transmit from animals to people – was recorded in the Democratic Republic of Congo in 1970. Since then, the disease has become endemic in parts of West Africa, although outbreaks have been known to occur in other regions, such as the United States in 2003 and now in over 80 non-endemic countries.

KEY EVENTS IN THE 2022 OUTBREAK





MONKEYPOX WORLD MAP

As of August 23 2022, more than 80 countries where monkeypox is not endemic have reported outbreaks of the viral disease, which the World Health Organization has declared a global health emergency. The monkeypox world map on the GIDI website shows these countries in highlighted color, and offers detailed information about each of them (Saudi Arabia is shown here as an example).⁶

→ it was first reported in the 1970s and has caused outbreaks in Central and Western African populations for decades. It has often been neglected by the international community and funding bodies, despite evidence that one in ten unvaccinated cases are at risk of death from the more severe strain in sub-Saharan Africa. There have been almost 2,000 reported cases in African countries this year alone, with dozens of deaths.

“While the world reflects on weaknesses in the global response to Covid-19, countries are facing a new monkeypox threat that in theory should be much easier to contain – and yet it has not been contained.”

Kucharski said that to bring monkeypox outbreaks under control, health officials must understand where the virus is spreading, which control measures are succeeding and failing in affected communities, and exactly how the current situation differs from earlier outbreaks. And this is where a powerful analytical tool such as GIDI can play a key role in helping health professionals understand and keep track of the emerging threat.

From December 15 2021 to the last update of GIDI on August 23 2022, reported cases were 42,696 and reported deaths were 18.

TRACKING THE MONKEYPOX VIRUS

For the purpose of this paper, we will look at the GIDI's monitoring of monkeypox after the WHO declared it to be a PHEIC. To track→

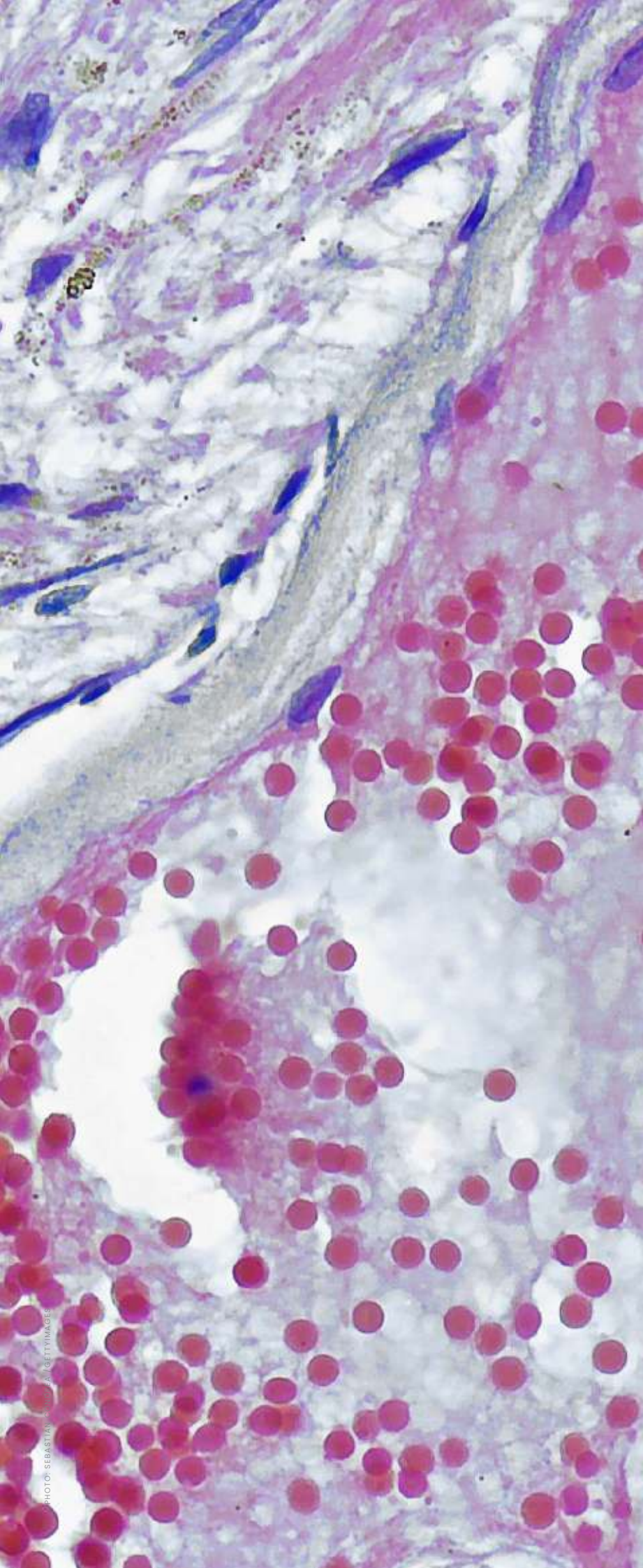
Deep dive into GIDI data

GIDI offers an analytical deep dive into a country's endemic burden level with a unique tool embedded in the platform that leverages insights into the following six rankings: **(1)** number of medical staff, **(2)** number of hospital beds, **(3)** health expenditure, **(4)** population with basic immunization, **(5)** population with basic access to clean water, and **(6)** population with basic access to sanitation.

These criteria help to understand the gaps in each country's readiness to prepare for and win the fight against infectious diseases.

How often is data updated?

- Endemic data: Data are updated on an annual basis, pending the availability of new data from the data sources.
- Epidemic data: These data are updated daily, normally Monday to Friday.
- Country rankings: These are updated on an annual basis, pending the availability of new data from the data sources.
- Country systems data: These are updated on an annual basis, pending the availability of new data from the data sources.



→ infectious disease events, the index uses Metabiota's proprietary infectious disease database for epidemic threats occurring globally in near real time. Data for high-priority outbreaks such as monkeypox are collected, structured, and validated by Metabiota's digital surveillance experts.

The data structuring process is designed to produce the most reliable estimates possible of the distribution of reported cases and deaths over space and time. Metabiota provides a caveat that there may be a delay between when cases and death data are reported and when the epidemic is initially observed.⁷

Events of priority are determined based on the pathogen, countries impacted, endemic status, geographic scale, and severity of the event. Data sources for priority events are evaluated, and those meeting Metabiota quality standards are collected in the outbreak database.

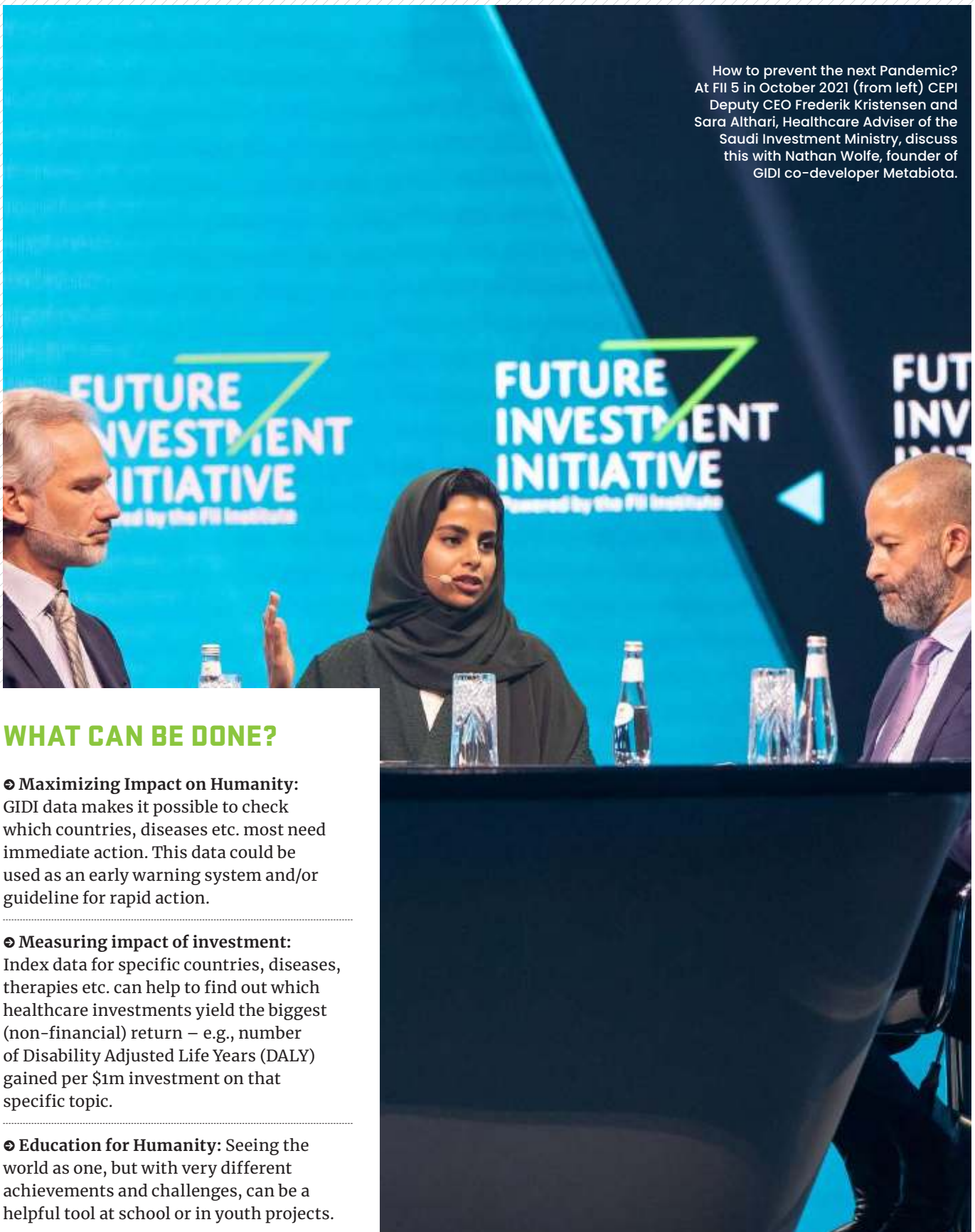
Its near-real-time surveillance for epidemic early warning and monitoring utilizes open source intelligence, covering hundreds of global data feeds. The system starts with event detection, proceeds to assessment and monitoring, and for events that meet specified inclusion criteria designed to screen for events with potentially significant impacts to public health and socioeconomic stability, then feeds into Metabiota's standardized structuring and reporting process.

With the current threat of monkeypox, Metabiota's data feeds collect, structure, and analyze epidemiological data (such as case and death counts) via high-frequency monitoring and curation of epidemic data using open-source intelligence from thousands of data sources. The epidemic data are continuously updated by monitoring, collecting, and cataloging information on outbreaks, in near real time on a daily cadence.

GIDI AS PART OF A GLOBAL RESPONSE TO MONKEYPOX

In response to the outbreak, the European Medicines Agency (EMA) has announced that the remit of its Emergency Task Force (ETF) will be to provide scientific advice and review available scientific data on medicinal products that have the potential to address the emergency.⁸ The value of GIDI is that it can be used as a starting-point for the implementation of measures intended to track and contain the disease. ←

How to prevent the next Pandemic?
At FI 5 in October 2021 (from left) CEPI Deputy CEO Frederik Kristensen and Sara Althari, Healthcare Adviser of the Saudi Investment Ministry, discuss this with Nathan Wolfe, founder of GIDI co-developer Metabiota.



WHAT CAN BE DONE?

➤ Maximizing Impact on Humanity:

GIDI data makes it possible to check which countries, diseases etc. most need immediate action. This data could be used as an early warning system and/or guideline for rapid action.

➤ Measuring impact of investment:

Index data for specific countries, diseases, therapies etc. can help to find out which healthcare investments yield the biggest (non-financial) return – e.g., number of Disability Adjusted Life Years (DALY) gained per \$1m investment on that specific topic.

➤ Education for Humanity: Seeing the

world as one, but with very different achievements and challenges, can be a helpful tool at school or in youth projects.

ABOUT FII INSTITUTE

→ **THE FUTURE INVESTMENT INITIATIVE (FII) INSTITUTE** is a new global nonprofit foundation with an investment arm and one agenda: Impact on Humanity.

Global, inclusive and committed to Environmental, Social and Governance (ESG) principles, we foster great minds from around the world and turn ideas into real-world solutions in four critical areas: Artificial Intelligence (AI) and Robotics, Education, Healthcare, and Sustainability. We are in the right place at the right time: when decision-makers, investors and an engaged generation of youth come together in aspiration, energized and ready for change.

We harness that energy into three pillars: THINK, XCHANGE, ACT. Our THINK pillar empowers the world's brightest minds

to identify technological solutions to the most pressing issues facing humanity. Our XCHANGE pillar builds inclusive platforms for international dialogue, knowledge-sharing and partnership. Our ACT pillar curates and invests directly in the technologies of the future to secure sustainable real-world solutions. Join us to own, co-create and actualize a brighter, more sustainable future for humanity. ←



Contact

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