



## Perspective

## Policy

### International Conventions & One Health

The effect of environmental changes and erosion of the biosphere by unchecked human habitat expansion poses a collective risk to both human and animal health. Introduction of new infections from hitherto unknown animal reservoirs to humans followed by devastating outbreaks and pandemics have altered the course of human history and footprints of civilization<sup>1</sup>. Human health is universally connected to animal health and *vice-versa*. The activity of the Ebola virus in Africa, avian influenza in different parts of the world, Nipah virus in South Asia, and the ongoing COVID-19 pandemic caused by a novel coronavirus SARS-CoV-2 have been a wake-up call for the Governments of various countries and International agencies responsible for combating infectious diseases<sup>2</sup>. Thus, a collective, well-coordinated, interdisciplinary approach pooling diverse resources and multiple stakeholders is a need of the hour requirement to prevent, respond and contain these emerging zoonotic pathogens<sup>3</sup>.

The One Health concept is thus the most fundamental approach for combating emerging zoonotic disease threats, develop relevant policies, create new legislation/national programmes and also coordinate multi-stakeholder investments to redefine the future horizon for better public health outcomes during an unprecedented public health crisis<sup>4</sup>. The extent of the problem is however, multi-faceted. A large fraction of recent novel human infections are of zoonotic origin<sup>5-7</sup>. On a month-wise timescale the World Health Organization (WHO) receives about 7,000 new signals of potential outbreaks that need investigation (<https://open.who.int/2016-17/our-work/category/12/programme/12.003/eba>). Between 1980 and 2013, approximately 44 million cases were investigated globally. It has been estimated that for an outbreak to travel from a remote village to any major city in the world, a timeline of 36 hours is sufficient<sup>8</sup>. Any outbreak, anywhere in the world ultimately translates to massive economic losses that have a

ripple effect on global GDP (gross domestic product) highlighting the urgent need to integrate cross-sectorial studies on disease economics of current and emerging zoonosis<sup>9-11</sup>. The ongoing COVID-19 pandemic is a classic example.

The concept of human, animal and environmental interaction and disease origin has been reflected in the annals of medical history<sup>12-14</sup>. The need to develop interactive platforms and action agendas has also found early intellectual pursuits<sup>15</sup>. In 1964, Professor C.W. Schwabe developed on this fundamental integration approach of human and veterinary health that was later recognized by the Centers for Disease Control and Prevention, USA, and an integrated programme on human and animal health interface studies formed at the University of California<sup>1,15,16</sup>.

The United Nations took cognizance of this emerging threat and formed the UN Convention of Biodiversity. This Convention took shape as an international treaty, formally signed by State parties in 1992 and 1993<sup>17</sup> and aggressively evolved more formal components of a multilateral dialogue with national implementation nodes and urged Member States for continuous need-based evolution and implementation of consensus action points. Further value-addition to this Convention took place through the Cartagena protocol on biosafety (2000, <https://bch.cbd.int/protocol/>) and Nagoya Protocol (2014)<sup>18</sup> ratifications. All these collective initiatives supplement the One Health effort at regional, national and international levels.

The International Health Regulation (IHR) formed in 1969 makes it mandatory for signatory nations to report all notified public health incidences through national implementation nodes. This agreement further expanded its scope to include existing, novel, re-emerging diseases and other public health emergencies<sup>19</sup>. Through a new legal framework binding to 196 signatory countries, the IHR ensured

fast collection of real-time disease information and provided conceptual clarity on what may constitute a public health emergency threat/event of international concern and mobilized international reporting and assistance<sup>19</sup>. Multiple agencies of the United Nations (UN) like the WHO, in partnership with the Food and Agriculture Organization (FAO), World Organization for Animal Health (OIE) and other international and national partners included the relevant animal health component within the framework of the IHR which is core to the fundamental of One Health approach. The WHO has declared five global health emergencies since the 2009 pandemic of novel human influenza virus H1N1 of swine origin<sup>20</sup>. The IHR monitoring framework builds upon strengthening the One Health component further<sup>21</sup>. This instrument further supplements other platforms of international health emergency responses like the WHO GOARN (Global Outbreak Alert and Response Network) (<https://extranet.who.int/goarn/>) and also has overlaps with the Biological Weapons Convention (<https://libraryresources.unog.ch/bioweapons>).

One Health is also an integral part of the sustainable developmental goals (SDGs) of the UN and covered under the mandates 3 and 15 ([https://www.who.int/health-topics/sustainable-development-goals#tab=tab\\_3](https://www.who.int/health-topics/sustainable-development-goals#tab=tab_3)). This is highly relevant as UN SDG forms the core guiding principle of developmental programmes of many nations, specially developing countries where the threats from emerging zoonosis are high.

The aforementioned issues highlight the crucial interface of One Health with another very important international platform, the Global Health Security Agenda (GHSA) that is a convergence of multiple international conventions like WHO, IHR, OIE, United Nations Security Council (UNSC) 1540, Biological Weapons Convention and other relevant conventions addressing issues of health security<sup>22</sup>. The GHSA has now been further strengthened through the 2017 “Kampala Declaration” (<https://ghsagenda.org/2017/11/09/kampala-declaration-2017/>) that emphasizes a more streamlined framework: GHSA 2024- addressing the post-COVID-19 lacunae. Many countries have adapted from GHSA resources material for developing their own national guidelines of biosafety and biosecurity. The current COVID-19 pandemic further emphasizes the need for expansion of the scope of such international agreements interfacing with One Health policies at the national level.

The United Nations Environment Protection Programme (UNEPP) created in 2016 (<https://sustainabledevelopment.un.org/index.php?page=view&type=30022&nr=243&menu=3170>), addresses the challenges of the One Health Approach as its core concept. Emergence of COVID-19 pandemic stresses the need for further strengthening this programme, widening its objectives and interlinking a cross platform dialogue with other climate change and biodiversity conventions to create a new comprehensive and strategic global framework called the 2021-2030 Decade on Ecosystem Restoration Programme (DERP)<sup>23</sup>.

As the world grapples to equilibrate and recover from the multiple collateral damages from the COVID-19 pandemic, these emerging UN conventions and frameworks including the Convention on Biodiversity (CBD)<sup>24</sup> attempt to glue in a practical, fast onset, sustainable international effort towards restoring the environment and mitigating future risks from emerging zoonosis. The One Health concept is fundamental and core to this effort.

The importance of One Health fundamentals has been further highlighted by the ongoing COVID-19 pandemic. It has indicated the lacunae in the existing structure and highlighted weaknesses in synchronized response-mitigation deployment tools for fighting public health emergencies<sup>25</sup>. It is high time to comprehend, expand the scope of animal-human-environment interaction on health, One Health, deploy appropriate actions, introduce new legislations, frame international laws, adapt and renovate relevant existing conventions, enhance agreements, and deploy at all levels (local, national and global) to combat the threat of emerging future pandemics.

**Financial support & sponsorship:** None

**Conflicts of Interest:** None

**Atanu Basu<sup>1,\*</sup> & Harpreet Sandhu<sup>2</sup>**

<sup>1</sup>Electron Microscopy & Histopathology Group, ICMR-National Institute of Virology, Pune 411 001, Maharashtra & <sup>2</sup>International Health Division, Indian Council of Medical Research, New Delhi 110 029, India

\*For correspondence:  
basu.atanu@gov.in

Received: March 3, 2021.

## References

1. Evans BR, Leighton FA. A history of One Health. *Rev Sci Tech Off Int Epiz* 2014; 33 : 413-20.
2. Moradian N, Ochs HD, Sedikies C, Hamblin MR, Camargo Jt CA, Martinez JA, *et al.* The urgent need for integrated science to fight COVID-19 pandemic and beyond. *J Transl Med* 2020; 18 : 205.
3. Kelly TR, Machalaba C, Karesh WB, Crook PZ, Gilardi K, Nziza J, *et al.* Implementing One Health approaches to confront emerging and re-emerging zoonotic disease threats: lessons from PREDICT. *One Health Outlook* 2020; 2 : 1.
4. World Health Organization. *One Health*. Available from: <https://www.who.int/news-room/q-a-detail/one-health>, accessed on March 4, 2021.
5. World Health Organization. *Combating Emerging Infectious Diseases in the South East Asia Region*, 2005. Available from: <https://apps.who.int/iris/handle/10665/204878>, accessed on March 4, 2021.
6. Graham JP, Leibler JH, Price LB, Otte MJ, Pfeiffer DU, Tiensen T, *et al.* The animal-human interface and infectious disease in industrial food animal production: rethinking biosecurity and biocontainment. *Public Health Rep* 2008; 123 : 282-99.
7. World Health Organization. *Neglected zoonotic Diseases*. Available from: [https://www.who.int/neglected\\_diseases/diseases/zoonoses/en/#:~:text=At%20least%2061%25%20of%20all,pathogens%20during%20the%20past%20decade](https://www.who.int/neglected_diseases/diseases/zoonoses/en/#:~:text=At%20least%2061%25%20of%20all,pathogens%20during%20the%20past%20decade), accessed on March 10, 2021.
8. Overton CE, Stage HB, Ahmad S, Curran-Sebastian J, Dark P, Das P, *et al.* Using statistics and mathematical modelling to understand infectious disease outbreaks: COVID-19 as an example. *Int Dis Modelling* 2020; 5 : 409-41
9. World Economic Forum. *Insights on handling coronavirus from an earlier report on business and outbreaks*. Available from: <https://www.weforum.org/reports/outbreak-readiness-and-business-impact>, accessed on March 4, 2021.
10. Brookings. *Globalization and disease: the case of SARS*. Available from: <https://www.brookings.edu/research/globalization-and-disease-the-case-of-sars-2/>, accessed on March 4, 2021.
11. World Bank Group. *People, Pathogens, and Our Planet: The Economics of One Health*. Available from: <https://openknowledge.worldbank.org/handle/10986/11892>; accessed on March 4, 2021.
12. Schneider D, Lilienfeld DE, editors. *Public health: the development of a discipline*. USA: Rutgers University Press; 2008.
13. Wear A. Place, health, and disease: the airs, waters, places tradition in early modern England and North America. *J Mediev Early Mod Stud* 2008; 38 : 443-65.
14. Ackerknecht EH. *Rudolf Virchow: Doctor, statesman, anthropologist*, Madison (WI):University of Wisconsin: 1953.
15. Gyles C. One Medicine, One Health One World. *Can Vet J* 2016; 57 : 345-6.
16. Schwabe C. *Veterinary medicine and human health*. 2<sup>nd</sup> ed. Baltimore: Williams & Wilkins; 1969.
17. United Nations. International Day for Biological Diversity. 22 May 2020. Available from <https://sdg.iisd.org/events/international-day-for-biological-diversity-2020/>, accessed on March 4, 2021.
18. Knauf S, Abel L, Hallmaier-Wacker LK. The Nagoya protocol and research on emerging infectious diseases. *Bull World Health Org* 2019; 97 : 379.
19. World Health Organization. *Frequently asked questions about the International Health Regulations (2005)*. Available from: <https://www.who.int/ihr/about/FAQ2009.pdf>, accessed on March 4, 2021.
20. Mullen L, Potter C, Gostin LO, Cicero A, Nuzzo JB. An analysis of international health regulations emergency committees and public health emergency of international concern designations. *BMJ Glob Health* 2020; 5 : e002502.
21. De La Rocque S, Caya F, El Idrissi AH, Mumford L, Belot G, Carron M, *et al.* One Health operations: a critical component in the International Health Regulations Monitoring and Evaluation Framework. *Rev Sci Tech* 2019; 38 : 303-14.
22. Global Health Security Agenda. *Global Health Security Agenda (GHS) 2024 framework*. Available from: <https://ghsagenda.org/wp-content/uploads/2020/06/ghsa2024-framework.pdf>, accessed on March 4, 2021.
23. United Nations's Decade on restoration, UNEP, FAO. *UN decade to officially launch with World Environment Day 2021 (5 June)*. Available from: <https://www.decadeonrestoration.org/>, accessed on March 4, 2021.
24. World Health Organization. *Biodiversity and Health: the WHO-CBD joint work programme*. Available from: <https://www.who.int/news/item/01-01-2020-biodiversity-and-health-the-who-cbd-joint-work-programme>, accessed on March 4, 2021.
25. Ruckert A, Zinszer K, Zarowsky C, Labonté R, Carabin H. What role for One Health in the COVID-19 pandemic? *Can J Public Health* 2020; 111 : 641-4.