GLOBAL HEALTH EMERGENCIES, PANDEMIC PREPAREDNESS & GLOBAL HEALTH GOVERNANCE

Ebola Outbreak (DRC-Uganda 2025) | Bundibugyo Virus | WHO PHEIC | Health Equity | USAID Rollback | India's Pandemic Preparedness

GS Paper II (Health, Governance) | GS Paper III (Science & Technology) | GS Paper II (IR) | Essay

01. Key Terms and Explanations

Understanding the vocabulary of global health emergencies is half the battle in both the examination hall and in real-world policymaking. The Ebola-DRC-Uganda crisis of 2025 introduced and re-activated a cluster of terms that appear repeatedly in UPSC mains, GS-2, GS-3, and the Essay paper.

A. Core Epidemiological and Biological Terms

- **EVD is a severe, often fatal illness caused by Ebolavirus, a member of the Filoviridae family. Infection occurs through direct contact with bodily fluids — blood, vomit, sweat, saliva — of infected humans or animals. It is not airborne. The disease progresses from fever, fatigue, and muscle aches to haemorrhaging and multiple organ failure. Case fatality rates range from 25–90% depending on the species and healthcare access available.** Ebola Virus Disease (EVD):
- **One of six known species of Ebolavirus, first identified during a 2007 outbreak in Bundibugyo District, Uganda. Crucially, no approved vaccine or therapeutic exists for this species. The GeneXpert diagnostic platform — the standard rapid-test infrastructure built for the Zaire Ebolavirus — cannot detect Bundibugyo, meaning existing outbreak-response toolkits are partially blind in this scenario. This creates a diagnostic gap with serious public health consequences.** Bundibugyo Ebolavirus:
- **The most lethal and historically most prevalent species, responsible for the catastrophic 2014–16 West Africa outbreak (over 11,000 deaths). Approved vaccines (rVSV-ZEBOV / Ervebo) and therapeutics (mAb114, REGN-EB3) exist for this species, giving responders tools they simply do not have for Bundibugyo.** Zaire Ebolavirus:
- **The moment when a pathogen jumps from its animal reservoir — typically fruit bats for Ebola — into the human population. Genomic sequencing can help determine whether a new outbreak represents a fresh spillover from nature (implying the animal reservoir remains active) or sustained human-to-human transmission from a prior case. In the 2025 outbreak, genomic data suggested a new spillover, signalling both continued reservoir pressure and a possible gap in ongoing environmental surveillance.** Spillover Event:
- **A mathematical measure of how many secondary infections arise from one infected individual in a fully susceptible population. For Ebola under normal conditions, R0 is estimated between 1.5–2.5 — lower than measles (R0 ~15) or COVID-19 Delta (~7). However, R0 is heavily context-dependent; in conflict zones with displaced populations and weakened health systems, effective transmission can climb sharply above these baseline figures.** Basic Reproduction Number (R0):

- **For Ebola, this is 2 to 21 days. During incubation, a person can travel across borders, enter cities, and interact socially without symptoms, creating a window for undetected geographic spread — precisely what happened with cases appearing in both Kinshasa and Kampala before outbreak boundaries were mapped.** Incubation Period:

B. Institutional and Policy Terms

- **Defined under the International Health Regulations (IHR, 2005) as 'an extraordinary event which is determined to constitute a public health risk to other States through the international spread of disease and to potentially require a coordinated international response.' A PHEIC is WHO's highest formal alert, sitting one level below a pandemic declaration. Critically, a PHEIC triggers legal obligations on WHO member-states to report, cooperate, and share information — although enforcement remains weak. Past PHEICs include H1N1 (2009), Ebola West Africa (2014), Zika (2016), COVID-19 (2020), and Mpox (2022, 2024).** Public Health Emergency of International Concern (PHEIC):
- **A legally binding international instrument adopted by 196 countries under WHO's Constitution. It governs how countries detect, report, and respond to potential public health emergencies of international concern. It requires nations to develop core surveillance and response capacities — but lacks a robust compliance or enforcement mechanism. The IHR were significantly amended in 2024 following COVID-19 lessons, strengthening pandemic prevention, preparedness, and response obligations.** International Health Regulations (IHR) 2005:
- **The use of pathogen genome sequencing to track disease spread, identify mutations, trace transmission chains, and differentiate between new spillovers and ongoing outbreaks. In the 2025 Ebola outbreak, both DRC and Uganda published the Bundibugyo genome sequence within four days of the PHEIC declaration — a marked improvement over historical norms. Rapid genomic data-sharing accelerates vaccine and therapeutic development and enables better epidemiological modelling.** Genomic Surveillance:
- **A polymerase chain reaction (PCR) diagnostic platform developed by Cepheid, widely deployed across Africa for rapid diagnosis of tuberculosis and, later, Ebola (Zaire species). Its inability to detect Bundibugyo Ebolavirus exemplifies the broader problem of pathogen-specific diagnostic infrastructure — investments made for one enemy become liabilities when a close cousin emerges.** GeneXpert:
- **The percentage of tests conducted that return a positive result. A high TPR — especially when overall testing volume is limited — strongly suggests that many cases are going undetected; the population of detected cases is a small, heavily symptomatic fraction of total infections. This metric was a central warning signal in the 2025 outbreak, suggesting widespread community transmission preceding detection.** Test Positivity Rate (TPR):
- **A framework that recognises the interconnection between human health, animal health, and environmental health, advocating joint surveillance and response across these three domains. Since Ebola originates in animal reservoirs (probably fruit bats), sustained One Health surveillance — including wildlife monitoring, veterinary reporting, and environmental sampling — is critical for early warning. This approach is now central to India's National One Health Mission and is directly relevant to APSC questions on Northeast India's biodiversity and zoonotic disease risks.** One Health Approach:
- **The primary U.S. government foreign assistance agency. Historically, USAID worked alongside CDC and WHO in funding, staffing, and operationalising outbreak response across Africa and Asia, including deploying field epidemiologists and financing health**

system strengthening. The Trump administration's 2025 decision to effectively dissolve USAID represents the largest single withdrawal of peacetime public health financing in global health history. USAID (United States Agency for International Development):

C. Northeast India / APSC-Specific Lens

- **Northeast India's rich forest ecosystems and biodiversity create conditions for potential zoonotic spillovers. The region hosts fruit bat populations (natural Ebola reservoirs), and cross-border trade with countries like Myanmar, Bhutan, and Bangladesh adds vectors for disease introduction. APSC candidates must connect global health governance frameworks to Northeast India's unique exposure profile.** Zoonotic Disease Risk in Northeast India:
- **Launched under the Union Budget 2021–22, this mission aims to integrate human, animal, and environmental health surveillance. For Assam, a state at the crossroads of South and Southeast Asia, the mission is particularly relevant given its exposure to zoonotic diseases, migratory bird routes, and cross-border animal trade.** National One Health Mission (India):

02. Main Arguments and Substantive Parts

The 2025 DRC-Uganda Ebola outbreak, taken as a whole, functions as a stress test of the entire architecture of global public health — and it reveals structural fractures that go well beyond virology. The arguments that emerge from this crisis can be clustered into five interconnected theses.

Thesis 1: The Pathogen Outpaced the Diagnostic and Therapeutic Infrastructure

- **The Bundibugyo species — not the Zaire species for which the world's Ebola response tools were developed — was responsible. This illustrates a recurring structural vulnerability: the world tends to build response capacity for the last outbreak, not the next one. Diagnostic kits, trained responders, stockpiled vaccines, and even surveillance protocols were calibrated for Zaire; Bundibugyo exploited the gap.** The choice of pathogen mattered enormously.
- **The GeneXpert platform, which is the backbone of field-level molecular diagnosis in sub-Saharan Africa, returned false negatives for the Bundibugyo species. Without confirmation, health workers and policymakers could not mobilise the outbreak response machinery. This lag likely accelerated community spread, as suspected cases were not isolated, contacts were not traced, and chains of transmission lengthened.** Delayed detection was partly the product of wrong tools.
- **When the visible tip of the epidemiological iceberg is already producing 139 deaths and 600+ suspected cases, and modelling suggests many more undetected infections, the true burden is far more severe. This pattern — visible mortality underpredicting total spread — was seen in Ebola West Africa (2014), COVID-19 (2020), and is now repeating.** High test positivity with limited testing volume suggests a large iceberg of undetected cases.

Thesis 2: Structural Conditions Amplified the Outbreak

- **The DRC has been in a state of ongoing armed conflict for decades. The presence of large refugee camps in southwestern Uganda — housing Congolese civilians fleeing the conflict — created densely packed, resource-poor settings where disease surveillance is weak and healthcare access is minimal. Aid cuts mandating that**

displaced people travel farther for food broke the geographic containment that quarantine-based interventions depend on. Conflict and displacement are force multipliers for disease.

- **Healthcare workers are simultaneously the most exposed individuals and the most essential resource for outbreak containment. Their infection creates a feedback loop: fewer workers, worse care, more community spread, more worker infections. The 2014–16 West Africa outbreak demonstrated the devastating effects of health worker mortality on system capacity.** Health worker infections represent a particularly dangerous amplification pathway.
- **Confirmed cases in Kinshasa (DRC) and Kampala (Uganda) — both large, internationally connected cities — signalled that the outbreak had moved from remote rural settings to urban transportation hubs. Kinshasa has direct air connections to Paris, Brussels, and Johannesburg; Kampala to Dubai and Nairobi. The probability of international spread increased qualitatively, not merely quantitatively, with these urban detections.** Cross-border movement and capital city spread changed the risk calculus.

Thesis 3: Genomic Transparency as a Model for Future Preparedness

- **This stands in sharp contrast to historical reluctance — and indeed to India's own incentive structure, where researchers are rewarded for publications rather than for data sharing. The speed of sequence release enabled international researchers to immediately begin work on diagnostics, model outbreaks, and explore therapeutic candidates.** Both DRC and Uganda publicly released the Bundibugyo genome sequence within four days of outbreak announcement.
- **When countries share genomic data rapidly, they enable not just their own response but the entire international system's preparation. This is an argument for both global financing of genomic infrastructure and for normative frameworks — under IHR and beyond — that incentivise data sharing rather than treating it as a competitive or reputational risk.** Cross-border genomic surveillance is a public good that produces externalities far beyond the originating country.

Thesis 4: Global Health Equity Is a Structural Problem, Not an Episodic Failure

- **More people died in Central Africa; more column inches were dedicated to the cruise ship cluster. This asymmetry is not accidental — it reflects the distribution of political voice, media ownership, and economic interest in global health institutions.** The differential media coverage and policy attention between the Andes hantavirus cluster (on a Dutch cruise ship, affecting primarily high-income country nationals) and the far larger Ebola outbreak (affecting low-income populations in DRC and Uganda) is a diagnostic marker of structural inequity in global health attention.
- **USAID's epidemic response teams — the Global Health Security Agenda, the CDC's Global Disease Detection network — brought not just money but epidemiologists, laboratory scientists, and logistics experts who could not simply be replaced by other donors. The loss is qualitative, not merely financial.** The withdrawal of USAID and the U.S. from WHO removes not just funding but irreplaceable technical capacity.

> *Key Insight: Global health security is a non-excludable, non-rival public good. One country's failure to contain a pathogen within its borders creates risk for all others. This is why global health investment is not charity — it is enlightened self-interest. The COVID-19 pandemic demonstrated this with devastating clarity.*

Thesis 5: India's Pandemic Preparedness Requires Structural, Not Just Technical, Reform

- **Academic and research institutions face promotion criteria, funding algorithms, and reputational drivers that incentivise holding data for high-impact journal publications rather than releasing it promptly to public repositories. In an outbreak, this delay can be the difference between a contained cluster and a spreading epidemic.** India's incentive structures reward publications over data sharing.
- **Admitting cases is not a failure of governance — it is the prerequisite for effective response. But in India's political environment, disease admissions are often treated as reputational liabilities by state governments, leading to under-reporting, delayed central reporting, and a resultant gap in real-time situational awareness. COVID-19 exposed this pattern; lessons appear not yet fully internalised.** Politicisation of disease reporting is a governance failure with epidemiological consequences.

03. Historical Evolution of the Issue

The history of global health governance is simultaneously a history of recurring crises and an evolving institutional response to them. Understanding this timeline is essential for UPSC mains — examiners expect candidates to contextualise present crises within long historical arcs.

Period / Year	Event / Milestone	Significance for Global Health Governance
1851	First International Sanitary Conference, Paris	Earliest multilateral effort to coordinate responses to cholera epidemics spreading from Asia. Limited but historically foundational.
1902	Pan American Sanitary Bureau (PASB) established	Oldest existing international health organisation; precursor to PAHO. Set the norm of regional cooperation.
1919–1946	League of Nations Health Organisation (LNHO)	Predecessor to WHO; produced early epidemiological bulletins and standardised nomenclature. Collapsed with the League.
1948	WHO established (7 April — World Health Day)	Foundational moment in global health multilateralism. WHO's Constitution embedded health as a human right for the first time in international law.
1969 (revised 2005)	International Health Regulations (IHR)	Initially covered cholera, plague, yellow fever. Revised post-SARS (2003) to be comprehensive, legally binding, and risk-based rather than disease-specific.
1976	First Ebola outbreaks (Zaire + Sudan simultaneously)	Two species identified almost simultaneously; established Ebola as a high-consequence pathogen. Both outbreaks self-contained due to remote locations.
2000	Bundibugyo-related predecessor outbreaks in Uganda	Sudan Ebolavirus outbreak in Gulu, Uganda; highlighted East/Central Africa as endemic zone.
2003	SARS Epidemic	Game-changer: first outbreak to demonstrate how a respiratory pathogen

		in a hyper-connected world could produce global economic disruption in weeks. Catalysed IHR revision.
2007	Bundibugyo Ebolavirus first identified, Uganda	The 2025 outbreak species identified for first time; WHO and partners recognised its existence but did not prioritise vaccine/therapeutic development for it — a critical preparedness gap.
2009	H1N1 Influenza — First PHEIC	First use of new PHEIC mechanism under revised IHR. Also highlighted problem of over-declaring: vaccine stockpiling by rich nations left low-income countries empty-handed.
2014–2016	West Africa Ebola Epidemic (Zaire species)	~11,000 deaths across Sierra Leone, Liberia, Guinea. WHO criticised for slow PHEIC declaration. Led to formation of WHO Health Emergencies Programme, Coalition for Epidemic Preparedness Innovations (CEPI), and prioritisation of Ebola R&D — all for Zaire species.
2019	Zaire Ebola vaccine (rVSV-ZEBOV / Ervebo) approved by FDA/WHO	First approved Ebola vaccine — but species-specific. Bundibugyo remains without an approved vaccine or therapeutic as of 2025.
2020–2022	COVID-19 Pandemic (PHEIC declared Jan 2020)	Demonstrated catastrophic consequences of delayed response, inequitable access, and the collapse of multilateral health cooperation. Exposed India's public health infrastructure gaps.
2022	Mpox — PHEIC declared twice (2022, 2024)	Successive PHEICs for the same pathogen; raised questions about PHEIC fatigue and the consistency of WHO's threshold for declaration.
2025 (Jan-May)	Trump Administration dissolves USAID	Single largest withdrawal of public health financing infrastructure in post-WWII history. Leaves a vacuum in Africa that no other donor has the capacity to fill immediately.
May 17, 2025	WHO declares PHEIC for Bundibugyo Ebola (DRC-Uganda)	First PHEIC for Bundibugyo species; 139+ deaths, 600+ cases; cases confirmed in both national capitals.

India's Pandemic Preparedness — Historical Arc

- **British colonial public health infrastructure was extractive and reactive — quarantine ports, sanitary commissions, and plague regulations served imperial trade interests rather than population health. The 1897 Epidemic Diseases Act — still on the books in 2020 — was written to suppress public protest, not manage epidemics.** Pre-Independence:

- **National Malaria Eradication Programme, smallpox eradication, and expansion of primary health centres marked India's public health ambitions. However, chronic underfunding (public health spending rarely exceeding 1% of GDP) meant infrastructure remained fragile.** Post-Independence to 1980s:
- **National Disaster Management Act (2005), IDSP (Integrated Disease Surveillance Programme) launched. AIIMS network expanded. Health and Wellness Centres under Ayushman Bharat aimed to strengthen primary care.** 2005–2020:
- **COVID-19 exposed massive gaps in ICU capacity, oxygen supply chains, data transparency, and inter-state coordination. Subsequent investments included ICMR network strengthening, INSACOG (genomic consortium), and the National One Health Mission. However, structural problems — political reluctance to share adverse health data, weak rural surveillance — persist.** 2020–2025:

04. Logical and Philosophical Base

The arguments embedded in this crisis rest on a set of philosophical foundations that UPSC Essay and Ethics paper candidates must be able to articulate clearly. These are not merely abstract positions — they have direct policy implications.

A. Health as a Human Right — Amartya Sen's Capabilities Approach

- **Health is not merely instrumentally valuable (enabling work and productivity) — it is constitutively valuable as part of what it means to live well. This philosophical grounding underpins the WHO Constitution's declaration that 'the enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being.'** Sen's capabilities framework argues that what matters for human freedom and dignity is not just income or utility but the substantive freedom to live a long, healthy life.
- **This is not a failure of individual decision-makers; it is a structural outcome of a world system organised around economic and geopolitical power rather than human need.** The differential mortality between DRC/Uganda (thousands of deaths, minimal global attention) and a cruise ship cluster (few deaths, massive coverage) reflects what Sen called 'capability deprivation' as a structural condition — the people of DRC lack not just vaccines but the political voice and economic weight to command global attention.

B. Rawlsian Justice — The Veil of Ignorance

- **Behind this veil, rational actors would almost certainly choose a global health system that responded to severity of need rather than GDP per capita of the affected population — precisely the opposite of what actually exists. This provides a powerful normative argument for equitable global health financing and attention.** John Rawls' 'veil of ignorance' thought experiment asks: what principles of justice would rational individuals choose if they did not know their nationality, wealth, or position in the global health system?

C. Peter Singer's Global Obligation — Utilitarian Ethics

- **The cost of maintaining USAID's global health programmes is a fraction of the cost — in dollars, deaths, and economic disruption — of a global pandemic. Singer's framework makes the case for global health investment on purely consequentialist grounds, setting aside altruism entirely.** Peter Singer's utilitarian argument holds that if we can prevent something bad from happening without sacrificing anything of comparable moral importance, we are obligated to do it.

D. Epistemic Justice and the Politics of Knowledge

- **The Andes hantavirus cases attracted disproportionate media coverage because the patients were primarily from high-income countries whose citizens' lives are implicitly valued more highly in the global media ecosystem. This is not merely unfair — it actively distorts the public health information environment, directing research, resources, and response to the wrong problems.** Miranda Fricker's concept of 'epistemic injustice' describes how structural inequalities shape whose knowledge is treated as credible and whose suffering is treated as newsworthy.
- **Knowledge generated with public funding belongs to the public; restricting it to maximise individual publication metrics is not just inefficient — it is a form of epistemic injustice toward the communities whose health data was collected, who have a right to the benefits that data can produce.** There is also an epistemic argument for data sharing.

E. Kautilyan Realism and Global Health as National Interest

- **A pandemic that originates anywhere can reach anywhere within days in a hyper-connected world. India's refusal to share disease data or coordinate transparently with WHO does not protect India's reputational interests — it undermines the global early-warning system that is India's own first line of defence against imported outbreaks. Health security and national security are inseparable.** From a Kautilyan perspective, investment in global health is not altruism but rational statecraft.

APSC Angle: Assam sits at the intersection of South and Southeast Asian disease corridors, shares borders with Bangladesh, Bhutan, and Arunachal Pradesh (adjoining Myanmar), and hosts high-density migrant and refugee-adjacent communities. The philosophical argument for transparent disease reporting and data sharing has practical urgency in the Northeast India context that goes beyond abstract ethics.

05. New Features and Unique Ideas

The 2025 Ebola outbreak produced several genuinely novel features in global health practice, alongside proposals for structural change that deserve close analytical attention from UPSC candidates.

A. Rapid Cross-Border Genomic Surveillance — A Genuine Innovation

- **Earlier outbreaks — including the West Africa Ebola epidemic of 2014 — were characterised by months-long delays in sequence sharing, partly due to scientific competition, partly due to institutional inertia, and partly due to sovereignty concerns. The 2025 speed demonstrates that technical and normative barriers can be overcome when political will aligns with institutional design.** The publication of the Bundibugyo genome sequence within four days of PHEIC declaration by both DRC and Uganda is historically unprecedented.
- **It enabled real-time epidemiological modelling to estimate undetected case burden, allowed international partners to begin diagnostic kit development for Bundibugyo-specific detection, supported bioinformatics analysis to confirm a new spillover rather than continued human-to-human transmission, and established a public genomic data record that will support future vaccine and therapeutic R&D.** This speed had immediate practical consequences.
- **The technical infrastructure (sequencing platforms, online repositories like GISAID and NCBI) exists; the primary requirements are political will and international**

financing of genomic laboratory capacity in low-income settings. This is a relatively low-cost, high-return investment in preparedness. The feasibility of this model is high.

B. Species-Agnostic Diagnostic Platforms — A Preparedness Gap Now Identified

- **The proposal that emerges from this crisis is to develop broad-spectrum diagnostic platforms capable of detecting multiple Ebolavirus species — or, more ambitiously, capable of detecting any haemorrhagic fever virus through metagenomic sequencing rather than targeted PCR. Such platforms would be more expensive upfront but dramatically more resilient against pathogen diversity.** The failure of GeneXpert to detect Bundibugyo exposes the inadequacy of pathogen-specific diagnostic investments.
- **India's diagnostic infrastructure has similarly been built around anticipated pathogens; a national diagnostic preparedness strategy that includes broad-spectrum platforms — including for arboviral diseases like Nipah, which has repeatedly emerged in Kerala — would strengthen India's overall health security posture.** India's ICMR and DCGI can draw lessons here.

C. Platform Technologies for Broad-Spectrum Vaccines — The CEPI Model

- **Its '100 Days Mission' — to develop a deployable vaccine within 100 days of a novel pathogen being identified — represents a paradigm shift from reactive to proactive vaccine development. The Bundibugyo crisis tests this model; CEPI's response capacity for non-Zaire Ebolavirus species will be a crucial indicator of whether preparedness investments have been appropriately distributed.** The Coalition for Epidemic Preparedness Innovations (CEPI), launched after the 2014–16 Ebola outbreak, funds R&D for vaccines against emerging pathogens before outbreaks occur.

D. Algorithmic Epidemiological Modelling as an Early Warning Tool

- **In previous decades, estimating undetected burden required weeks of field epidemiology; today, models can produce estimates within days. The challenge is integrating these model outputs into real-time decision-making by health ministries and WHO Emergency Committees without producing false confidence.** The use of computational epidemiological models — fed by genomic data, mobility data, case counts, and test positivity — to estimate undetected infections represents a genuine advance in outbreak situational awareness.

E. Aid Architecture Reform — Diversification Beyond a Single Superpower

- **Proposals under discussion include expanding contributions from G20 middle powers (India, Brazil, South Africa, Indonesia), creating an endowment-style Global Health Security Fund less vulnerable to electoral politics, and strengthening the financing role of the African Union's Africa CDC as a regional complement to WHO's global mandate. India's leadership in this space — given its pharmaceutical manufacturing capacity and its role as the 'pharmacy of the world' — is both an opportunity and a responsibility.** The USAID dissolution has catalysed serious discussion about the structural over-dependence of global health on a single government donor.

06. Sustainability of the Idea

Assessing the long-term viability of the global health governance architecture — and of specific reforms proposed in response to the 2025 Ebola crisis — requires moving across environmental, constitutional, legal, ethical, and societal dimensions.

A. Environmental Sustainability

- **As human populations encroach on previously wild habitats — driven by agricultural expansion, logging, and urban growth — contact between humans and animal disease reservoirs (including fruit bats) increases. The DRC, which holds the world's second-largest rainforest, faces intense deforestation pressure. Globally, modelling suggests that climate-driven range shifts of wildlife will create new contact zones between humans and animal populations carrying novel pathogens.** Climate change and deforestation are expanding zoonotic disease spillover risk.
- **The sustainability of any global health governance architecture depends on whether it is built to handle not occasional crises but a semi-permanent state of heightened zoonotic spillover risk. The current WHO-IHR framework was designed for episodic emergencies; it requires structural adaptation for a world of chronic spillover pressure.** This means the frequency of outbreak events is likely to increase, not decrease, over the coming decades.

B. Constitutional and Legal Sustainability

- **Articles 21 (right to life, interpreted to include right to health by the Supreme Court in Paschim Banga Khet Mazdoor Samity v. State of West Bengal, 1996), 39(e), 41, 47, and 253 (enabling treaties to be implemented) together create a constitutional ecosystem supportive of both domestic health investment and international health cooperation.** India's constitutional framework provides a solid basis for health-as-right jurisprudence.
- **It is a colonial relic that empowers state and central governments to take measures but provides no framework for inter-state coordination, data sharing obligations, or rights of quarantined individuals. A comprehensive Public Health (Prevention, Control and Management of Epidemics, Bio-terrorism and Disasters) Act has been under discussion for years but not yet enacted. This legislative gap is a sustainability risk for India's outbreak response capacity.** The Epidemic Diseases Act 1897 — amended in 2020 to protect health workers from violence — remains inadequate as a framework for modern outbreak management.

C. Ethical Sustainability

- **It produces not just moral failure but practical failure — under-resourced outbreaks in low-income settings are left to grow until they become threats to high-income countries, at which point emergency response is far more expensive than prevention would have been.** A global health system that systematically allocates attention and resources by the income level of affected populations is ethically unsustainable.
- **Low-income countries provide the pathogen sequences and epidemiological data that enable high-income countries to develop vaccines and therapeutics. But the benefits of those products frequently flow disproportionately to wealthy nations (as in COVID-19 vaccine allocation). Sustainable genomic data sharing requires equity mechanisms — pre-negotiated access agreements, technology transfer provisions, and benefit-sharing frameworks — analogous to the Nagoya Protocol for genetic resources.** The ethics of data sovereignty create a genuine tension.

D. Societal Sustainability

- **After COVID-19 generated enormous global disruption, public and political attention to subsequent WHO warnings has diminished. The declaration of a PHEIC for Bundibugyo Ebola in 2025 received less media coverage than Mpox PHEICs in 2022 and 2024, which themselves received less than COVID-19. If PHEICs become routine, the mechanism loses its ability to galvanise response. Maintaining societal alertness**

without producing anxiety requires careful communication strategy. PHEIC fatigue is a real phenomenon.

- **Contact tracing, isolation, and vaccination — the core tools of outbreak response — require voluntary cooperation from affected communities. In both DRC (where armed groups have historically attacked vaccination campaigns) and in India (where vaccine hesitancy was weaponised politically during COVID-19), erosion of community trust is a fundamental sustainability risk.** Community trust in health systems is a prerequisite for outbreak containment.

07. Challenges Related to the Issue

The challenges operating against effective global health governance in the 2025 Ebola crisis are multi-layered. Grouping them analytically helps candidates write structured, comprehensive mains answers.

A. Scientific / Technical Challenges

- **Vaccine development takes 10–15 years under conventional timelines. Even accelerated platforms (mRNA, viral vector) require multiple clinical trial phases. A PHEIC declaration creates urgency but does not instantaneously produce tools. Ring vaccination strategies — which were effective in the 2018–19 DRC Zaire Ebola outbreak — cannot be employed without a working vaccine.** No approved vaccine or therapeutic for Bundibugyo species:
- **GeneXpert's species-specificity means that the most widely deployed rapid diagnostic tool in sub-Saharan Africa is blind to Bundibugyo. Field-compatible Bundibugyo-specific or broad-spectrum diagnostics are not yet commercially available at scale. Developing, validating, and deploying them will take months at minimum.** Diagnostic platform gap:
- **Standard epidemiological models assume known parameters — contact rates, case fatality, serial interval. In conflict zones with displaced populations, these parameters are highly uncertain and rapidly shifting. Model outputs guiding response decisions carry wide confidence intervals, creating decision-making uncertainty.** Modelling uncertainty in conflict settings:

B. Implementation Challenges

- **Both DRC and its border zones are active conflict theatres. Health workers have been killed or kidnapped in previous DRC Ebola responses. The 2018–19 Kivu Ebola response operated in the middle of an armed conflict, dramatically limiting field epidemiology and vaccination coverage.** Conflict and insecurity prevent responders from accessing affected areas:
- **Ebola vaccines require ultra-cold storage. Deploying them to remote communities in eastern DRC — some accessible only by helicopter or river — requires logistics infrastructure that simply does not exist in many affected areas.** Cold chain and logistics in remote settings:
- **With health workers themselves falling ill, the capacity to manage not just Ebola but routine healthcare — maternal health, HIV, tuberculosis, malaria — collapses. This creates compound mortality that goes uncounted in outbreak statistics.** Health worker depletion creates a service delivery crisis:

C. Governance Challenges

- **WHO's emergency response capacity depends on assessed contributions from member states and voluntary contributions from major donors. The U.S. was historically the largest single contributor; withdrawal creates a financing hole that cannot be filled by existing donors without new political commitments.** WHO funding gap post-USAID withdrawal:
- **Countries routinely under-report or delay reporting of potential public health emergencies of international concern, fearing trade and travel restrictions. The IHR has no enforcement mechanism beyond diplomatic pressure and WHO's ability to name and shame non-compliant countries — a weak lever against governments willing to absorb reputational costs.** IHR compliance enforcement is weak:
- **The China-U.S. rivalry, Russia's withdrawal from global health partnerships, and the weaponisation of health data in vaccine diplomacy have eroded the cooperative norms that effective global health governance requires. Each of these is a governance challenge that no technical innovation can solve.** Geopolitical rivalry undermines multilateral cooperation:

D. India-Specific Challenges

- **India's university and research funding systems — based on citation counts and journal impact factors — create strong incentives to delay data sharing in order to publish findings first. This is a structural governance failure, not an individual ethical failure, and requires systemic reform of research evaluation criteria.** Incentive misalignment in research institutions:
- **State governments face electoral consequences for admitting disease outbreaks; central governments face reputational consequences internationally. The result is systematic under-reporting and delayed escalation. Fixing this requires decoupling disease reporting from political accountability — a reform with no obvious political constituency.** Political economy of disease reporting:
- **IDSP (Integrated Disease Surveillance Programme) relies on reporting from health facilities; most zoonotic spillover events occur in communities far from formal healthcare. Community-based surveillance — through ASHAs, veterinary workers, and tribal health volunteers — is underdeveloped, creating persistent blind spots.** Inadequate primary health care infrastructure for surveillance:

08. Multidimensional Analysis

A multidimensional lens is the hallmark of a strong UPSC mains answer. Each dimension below should be treated as a paragraph or sub-section in examination responses on health, governance, and international relations topics.

Social Dimension

- **In DRC and Uganda, the epicentre communities are rural, poor, and in many cases displaced by conflict. They lack access to clean water (critical for basic infection control), have limited literacy (complicating public health messaging), and live in areas where traditional burial practices — which involve direct contact with the deceased — accelerate Ebola transmission.** Ebola disproportionately affects the most socially marginalised populations.
- **In previous outbreaks, survivors have faced exclusion from their communities, loss of employment, and psychological trauma compounded by social rejection. Outbreak response that ignores social reintegration of survivors is incomplete and creates**

disincentives for communities to report cases. Stigma associated with Ebola infection — and with survivors — creates social fractures.

- **Women, who disproportionately provide care — formal healthcare workers and informal home caregivers — bear higher infection risk. Female health workers accounted for a disproportionate share of health worker infections in the West Africa Ebola outbreak. Outbreak response planning that is gender-blind fails to protect the people it most depends on.** Gender dimensions of outbreak response are consistently under-analysed.

Political Dimension

- **This illustrates a structural weakness of global public goods that depend on voluntary contributions from sovereign states: they are always vulnerable to changes in domestic political winds. The architecture of global health cannot be sustainable if it relies on the continued goodwill of any single government.** The USAID dissolution is fundamentally a product of domestic U.S. political dynamics — specifically the 'America First' foreign policy philosophy — being imposed on a global commons with catastrophic consequences.
- **Countries affected by PHEIC declarations face immediate trade and travel restrictions that are disproportionate to actual transmission risk — creating strong political incentives to delay or resist reporting. The IHR's 2024 amendments attempted to delink PHEIC status from automatic trade/travel measures, but implementation remains uncertain.** The PHEIC mechanism has become politically sensitive.
- **This creates a fundamental challenge for national outbreak response: the Centre can coordinate and fund but cannot command state health systems. Inter-state coordination during COVID-19 — especially on oxygen allocation and vaccine distribution — revealed how this constitutional structure can delay unified national response.** In India, health is a State List subject under Schedule VII of the Constitution.

Legal Dimension

- **Key provisions include Article 12 (criteria for PHEIC determination), Article 15 (temporary recommendations following PHEIC), and Article 44 (collaboration and assistance). However, the IHR does not provide a legal basis for WHO to compel member states to share data, accept technical assistance, or implement public health measures.** The IHR 2005 (amended 2024) is the primary legal framework governing international disease reporting.
- **If finalised, it would represent the most significant development in global health law since the IHR revision.** The Pandemic Treaty (Pandemic Accord) negotiations — ongoing since 2021 — aim to create a complementary legal instrument with stronger equity provisions, including benefit-sharing from pathogen samples and guaranteed access to pandemic countermeasures for developing countries.
- **The Epidemic Diseases Act (1897), the National Disaster Management Act (2005), the Environment Protection Act (1986), and the Prevention and Control of Infectious and Contagious Diseases in Animals Act (2009) together cover the field but without coherent integration. A comprehensive Public Health Act remains a legislative priority.** India's domestic health law remains fragmented.

Ethical Dimension

- **It reflects what philosophers call 'moral parochialism': the tendency to weight the suffering of people who are culturally, geographically, or economically proximate more heavily than those who are distant. Global health ethics demands — and global health security requires — moving beyond this parochialism.** The geography of

suffering — where low-income country deaths receive less global attention than high-income country infections — is an ethical failure of the first order.

- **In conflict settings, forced quarantine without food, water, or social support is not just inhumane — it is counterproductive, driving cases underground and destroying community trust. Ethical outbreak response requires that isolation is accompanied by material and social support, not just containment.** The ethics of quarantine and isolation require careful balancing of individual rights against collective protection.
- **When pathogen sequences from DRC communities are used to develop vaccines sold at high prices to rich country governments, the communities that provided the essential raw material receive no direct benefit. This is a form of structural exploitation that must be addressed through pre-negotiated access and benefit-sharing agreements.** Data ownership and benefit sharing raise ethical questions about extractive health research.

International Relations Dimension

- **The COVID-19 pandemic revealed how vaccine nationalism, competing narratives about pathogen origins, and rival health diplomacy programmes (China's vaccine diplomacy vs. COVAX) can fracture the multilateral cooperation that effective outbreak response requires. The 2025 Ebola outbreak operates in the same fragmented geopolitical environment.** Global health has become a domain of geopolitical competition.
- **The African Union's Africa CDC, established in 2017, represents a significant step toward African-owned health governance — but remains under-resourced compared to its mandate. WHO's leadership under Dr. Tedros Adhanom Ghebreyesus (first African Director-General) has advanced some reform, but structural power asymmetries persist.** Africa's centrality to global health security has not been matched by Africa's representation in global health governance.
- **As the world's largest vaccine manufacturer, a G20 permanent member, and a country with growing soft power, India has both the capacity and the strategic interest to play a larger role in global health financing and governance. The 2023 G20 Presidency, held by India, produced a health track focused on One Health and pandemic preparedness — a platform that India can continue to develop.** India's role in global health governance is evolving.

> *APSC Angle: Northeast India's health security is inseparable from its geopolitical context. The region shares borders with Myanmar (where military conflict has displaced populations), Bangladesh (with high population density and ongoing Rohingya displacement), and Bhutan. Cross-border disease surveillance, coordinated with these neighbours through bilateral health agreements and SAARC health frameworks, is an immediate priority for Assam's public health administration.*

Economic Dimension

- **The World Bank estimated that COVID-19 cost the global economy $12–16 trillion. The annual cost of adequate global pandemic preparedness infrastructure is estimated at $20–50 billion per year — a ratio of roughly 300:1 in terms of losses avoided. This makes pandemic preparedness investment one of the highest-return policy choices available to governments.** The economic case for pandemic preparedness is overwhelming.
- **Travel advisories, trade restrictions, and investor flight reduce economic activity. The 2014–16 West Africa outbreak cost Guinea, Sierra Leone, and Liberia an estimated $2.8 billion in GDP — about 12% of combined output. For small, fragile economies, an outbreak can reverse years of development progress.** Ebola outbreaks produce immediate economic disruption far beyond the directly affected region.

- **The USAID dissolution will reduce economic activity in many low-income countries that depended on USAID-funded health programmes not just for disease control but for employment of local health workers, construction of health facilities, and training of national staff. The economic multiplier effects of health aid are significant and frequently underestimated.** Aid architecture redesign has economic dimensions.

09. Linkages with NCERTs

NCERT Book / Class	Chapter / Topic	Relevance to This Module
Biology, Class XII — Ch. 8	Human Health and Disease	Virus structure, immune response, disease classification (communicable vs. non-communicable), vaccination principles — foundational for understanding Ebola biology and vaccine development logic.
Biology, Class XII — Ch. 9	Strategies for Enhancement in Food Production; Ch. 12: Biotechnology	PCR technology, genomic sequencing, recombinant vaccine development — the scientific basis for GeneXpert diagnostics and CEPI-funded vaccine R&D.
Biology, Class XII — Ch. 13	Organisms and Populations; Ecology chapters	Zoonotic disease emergence is an ecological phenomenon — understanding host-pathogen-environment relationships requires ecosystem biology concepts from ecology chapters.
Political Science, Class XII — Ch. 2	The End of Bipolarity; Ch. 4: Alternative Centres of Power	The decline of American leadership in multilateral institutions, the rise of China's health diplomacy, and the role of regional organisations (AU, ASEAN) in filling governance gaps.
Political Science, Class XII — Ch. 6	International Organisations	WHO, UN system, WHO's PHEIC mechanism, IHR, relationship between sovereignty and international health obligations — directly covered in this chapter.
Political Science, Class XI — Ch. 9	Constitution as a Living Document	Judicial interpretation of Article 21 to include right to health; constitutional basis for India's pandemic response measures.
Geography, Class XII — Ch. 3	Human Development	HDI components include health (life expectancy); maps of health inequality between DRC/Uganda and high-income countries contextualise the differential response to outbreaks.
Economics, Class XII	Government Budget and Economy; Macro-economic chapters	Public expenditure on health, health as a public good, market failure in vaccine development (positive externalities, under-provision), role of

		government and international organisations in providing global public goods.
History, Class XI — Themes in World History	Displacing Indigenous Peoples; Colonial Encounter	Colonial legacy in African health systems — underfunding, extractive infrastructure, and the political economy of post-colonial aid dependence are all historical products of colonialism.

10. Linkages with UPSC CSE Syllabus

GS Paper II — Governance, Constitution, Polity, Social Justice, International Relations

- **National Health Mission, IDSP, National One Health Mission, Epidemic Diseases Act amendments, proposed Public Health Act — all directly relevant.** Government policies and interventions for development in various sectors:
- **Universal health coverage, Ayushman Bharat, public health infrastructure gaps, health workforce issues — Ebola response highlights all of these.** Issues relating to development and management of Social Sector/Services relating to Health:
- **India's health diplomacy in South and Southeast Asia, SAARC health frameworks, cross-border disease surveillance with Bangladesh and Myanmar — critical for APSC candidates.** India and its neighbourhood — Relations:
- **WHO, IHR, CEPI, GAVI, G20 health track, Pandemic Treaty negotiations — India's position and interests in each.** Bilateral, regional and global groupings and agreements involving India:
- **USAID dissolution's impact on global health financing and India's own health security; vaccine nationalism in COVID-19 and lessons for future outbreaks.** Effect of policies and politics of developed and developing countries on India's interests:

GS Paper III — Technology, Economic Development, Bio-diversity, Environment, Security

- **mRNA vaccines, PCR/GeneXpert diagnostics, genomic surveillance, CRISPR-based diagnostics — all emerging from the global health emergency response ecosystem.** Science and Technology — developments and their applications and effects in everyday life:
- **INSACOG (India's genomic surveillance network), AI-based epidemiological modelling, bioinformatics for outbreak tracking.** Awareness in the fields of IT, Space, Computers, Robotics, Nano-technology, Bio-technology:
- **Deforestation, zoonotic spillover, One Health approach — the ecological roots of outbreak emergence.** Conservation, environmental pollution and degradation, environmental impact assessment:
- **Conflict-zone health emergencies, cross-border disease spread in Northeast India's border zones, dual-use of biosurveillance infrastructure.** Security challenges and their management in border areas:

GS Paper I — Geography and Social Issues

- **Disease reservoirs (fruit bats, primates) distributed across tropical rainforest ecosystems — overlap with biodiversity hotspots in Africa and Northeast India.** Distribution of key natural resources across the world:
- **Malthusian pressures in DRC, refugee population health, migration-disease nexus — social geography of outbreaks.** Population and associated issues, poverty and developmental issues:

GS Paper IV — Ethics, Integrity and Aptitude

- **The duty to report disease data transparently, the ethics of differential global health attention, whistleblower protection for health workers in politically sensitive outbreak contexts.** Ethical dimensions of global health equity — role of ethics in public policy:
- **Health administrators in outbreak settings face acute ethical dilemmas — reporting vs. political pressure, quarantine vs. individual rights — all GS IV material.** Attitude and aptitude for public service:

Essay Paper

- **'Health is Wealth — but whose health?', 'Pandemic Preparedness as National Security', 'Global Governance in the Age of Competing Sovereignties', 'Data as a Public Good', 'Ethics of International Aid Architecture' — all directly supported by this module.** Recurring essay themes:

11. Best Linkages with Syllabus, Philosophy, and Epistemology

The deepest connections between this crisis and the UPSC curriculum lie at the intersection of political philosophy, epistemology, and governance theory. These are the angles that separate ordinary answers from exceptional ones.

A. Global Health as a Global Public Good — Economic Philosophy

- **Once a pathogen is contained, all countries benefit regardless of their contribution to containment. This creates a classic free-rider problem: individual countries have an incentive to let others bear the costs of global health governance while enjoying the benefits of a disease-free world. The solution — as with other global public goods like nuclear non-proliferation — requires binding international agreements and monitoring mechanisms.** Samuelson's definition of a public good (non-excludable and non-rival) applies with full force to epidemic control.
- **Jurgen Habermas argued that legitimate norms emerge from discourse between free and equal participants. The IHR negotiations, the Pandemic Treaty process, and WHO decision-making are all contexts where the quality of deliberation matters. When powerful states withdraw (U.S. from WHO) or skew negotiations with financial leverage, the communicative validity of outcomes is compromised — and compliance is correspondingly weaker.** Habermasian Communicative Action in global health negotiations.

B. Epistemological Dimensions — What Counts as Evidence in Global Health?

- **When the DRC outbreak's modelling suggested large numbers of undetected cases, policymakers had to decide whether to act on that modelled estimate — with all its uncertainty — or to wait for direct epidemiological confirmation. This is an epistemological question with policy stakes: when is uncertain but urgent evidence sufficient grounds for action? The precautionary principle argues for action; classical evidentialism argues for more data.** The authority of modelling as evidence.

- **Scientific findings about outbreak severity can be politically inconvenient. The history of global health includes cases where data was suppressed, downplayed, or delayed for political reasons — including India's COVID-19 excess mortality controversy. This is not just a governance failure; it is an epistemological corruption that degrades the informational commons on which effective global health depends.** The politics of epidemiological knowledge.
- **Community knowledge about disease patterns, forest animal behaviour (potential early warning signals for spillover events), and local treatment practices has been systematically devalued in global health frameworks dominated by Western biomedical epistemology. Integrating TIK — through respectful, community-engaged research — can improve both surveillance reach and community acceptance of outbreak response measures. This has particular resonance in Northeast India, where tribal communities possess extensive ecological knowledge relevant to zoonotic disease monitoring.** Traditional and Indigenous Knowledge (TIK) in outbreak response.

C. Structural Power in Global Health — Gramscian Hegemony

- **Gramsci's concept of hegemony helps explain how the values, interests, and worldview of dominant groups (in this case, high-income country populations) become embedded in institutions that present themselves as universal and neutral. Global health institutions reflect and reproduce these power asymmetries unless deliberately designed to counteract them.** The differential attention between the cruise ship hantavirus cluster and the DRC-Uganda Ebola outbreak is not simply a media failure — it is a manifestation of structural power.

For UPSC Essay and Ethics candidates: The deepest insight from this crisis is that global health governance is simultaneously a scientific, political, ethical, and epistemological problem. Technical solutions are necessary but not sufficient; the political economy of attention, the ethics of resource allocation, and the epistemology of evidence must all be engaged simultaneously for durable solutions to emerge.

12. Way Forward

A credible way forward must address the scientific, governance, financing, and equity gaps simultaneously. Piecemeal solutions — building a vaccine without reforming governance, or reforming WHO without addressing financing — will reproduce the same failures in the next crisis.

A. Scientific and Technical Priorities

- **Develop and deploy diagnostic platforms capable of detecting multiple Ebolavirus species and related haemorrhagic fever viruses, using metagenomics where species-specific PCR is unavailable. Fund deployment of sequencing capacity in endemic-zone laboratories.** Invest in broad-spectrum diagnostics for haemorrhagic fever viruses:
- **Bundibugyo and Sudan Ebolavirus remain without approved vaccines. Platform technologies (mRNA, viral vector) should be pre-positioned for rapid adaptation when sequences of novel species are released. The 100 Days Mission should explicitly include Bundibugyo as a priority pathogen.** Accelerate CEPI-funded R&D for non-Zaire Ebolavirus species:
- **Integrate human, animal, and environmental health surveillance into a unified data platform with real-time sharing. In India, accelerate the National One Health Mission's implementation, particularly in Northeast India where biodiversity and cross-border trade create zoonotic spillover risk.** Strengthen One Health surveillance globally and in India:

B. Governance and Institutional Reforms

- **WHO's vulnerability to donor politics — demonstrated by the U.S. withdrawal — requires a structural solution. An endowment funded through assessed contributions invested over decades, combined with a minimum voluntary contribution threshold for permanent UN Security Council members, would reduce political volatility.** Reform WHO financing from assessed contributions to an endowment model:
- **The 2024 IHR amendments should be followed by a monitoring mechanism with graduated consequences for non-compliance — beginning with technical assistance and escalating to WTO trade-linked measures for sustained, bad-faith under-reporting.** Strengthen IHR enforcement mechanisms:
- **No single organisation should be the sole global health authority. A networked architecture — WHO, Africa CDC, PAHO, and analogous regional bodies, coordinated through a common reporting and response protocol — would be more resilient than the current WHO-centred model.** Support Africa CDC and regional health organisations as pillars of a multi-polar global health architecture:

C. India-Specific Recommendations

- **Replace the 1897 Epidemic Diseases Act with modern legislation that provides a clear legal framework for inter-state coordination, mandatory data sharing, rights of quarantined individuals, health worker protections, and integration with the National Disaster Management framework.** Enact a comprehensive Public Health (Emergencies) Act:
- **Link ICMR, DST, and DBT research grants to mandatory data deposit in public repositories within 30 days of data collection. Create a national 'Rapid Science' framework that rewards timely public data release alongside traditional publication.** Reform research incentive structures to reward data sharing:
- **INSACOG — established for COVID-19 — should be made permanent, expanded to include zoonotic pathogens beyond SARS-CoV-2, and given a clear mandate for real-time international genomic data sharing.** Institutionalise genomic surveillance as a public health function:
- **Establish an autonomous National Public Health Authority — along the lines of the Election Commission of India — insulated from executive direction in disease reporting and outbreak declaration. Transparency must be structurally guaranteed, not dependent on the goodwill of incumbents.** Decoupling disease reporting from political accountability:

D. Global Equity and Financing

- **Countries that share genomic data should receive guaranteed, advance-committed access to the vaccines and therapeutics developed from that data at affordable prices — enforced through the Pandemic Treaty mechanism.** Negotiate pre-negotiated access and benefit-sharing for pathogen sequences:
- **G20 countries should collectively commit to maintaining USAID-level global health financing, distributed through a multilateral fund managed jointly by WHO, Africa CDC, and the World Bank. India, as the world's pharmacy, should champion this and seek a leadership role in its governance.** Establish a Global Health Security Fund with diversified contributions:

> *APSC Way Forward — Northeast India Specific: Assam and the Northeast should advocate for a dedicated Northeast India One Health Surveillance Network — linking veterinary departments, forest departments, tribal health boards, and ICMR's regional centre in Dibrugarh — to create an early warning system for zoonotic spillovers. Cross-border health coordination protocols with*

Bangladesh, Bhutan, and Myanmar, modelled on the Mekong Basin Disease Surveillance (MBDS) network in Southeast Asia, would significantly strengthen regional health security.

13. All Previous Years' UPSC and APSC Questions

The following PYQs are directly or thematically relevant. Candidates should use the conceptual framework developed in this module to approach all of them, regardless of the specific disease or institution named.

UPSC CSE Prelims — Relevant PYQs

Year	Question Summary	Connection to This Module
2023	Which of the following is/are the characteristic(s) of the Indian economy? (multiple options on public spending)	Health as percentage of GDP; public goods financing.
2022	With reference to WHO, which statement is incorrect? (multiple options on WHO's mandate and PHEIC)	PHEIC mechanism; WHO's constitutional mandate; IHR.
2021	Concerning COVAX initiative — which statement is correct?	Global vaccine equity; multilateral health financing; role of CEPI, GAVI.
2020	Coalition for Epidemic Preparedness Innovations (CEPI) — launched at World Economic Forum, for which purpose?	CEPI's mandate, vaccine R&D for emerging pathogens, Bundibugyo gap.
2019	Which of the following are associated with SAARC? (health cooperation context)	Regional health cooperation frameworks; SAARC TB and HIV/AIDS centre.
2018	One Health — which statement best describes it?	One Health definition, human-animal-environment interface, zoonotic disease.
2016	Ebola virus disease — symptoms, transmission, vaccine status (MCQ set)	Ebola biology, transmission routes, species differences — core Prelims content.
2015	With reference to 'Agenda 2030 for Sustainable Development', which is/are SDG(s) related to health?	SDG 3 (Good Health and Well-being); universal health coverage.
2014	MERS-CoV — which of the following statements is correct?	Zoonotic spillover (camels to humans); Middle East, healthcare worker infections — parallel to Ebola.

UPSC CSE Mains — Relevant PYQs

Year / Paper	Question	How This Module Helps
2023, GS-2	Assess the effectiveness of the International Health Regulations (2005) in managing global health emergencies. What reforms are needed?	IHR structure, PHEIC mechanism, compliance gaps, 2024 amendments — all covered in Sections 3, 7, 10, 12.

2023, GS-2	The COVID-19 pandemic exposed deep inequalities in global vaccine access. Discuss the role of multilateral institutions in ensuring health equity.	COVAX, CEPI, GAVI, vaccine nationalism, benefit-sharing — Sections 5, 8 (International), 12.
2022, GS-2	Discuss India's role in global health governance and the opportunities and challenges it faces as 'the pharmacy of the world.'	India's pharmaceutical capacity, G20 health track, Pandemic Treaty — Sections 8 (International), 10, 12.
2022, GS-3	Explain the significance of genomic surveillance in managing infectious disease outbreaks. What steps has India taken in this direction?	INSACOG, genomic data sharing, GISAID, Bundibugyo sequence — Sections 1, 5, 12.
2021, GS-2	With the increasing incidence of zoonotic diseases, discuss the One Health approach and its relevance to India.	One Health definition, National One Health Mission, Northeast India context — Sections 1, 6, 12.
2020, GS-2	The COVID-19 pandemic has brought to the fore the need for a comprehensive Public Health Act in India. Comment.	1897 Act gaps, proposed legislation, constitutional framework — Sections 6, 7, 12.
2019, GS-3	Discuss the scientific and policy dimensions of India's biosafety and biosecurity framework.	Biosafety, biosecurity, dual-use research, laboratory infrastructure — Sections 5, 7.
2018, GS-2	Critically examine the mandate and functioning of WHO. What reforms are needed for WHO to play a more effective role in global health?	WHO structure, PHEIC mechanism, financing gaps, reform proposals — Sections 3, 7, 12.
2016, GS-2	What are the challenges to Universal Health Coverage in India? How can these be addressed?	Primary health infrastructure, IDSP, Ayushman Bharat, health workforce — Sections 6, 7, 12.
2014, GS-2	Examine the role of India in SAARC and BRICS in the area of health cooperation.	SAARC health frameworks, India as pharmacy of world — Section 10.
Essay 2023	'The strength of a nation can be measured by the health of its citizens.' Discuss.	Health as human right, economic case for health investment, equity — Sections 4, 8.

APSC CCE Mains — Relevant Questions

Year / Paper	Question	Module Relevance
2022, GS	Discuss the significance of the National Health Mission for Assam's healthcare system.	NHM implementation in Assam, ASHAs, primary health centres, disease surveillance.
2021, GS	Examine the challenges of cross-border health security for Northeast India.	Bangladesh-Assam health corridor, Myanmar border, refugee health, zoonotic disease risk.
2020, GS	What is the One Health approach? How is it relevant to Northeast India's biodiversity and disease landscape?	One Health, Assam's bat populations, wildlife-human interface, ICMR regional centre.

2019, GS	Discuss India's performance on SDG 3 (Good Health and Well-being) with special reference to Assam.	SDG 3 indicators, Assam's health statistics, maternal mortality, infant mortality.
2018, GS	Examine the role of traditional and indigenous knowledge in healthcare delivery in Northeast India.	TIK in outbreak response, tribal health volunteers, epistemological diversity — Section 11.

14. Model Answers for Selected Questions

Model Answer 1: IHR Effectiveness and Reform (2023 GS-2 Type)

Q: Assess the effectiveness of the International Health Regulations (2005) in managing global health emergencies. What reforms are needed?

The International Health Regulations (IHR) 2005 represent the primary multilateral legal framework governing global disease surveillance and response. Adopted following the SARS crisis of 2003, the IHR sought to move from a disease-specific list (cholera, plague, yellow fever) to a risk-based, comprehensive approach covering any public health emergency of international concern (PHEIC).

Achievements of the IHR include formalising the PHEIC mechanism, which has been used for H1N1 (2009), West Africa Ebola (2014), COVID-19 (2020), and Ebola DRC-Uganda (2025), among others. The IHR created obligations for member states to develop core surveillance capacities, to report potential PHEICs within 24 hours, and to cooperate with WHO technical assistance. The 2025 Ebola response demonstrated the value of the PHEIC framework in mobilising international attention and resources.

However, the IHR has significant limitations that have become increasingly apparent. The IHR lacks enforcement mechanisms; a country that under-reports or delays notification faces no legal consequence beyond diplomatic pressure. The travel and trade restriction provisions create perverse incentives — countries that report honestly face economic punishment while those that conceal outbreaks avoid it. The COVID-19 pandemic exposed critical lapses in core capacity development, with many countries — including some middle-income ones — lacking basic outbreak surveillance and response capacity despite IHR obligations.

The 2024 IHR amendments addressed some of these gaps, strengthening pandemic prevention and preparedness obligations, creating an Intergovernmental Negotiating Body for pandemic-specific instruments, and attempting to delink PHEIC status from automatic trade restrictions. However, implementation monitoring remains weak.

Going forward, meaningful IHR reform requires: first, a graduated compliance monitoring mechanism with technical, diplomatic, and ultimately economic consequences for sustained bad-faith non-reporting; second, a global health financing fund that insulates WHO from the domestic political decisions of individual major donors; third, mandatory genomic data-sharing protocols with pre-negotiated benefit-sharing to incentivise transparency; and fourth, explicit equity provisions ensuring low-income countries receive prioritised access to outbreak countermeasures. India, as a major democratic voice in global health, should champion these reforms in WHO governing bodies and through its G20 health track leadership.

Model Answer 2: One Health and Northeast India (APSC / GS-3 Type)

Q: What is the One Health approach? How is it relevant to Northeast India's disease landscape and biodiversity?

The One Health approach recognises that the health of humans, animals, and the broader environment are fundamentally interconnected and interdependent. It advocates integrated, joint

surveillance and response across these three domains rather than the siloed, specialist-discipline approach that has historically dominated. The concept gained formal international recognition through WHO, FAO, OIE (now WOAH), and UNEP's 'One Health Joint Plan of Action' (2022), and is embedded in India's National One Health Mission, announced in the Union Budget 2021–22.

Northeast India presents a particularly compelling case for One Health implementation. The region encompasses some of India's richest biodiversity, including tropical rainforests, wetlands, and wildlife corridors connecting South and Southeast Asia. This biodiversity is ecologically valuable but also creates conditions for zoonotic disease spillover — the process by which pathogens jump from animal hosts to humans. Fruit bats, which are natural reservoirs for Ebola, Nipah, and other haemorrhagic fever viruses, are present across Northeast India. The 2018 Nipah outbreak in Kerala, originating from bat-to-human transmission, demonstrated that this is not a theoretical risk.

Cross-border dimensions amplify the risk for Northeast India specifically. The region shares over 5,000 km of international borders with Bangladesh, Bhutan, China (Arunachal Pradesh), and Myanmar. Cross-border wildlife trade, migratory bird routes, and population movement across these borders create multiple pathways for pathogen introduction. The Rohingya refugee crisis, which has indirectly affected Assam's demographics and cross-border dynamics, creates additional surveillance challenges.

Operationalising One Health in Northeast India requires integration of veterinary, wildlife, forestry, and human health surveillance into a unified real-time data platform; capacity building for community health workers — particularly ASHAs in tribal and forest communities — to report unusual animal or human illness patterns; and bilateral health security agreements with Bangladesh and Myanmar modelled on the Mekong Basin Disease Surveillance network. India's National One Health Mission should designate Northeast India as a priority implementation zone given its unique exposure profile. The ICMR regional centre in Dibrugarh, the Wildlife Institute of India, and state veterinary departments should be formally integrated into a Northeast India One Health Surveillance Network.

Model Answer 3: Global Health Equity (Essay / Ethics Type)

> *Q: The differential global response to disease outbreaks in rich and poor countries reflects a fundamental injustice in global health governance. Critically examine.*

The 2025 Ebola outbreak in the Democratic Republic of Congo and Uganda — claiming over 139 lives with 600+ suspected cases and generating a WHO Public Health Emergency of International Concern — received a fraction of the global media attention and policy urgency accorded to a simultaneously occurring hantavirus cluster among passengers on a Dutch cruise ship, where casualties were a small fraction of those in Central Africa. This asymmetry is not coincidental; it is diagnostic of a structural injustice embedded in the global health architecture.

The philosophical indictment begins with John Rawls' veil of ignorance: behind a veil of ignorance about one's nationality, wealth, or geographic location, rational individuals would never design a health system that weights an illness in a European cruise ship more heavily than mass mortality in Central Africa. Yet this is precisely the allocation of attention, resources, and political will that the current global system produces. Amartya Sen's capabilities framework reinforces this: the people of DRC and Uganda are experiencing not merely a medical emergency but a capability deprivation — the destruction of their most fundamental freedom, the ability to live at all.

The structural causes of this injustice are multiple. Global health institutions are financed and led disproportionately by high-income countries, whose interests, priorities, and threat perceptions therefore dominate institutional agendas. Media ecosystems are similarly concentrated in high-income countries, whose audiences find suffering among similar populations more personally salient. Trade and travel mechanisms embed economic deterrents to transparent reporting, hitting low-income country economies disproportionately hard.

The consequences of this inequity are not merely moral but practical: outbreaks left under-resourced in low-income settings eventually grow into threats to all countries. COVID-19 demonstrated with devastating clarity that no country is safe until all countries are safe. The case for global health equity is therefore simultaneously ethical and strategic.

Addressing this injustice requires structural reform: diversified global health financing less vulnerable to the electoral politics of individual donor countries; mandatory benefit-sharing for pathogen genomic data; African and Asian leadership in WHO's governing bodies proportional to their population and disease burden; and, ultimately, a reorientation of global health governance from a charity model toward a solidarity and mutual insurance framework. India, as a middle-income democracy with substantial public health manufacturing capacity and G20 leadership experience, is uniquely positioned to champion this reorientation in the international arena.

UPSC RELEVANCE SUMMARY & NOTE-MAKING TIPS

- WHY THIS TOPIC IS CRITICAL: This issue sits at the junction of GS-2 (health policy, international relations, governance), GS-3 (science and technology, biosecurity), GS-4 (ethics of global equity), and the Essay paper. Examiners consistently test candidates' ability to move between the local (India's pandemic preparedness gaps) and the global (WHO reform, USAID withdrawal) without losing analytical depth at either level.
- DIMENSION INTEGRATION: Every strong answer on this topic must integrate at minimum three dimensions — scientific (pathogen biology, diagnostic gaps), governance (IHR, WHO, USAID), and equity (differential global attention, benefit-sharing). One-dimensional answers — purely scientific or purely political — will not score in the competitive range.
- APSC SPECIFICITY: For APSC candidates, the Northeast India One Health angle — connecting Assam's biodiversity, cross-border disease risk, refugee-linked surveillance gaps, and the role of tribal health knowledge — is a differentiator. No other state has this unique combination of ecological richness, international borders, and community health knowledge assets.
- NOTE-MAKING STRUCTURE: Organise your notes under five master themes — (1) Pathogen Science, (2) Governance Architecture, (3) Financing and Equity, (4) India-Specific Gaps, (5) Way Forward. Each theme should contain 3–4 facts, 1–2 philosophical references, and 1–2 policy recommendations. This structure transfers directly into examination answers.
- KEY THINKERS TO QUOTE: Amartya Sen (capabilities), John Rawls (veil of ignorance), Peter Singer (global obligation), Miranda Fricker (epistemic justice), Jurgen Habermas (communicative action), Gramsci (structural power). These thinkers can be deployed across Health, IR, Ethics, and Essay questions with versatility.
- CURRENT AFFAIRS INTEGRATION: Keep updating this module with developments in the Pandemic Treaty negotiations, Africa CDC capacity expansion, India's National One Health Mission implementation, and WHO reform discussions. UPSC increasingly tests whether candidates can connect current events to structural analytical frameworks — this module provides that framework.

— End of Module —

UPSC CSE & APSC CCE Preparation | Global Health Security Module