



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



Letter to the Editor

The outstanding relevance of the One Health approach



The resurgence of infectious diseases of zoonotic origin observed in recent years, including Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS), has caused severe increase in morbidity and mortality for humans globally.¹ Zoonotic diseases account for approximately 60% of all emerging infectious diseases,² and play a profound economic impact, which has been estimated to exceed 120 billion dollars during the period between 1995 and 2008.³ The SARS-CoV-2, which has resulted in remarkable health, social, economic and political impacts, is very likely to be another disease in the list of those that crossed the animal–human barrier.

Although zoonosis remains a major global concern, low- and middle-income countries (LMICs) remain at higher risk of zoonotic diseases, given the nature of contact between animals and humans, limited surveillance capacities and the limited availability of resources. This is particularly true in several countries of the Middle East; aspects like limited access to safe and clean water, presence of domestic animal that act as the reservoir for the sandflies and lack of effective vector control programs in recent years have resulted in up to 60% of the worldwide burden of cutaneous leishmaniasis in the Eastern Mediterranean Region (EMR) of the World Health Organization.⁴ However, the proliferation of water storage tanks as an adaptation strategy during drought conditions in the same region created a potential for transmission of diseases like chikungunya and Rift Valley fever.⁴ Emerging infectious and parasitic diseases are responsible for around 15% of the EMR morbidities and mortalities.⁵ Also, continuous conflicts and humanitarian emergencies led to extreme population movements (internal displacement and migration) in the last decades, which contribute to the spread of infections and re-emergence of infectious diseases in countries hosting refugees. However, mass gathering events like during Islamic pilgrimage (Hajj) further contribute to increasing the risk of zoonotic disease transmission at regional and global levels because of the massive slaughter of millions of livestock within a short period.⁶

Current and past zoonotic outbreaks, such as the SARS and MERS outbreaks in 2002 and 2012,⁷ represent another urgent call on the need of public health preparedness, readiness and response through the human–animal–environment interface using the One Health (OH) approach. The OH approach refers to the human–animal–environmental interdependence through a multisectoral, collaborative, and transdisciplinary approach working at the local, national, regional, and global levels.⁸ Such an approach would be

able to ensure timely and effective zoonotic diseases' prevention and control, also covering broader socio-economic and ecological determinants of health.⁹

Across the continents, several LMICs have embarked on activities to prioritize zoonotic diseases: the Democratic Republic of Congo, Thailand, Ethiopia, Azerbaijan, Uganda, Kenya, Tanzania, Cameroon and South Africa prioritized diseases on a national level with a goal to strengthen multisectoral collaboration and focus laboratory, surveillance, and prevention efforts.¹⁰ The multisector strategy would guarantee a successful joint response, especially in detecting the emergence of a Public Health Emergency of International Concern through real-time surveillance, which could effectively mitigate outbreak risks. The strategy would additionally reduce the demand for scarce financial and personnel resources.

Operationalization of the OH approach should be a priority agenda item globally and at national level, particularly low resourced settings that are currently ravaged by the COVID-19 pandemic and where efficient all-of-society and all-of-sector mitigation measures could play in mitigating the impact of future epidemics.

References

1. Ryu WS. New emerging viruses. *Mol Virol Human Pathogen Virus* 2017; 289–302.
2. Cascio A, Bosilkovski M, Rodriguez-Morales AJ, Pappas G. The socio-ecology of zoonotic infections. *Clin Microbiol Infect* 2011 Mar;17(3):336–42. <https://doi.org/10.1111/j.1469-0691.2010.03451.x>. PMID: 21175957.
3. Hampson K, Coudeville L, Lembo T, Sambo M, Kieffer A, Attlan M, et al. Global alliance for rabies control partners for rabies prevention. Estimating the global burden of endemic canine rabies. *PLoS Neglected Trop Dis* 2015 Apr 16;9(4): e0003709. <https://doi.org/10.1371/journal.pntd.0003709>. Erratum in: *PLoS Negl Trop Dis*. 2015 May;9(5):e0003786. PMID: 25881058; PMCID: PMC4400070.
4. Bellizzi S, Lane C, Elhakim M, Nabeth P. Health consequences of drought in the WHO Eastern Mediterranean Region: hotspot areas and needed actions. *Environ Health* 2020 Nov 12;19(1):114. <https://doi.org/10.1186/s12940-020-00665-z>. PMID: 33183302; PMCID: PMC7659048.
5. Abubakar A, Malik M, Pebody RG, Elkholy AA, Khan W, Bellos A, et al. Burden of acute respiratory disease of epidemic and pandemic potential in the WHO Eastern Mediterranean Region: a literature review. *East Mediterr Health J* 2016 Oct 2;22(7):513–26. PMID: 27714746.
6. Almasri M, Ahmed QA, Turkestani A, Memish ZA. Hajj abattoirs in Makkah: risk of zoonotic infections among occupational workers. *Vet Med Sci* 2019 Aug;5(3): 428–34. <https://doi.org/10.1002/vms3.169>. Epub 2019 Apr 23. PMID: 31016884; PMCID: PMC6682789.
7. Peeri NC, Shrestha N, Rahman MS, Zaki R, Tan Z, Bibi S, et al. The SARS, MERS and novel coronavirus (COVID-19) epidemics, the newest and biggest global health threats: what lessons have we learned? *Int J Epidemiol* 2020 Jun 1;49(3):717–26. <https://doi.org/10.1093/ije/dyaa033>. PMID: 32086938; PMCID: PMC7197734.

8. Zinsstag J, Schelling E, Wyss K, Mahamat MB. Potential of cooperation between human and animal health to strengthen health systems. *Lancet* 2005 Dec 17;**366**(9503):2142–5. [https://doi.org/10.1016/S0140-6736\(05\)67731-8](https://doi.org/10.1016/S0140-6736(05)67731-8). PMID: 16360795.
9. Schmiede D, Perez Arredondo AM, Ntjal J, Minetto Gellert Paris J, Savi MK, Patel K, et al. One Health in the context of coronavirus outbreaks: a systematic literature review. *One Health* 2020 Dec;**10**:100170. <https://doi.org/10.1016/j.onehlt.2020.100170>. Epub 2020 Sep 26. PMID: 33015306; PMCID: PMC7518973.
10. Salyer SJ, Silver R, Simone K, Barton Behraves C. Prioritizing zoonoses for global health capacity building-themes from One Health zoonotic disease workshops in 7 countries, 2014–2016. *Emerg Infect Dis* 2017 Dec;**23**(13):S55–64. <https://doi.org/10.3201/eid2313.170418>. PMID: 29155664; PMCID: PMC5711306.

S. Bellizzi*

Medical Epidemiologist, Independent Consultant, Geneva, Switzerland

G. Pichierri
Kingston Hospital NHS Foundation Trust, Microbiology Unit, Kingston
Upon Thames, United Kingdom

G. Canu
Polo Ospedaliero San Francesco, ASSLL, Nuoro, Italy

D. Dessi', C.M. Panu Napodano
University of Sassari, Sassari, Italy

* Corresponding author.
E-mail address: Saverio.bellizzi@gmail.com (S. Bellizzi).

3 May 2021

Available online 11 July 2021