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Perspective

The Inequality–Pandemic Cycle — Rethinking Preparedness

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We are in a new era of pandemics. Over past millennia, millions of people died from infectious diseases, with few tools for stopping deadly pathogens. Today, we have

science that previous generations would have considered miraculous — Nobel Prize–winning vaccines, precision antiretrovirals, genomic surveillance systems that can sequence a new pathogen within hours. Yet major outbreaks have become more frequent: Ebola, severe acute respiratory syndrome (SARS), Middle East respiratory syndrome (MERS), mpox, and more. The largest outbreaks have killed tens of millions of people — at least 44 million have died of AIDS, and 15 million to 18 million died during Covid-19's first 2 years.¹

The dominant model of pandemic preparedness has focused on technical capacities: stronger

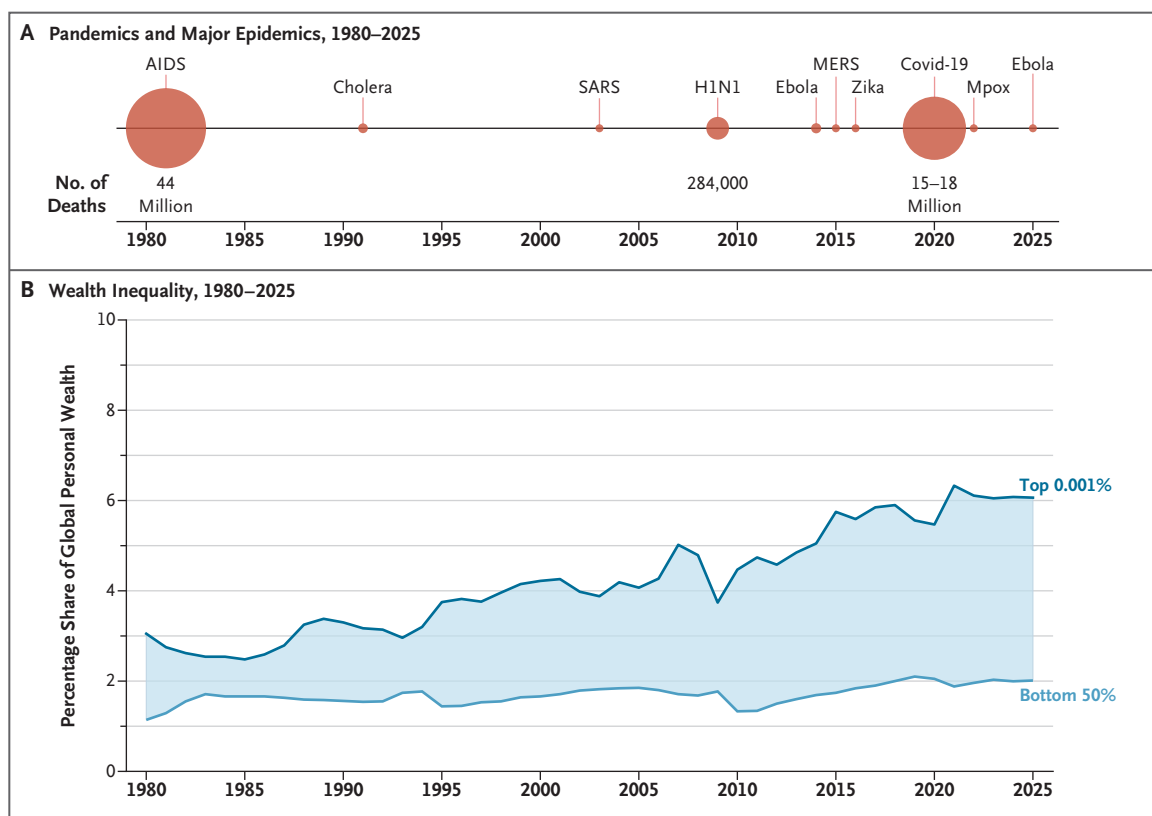
laboratories and surveillance, more effective vaccines and medicines, faster emergency response. Yet in real-life pandemics, some of the most “prepared” countries have mounted the most ineffectual responses. Among the officials and experts charged with stopping pandemics, the current understanding of what drives pandemic risk for the world is proving to be insufficient. The missing element, we believe, is inequality.

This era of pandemics has also been an era of high and increasing economic inequality. Since the 1980s, when AIDS first became pandemic, the world has grown many times wealthier, but the distribution of wealth and income

within countries has grown more unequal (see figure). The very wealthiest sliver of people now control several times more wealth than the less wealthy half of humanity. Today, more than 90% of the world's population lives in countries with economic inequality levels considered to be high according to global standards.² Gaps among countries have narrowed, but global inequality remains stark: average per capita national income in the United States is about 15 times that in Africa. These economic inequalities intersect with, and reinforce, inequalities along lines of race, ethnic group, gender, and sexual orientation.

The co-occurrence of increasing pandemic frequency and increasing inequality is not coincidental — it reflects a self-reinforcing cycle: inequality makes outbreaks more likely to become pandemics,

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An Era of Increasing Economic Inequality and Pandemics.

Mortality data (Panel A) are from the World Health Organization and the U.S. Centers for Disease Control and Prevention. Data on global wealth shares (Panel B) are from the World Inequality Database. SARS denotes severe acute respiratory syndrome, and MERS Middle East respiratory syndrome.

then drives their severity and duration, while pandemics deepen inequality, making future outbreaks harder to control and fueling the next cycle.

Standard concepts of preparedness have not held up well during real-world pandemics. Studies have found no association between preparedness measures and outcomes.³ Some of the countries considered to be most prepared have performed most poorly. The United States ranked highest on the Global Health Security Index, received top-tier evaluations from the World Health Organization's Joint External Evaluations, and was categorized among the "least vulnerable" on the Infectious Disease Vulnerability Index. Yet U.S.

Covid death rates were more than twice the global average, and HIV incidence remains high.¹ Vietnam, Mauritius, Uruguay, Ethiopia, and even Norway all had lower preparedness rankings but fared better during Covid.

Whereas preparedness measures have not predicted countries' degree of success in limiting the toll of pandemics, inequality has: at subnational, national, and cross-national levels, we have found that greater economic inequality predicts worse pandemic outcomes. Inequality is associated with Covid mortality and infection rate, HIV incidence, and AIDS-related deaths, whereas both global health security indicators and overall poverty level are not.⁴ The countries

that were most prepared according to global health security standards had laboratories, stockpiles, and protocols — but many struggled to mobilize those resources for effective response in the context of high and rising inequality.

Identifying the inequality–pandemic cycle is key to building a new, actionable understanding of what it means to be "prepared." Inequality creates conditions in which viruses spread more easily, pandemics last longer, and their human and economic costs mount. On the basis of both peer-reviewed and gray literature on Covid-19, HIV/AIDS, tuberculosis, SARS, influenza, and Ebola,⁵ we can identify four mechanisms by which inequality is fueling pandemics:

within-country social determinants; visibility, governance, and trust; between-country inequalities in international financing; and unequal access to science.

Social determinants of pandemics — conditions in which people are born, grow, live, and work — shape vulnerability in ways that medicine cannot fully offset. Social determinants lead to health inequities in normal times, leaving some populations more exposed to infectious diseases. When a pandemic occurs, certain social conditions fuel infection. Covid-era social distancing and stay-at-home directives, for example, assumed that all people could distance themselves from others. But for people living in overcrowded housing in England or South Africa, or facing impossible choices between feeding their family and staying home in Zimbabwe or India, having limited options undermined the efficacy of public health policies. Essential workers faced high risk, often with little power to enforce safe conditions. And groups that are stigmatized or criminalized owing to racism and discrimination are often deterred from seeking care for Covid or AIDS. More transmission means deeper pandemics.

Inequality also contributes to pandemics by affecting visibility, governance, and trust. In highly unequal societies, some communities become invisible to public health institutions: where key populations are criminalized or undercounted, HIV responses are less effective. In Singapore, an undetected Covid outbreak among migrant workers in crowded dormitories — missed by an otherwise robust testing effort — led to a national surge. In the Democratic Republic of Congo, thousands

of mpox cases diagnosed locally failed to trigger an international response for months. Inequality also erodes institutional trust. As politically motivated denial of Covid's seriousness undermined public confidence, Brazil recorded some of the world's highest death rates, despite ranking as Latin America's most prepared country. Kenya, with less official capacity but strong community structures originally developed for its HIV response, fared better.

At the international level, unequal “fiscal space” — a country's capacity to mobilize funds — drives asymmetric timeliness of and capacity for response. As Covid overwhelmed health systems, high-income countries spent trillions of dollars on pandemic response and worker support, while low-income countries spent far smaller portions of their much smaller gross domestic products. This pattern is not new: during the 2014 Ebola outbreak, constrained fiscal capacity in Guinea, Liberia, and Sierra Leone allowed a manageable regional outbreak to reach three continents. Such outcomes reflect structural imbalances in the global financial architecture: amidst Covid, low- and middle-income countries spent much more on debts to high-income-country creditors than they received in global health funding. Recent cuts to aid deepen the gap.

International inequality in access to science also drives pandemic duration and death tolls. Covid messenger RNA vaccines were developed in less than a year, long-acting antiretrovirals prevent HIV with twice-yearly injections, vaccines for Ebola and tuberculosis are in late-stage trials — yet unequal distribution limits their

impact. Even after effective anti-retrovirals were developed for HIV/AIDS, millions of deaths and millions more avoidable infections occurred in Africa because medications remained expensive and scarce for nearly a decade.

During Covid, high-income countries had enough vaccine doses to reach high-priority populations within 6 months, whereas most low-income countries had not even started vaccinating by that point. More equitable distribution could have prevented millions of deaths and possibly averted the emergence of dangerous variants that extended the pandemic for all countries. The barrier was not a lack of scientific or manufacturing skill: Indian manufacturers showed that antiretrovirals could be made for 1% of the price of the original brand-name drugs; African partnerships demonstrated that Covid vaccines could be reverse-engineered and produced at scale on the continent. The barrier was global rules protecting monopolies at the expense of technology sharing. Unequal access to science costs lives and fuels infections worldwide.

In the other direction, pandemics widen gaps within and between countries. An International Monetary Fund analysis of two decades of major outbreaks — H1N1 influenza, SARS, MERS, Ebola, and Zika — showed persistent increases in income inequality after each outbreak, peaking 5 years later.⁵ During Covid, hundreds of millions of people were pushed into poverty; informal workers and women absorbed disproportionate losses of employment and income. Even as billionaires grew their wealth substantially — capturing a larger proportion of global wealth than

Examples of Inequality-Informed Pandemic Preparedness.

Addressing Social Determinants

- Surge social protection during outbreaks (e.g., expanded unemployment insurance, paid sick leave, direct cash transfers) so people can follow public health guidance without impossible trade-offs.
- Integrate finance, labor, and education ministries, not just health, in national pandemic preparedness planning.
- Make long-term investments in housing, education, and labor to build population resilience before the next outbreak.

Strengthening Visibility, Governance, and Trust

- Establish multisectoral governance bodies involving government ministries, community organizations, rights groups, and scientific leadership, drawing on lessons from national AIDS councils.
- Embed community-led organizations in pandemic response and governance to reach people who are poorly served by mainstream services.
- Include measures of capacity of community-led organizations as pandemic preparedness indicators.

Reforming the International Financial Architecture

- Create a sovereign debt-suspension mechanism for distressed nations during pandemic emergencies.
- Establish automatic International Monetary Fund special drawing rights allocations triggered by pandemic declarations.
- Expand pandemic lending facilities, including involvement of institutions of the Global South such as the BRICS New Development Bank.

Ensuring Equitable Access to Pandemic Science and Technologies

- Establish a global prize fund for pandemic technologies — paying developers up front rather than under patent monopolies — enabling production to be undertaken anywhere.
- Require open licensing for publicly funded biomedical research with pandemic relevance.
- Expand regional manufacturing capacity for cutting-edge medicines and vaccines for today's major diseases, such as tuberculosis and HIV, that can be repurposed in a pandemic.

before the pandemic — rates of food insecurity doubled in the rest of the world. Covid caused one of the largest single increases in global inequality in decades.²

A new, inequality-informed approach to pandemic preparedness is both warranted and practical. Each of the four mechanisms by which inequality drives pandemic risk can be addressed, with immediate measures during active outbreaks and longer-term investments that reduce vulnerability before the next one arrives. Examples in each domain are outlined in the box.

There will be another pandemic — the only question is when. When it arrives, a preparedness model informed by a recognition of the extent and effects of inequality could steer it toward a less deadly and disruptive path, helping to realize at last the promise of decades of breathtaking scientific innovation to stop the cycle of outbreaks.

In addition to the authors, the Global Council on Inequality, AIDS, and Pandemics (<http://www.inequalitycouncil.org>) includes John E. Ataguba, Helen Clark, María Fernanda Espinosa Garcés, Adeeba Kamarulzaman, Ingrid T. Katz, Ruth Laibon Masha, Richard Lusimbo, Rovshan Muradov, Javier Padilla Bernáldez, Mathume Joseph Phaahla, Erika Placella, Achal Prabhala, Peter Sands, Chadchart Sittipunt, Nísia Trindade, and Imraan Valodia. The Council is housed at the Joint United Nations Program on HIV/AIDS and the Georgetown University Center for Global Health Policy and Politics. Additional information about the Council members is provided in the Supplementary Appendix, available at NEJM.org.

Disclosure forms provided by the authors are available at NEJM.org.

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