




How far are we? National preparedness and response capacities for emerging infectious disease outbreaks in the WHO Eastern Mediterranean Region

Lubna Al Ariqi ¹, Evans Buliva,¹ Abrar Ahmad Chughtai ², Amal Barakat,¹ Chiori Kodama ¹, Wasiq Khan,¹ Muhammad Tayyab,¹ Sherein El Nossery,¹ Amir Aman,¹ Tamer El-Maghraby,¹ Amgad Elkholy,¹ Abdinasir Abubakar¹

To cite: Al Ariqi L, Buliva E, Chughtai AA, *et al.* How far are we? National preparedness and response capacities for emerging infectious disease outbreaks in the WHO Eastern Mediterranean Region. *BMJ Global Health* 2022;**7**:e009826. doi:10.1136/bmjgh-2022-009826

Handling editor Seye Abimbola

Received 7 June 2022
Accepted 3 July 2022



© Author(s) (or their employer(s)) 2022. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

¹Infectious Hazard Prevention and Preparedness Unit, World Health Organisation Regional Office for the Eastern Mediterranean, Cairo, Egypt
²School of Public Health and Community Medicine, University of New South Wales—Kensington Campus, Sydney, New South Wales, Australia

Correspondence to

Lubna Al Ariqi;
lubna.ariqi@hotmail.com

Infectious diseases are a constant threat to communities worldwide. Over the last decades, outbreaks of various emerging and epidemic-prone infectious diseases (EIDs) have erupted in the WHO Eastern Mediterranean Region.¹ Protracted humanitarian emergencies, fragile health systems, insufficient infrastructure and resources, suboptimal technical and managerial capacities further exacerbate disease emergence and spread and hinder prevention and control efforts.^{1 2} Despite these challenges, countries are committed to build national capacities to better tackle EIDs.

As such, the WHO's Eastern Mediterranean Regional Office (EMRO) spearheaded development of the *Strategic Framework for the Prevention and Control of EIDs in the Region*, with a vision to reduce their burden by 2024.³ The framework was developed through a consultative process from 2017 to 2020 to ensure that it is aligned with national needs and other strategies.⁴⁻⁹ While it sets out to strengthen core capacities required under the International Health Regulations (IHR) (2005), its main focus is profoundly tackling priority pathogens that pose a high and reoccurring threat to the Region. Systematic reviews were conducted to assess regional prevailing health threats, risk factors for disease transmission and inhibiting factors for disease prevention and control. Existing strategic documents, published reports, policies and guidelines developed by WHO and partners were also reviewed. After collecting this initial evidence, the first draft was prepared in 2018, in consultation with WHO Member States and technical experts, and circulated to various parties for technical revision. The draft was then presented to an intercountry

SUMMARY BOX

- ⇒ Ministries of Health in 22 countries of the WHO Eastern Mediterranean Region adopted the Strategic Framework for Prevention and Control of Emerging and Epidemic Prone Infectious Diseases in the Region for 2020–2024. To characterise the baseline national capacities pertaining to regional high-threat pathogens for monitoring implementation progress of this framework, an assessment was merited.
- ⇒ Countries in the Region reported varying levels of capacities, with relatively highest capacities in early detection and investigation of outbreaks and lowest capacities in prevention and preparedness. Countries experiencing humanitarian emergencies have reported relatively lower capacities across all areas.
- ⇒ The findings suggest that the 22 countries in the Region need to accelerate building their capacities to achieve the framework's 2024 endorsed target goals.

meeting in December 2018 for feedback.¹⁰ Over 100 representatives from health authorities, UN agencies, partner institutions and other experts participated. The framework was further revised and finalised with recommendations of technical experts. It was then endorsed by the 22 Ministries of Health (MOHs) at the 67th Regional Committee Meeting for the Eastern Mediterranean in October 2020.¹¹ Formal adoption of the framework by 22 countries confirms the Regional commitment to reducing burden of EIDs and is a promising start to achieving the 2024 goals.

Countries' public health and health security capacities were previously documented through assessments, such as the IHR State Party Self-Assessment Annual Report (SPAR) and Joint External Evaluation (JEE).⁴ This

preliminary data were used to set 2024 targets for each monitoring and evaluation indicator. To further characterise the specific capacities pertaining to regional high-threat pathogens for monitoring implementation progress of this framework, WHO EMRO conducted an assessment of baseline 2020 national prevention and preparedness, detection, response and knowledge management capacities, between January and April 2021. Questionnaires and a guide describing the 31 indicators were disseminated, through WHO country offices, to nationally nominated individuals in 22 MOHs to conduct the self-assessments. Online briefing sessions were arranged to present the tools and methodology. The nominated individuals completed the questionnaires in consultation with national stakeholders. The data were collated in the regional database and analysed against regional targets.

The active participation of 21 countries in this self-assessment further affirms the national commitment to improving specific capacities of the framework. The assessment demonstrated that the Region has relatively highest capacity in early detection of EID outbreaks, while its capacity for prevention and preparedness is the lowest and furthest away from the 2024 targets. In this commentary, we outline the reported capacities across the four dimensions and we provide guidance to governments, public health agencies, donors, academia and the public health community on areas of focus for capacity building in upcoming years, in order to achieve set targets of the regionally-adopted framework.

Prevention and preparedness to EID outbreaks has been documented as a proven cost-effective strategy to mitigate associated morbidity and mortality¹²; yet, we observe that this dimension is one in which the Region is furthest from target. After the 2009 H1N1 pandemic, many countries rushed to develop influenza pandemic preparedness plans.⁷ However, those plans were generally not tested and resources were not allocated for various activities. The findings of this assessment further demonstrate that no EMR country was fully prepared for a pandemic, and the rapid evolution of COVID-19 epidemics confirmed that. For instance, 15 countries reported having developed/updated an integrated preparedness plan for priority high-risk diseases, but only 5 have tested it. Moreover, an often-overlooked element of preparedness is coordination mechanisms between animal, human, food and environment sectors. Merely half the Region reported having a formal One Health coordination mechanism. As most EIDs are of zoonotic origin,¹³ MOHs should adopt the One Health approach and work closely with relevant non-health sectors,¹⁴ especially in regularly sharing epidemiological and laboratory data. Additionally, countries need to maintain the trained multisectoral rapid response teams at national level and expand them to subnational levels.

Regional capacities in *early detection* of outbreaks are highest scoring compared with other dimensions. This includes availability of national laboratory diagnostic

capacity and networks together with standard operating procedures (SOPs) for specimen referral, data sharing, quality and biosafety control. Additionally, the establishment of early warning and response network (EWARN) in seven countries experiencing humanitarian emergencies is an accomplishment for the Region. Nevertheless, these capacities for detecting, reporting and confirming outbreaks need to be complemented by efficient disease surveillance systems, including both indicator based and event based, for faster detection and response. A strong example of such surveillance is the influenza surveillance. However, despite this system's establishment in 19 countries, almost half still reported no real-time electronic platforms for other notifiable diseases. Efforts should be made to strengthen real-time surveillance, including strengthening the early warning function and the joint investigation and rapid risk assessment at the animal-human interface for emerging zoonotic pathogens. The COVID-19 pandemic played a significant role in improving early detection and investigation of EID outbreaks; it is now vital to sustain these capacities and networks in strategic and inclusive ways, accounting for integration whenever possible.

With regards to *response* to outbreaks, the Region's reported capacities were close to the 2024 target, yet far from their highest attainable quality in absolute terms. The indicator scoring highest was development/update of SOPs and guidelines for surveillance and conduct of integrated field investigations. Nevertheless, the implementation of a national strategy/plan for control of vector-borne EIDs and the systematic assessment of quality and effectiveness of response operations were reported suboptimal. Countries would greatly benefit now from conducting after/interaction reviews of their epidemic and pandemic responses and paving a national strategy forward with high political commitment across the board. This commitment shall also encompass investments into seasonal influenza vaccines⁷ and their integration into routine immunisation. Policies/programmes for vaccination against seasonal influenza were reported in two-thirds of the Region in the assessment; despite this, influenza vaccine coverage remains low, particularly among healthcare workers and pregnant women.¹⁵ To that end, the existing policies merit a critical review and update. Furthermore, the assessment has demonstrated that regional capacities in risk communication are substantially low. Countries are advised to develop, update and test emergency risk communication strategy/plans for EIDs and maintain capacities rapidly set up during the COVID-19 pandemic.

As for *knowledge management and innovation*, the framework sets relatively low 2024 targets, as at the time, this was a new dimension proposed to be explored as a significant pillar to tackling EID outbreaks. Hence, the assessment was fruitful in demonstrating available in-country capacities. While target goals are near-reach, the absolute capacities are yet to be enhanced. Of utmost importance is investment in epidemiological research, examples

of which include conducting disease and economic burden studies, particularly on diseases for which effective countermeasures exist (eg, influenza). Operational research is equally important; a regional priority of interest was set to be assessments of the effectiveness of non-pharmaceutical prevention and control strategies. Nevertheless, national research prioritisation with communication and collaboration between MOHs and academia is essential to identify key domestic knowledge gaps and translate research findings to practice. Finally, to cultivate innovation and advance knowledge, countries are advised to encourage their public health workforce to participate in exchange research programmes and conferences, regionally and internationally.

Of the 21 countries in the assessment, 11 have been experiencing one or more natural/manmade humanitarian emergencies. These emergencies adversely affected countries' health systems and their ability to control infectious diseases. As such, these countries are far less equipped to manage EID outbreaks and, ultimately, there is an imperative need to improve their capacities.

In conclusion, findings of this WHO assessment bear important implications and are an urgent call for action, if the Region is to achieve the 2024 endorsed target goals. It is important to note that the reported baseline figures are mere proxies of the organic capacities. This is due to the self-assessment nature the exercise employed and its administration during an unsettling time period in which the COVID-19 epidemics were erupting regionally. In this period, several structures and initiatives were established ad hoc and may not be sustained. Near-future validations are planned via steering committee meetings, stakeholder and expert consultations, external evaluations and other comparison with complementary assessments (eg, IHR SPAR and JEE). WHO will continue to meet with MOHs to review progress and challenges in implementation of the endorsed framework and support in building their capacities for achieving its 2024 targets.

Contributors LAA, EB, AA conceptualised the work and designed the methodology. AAC, LAA developed data collection tools and analysis plan. AAC, LAA, EB, AA supported data collection. AAC cleaned and analysed the data and developed the draft technical report. LAA, EB, AB, CK, WK, MT, SEN, AA, TE-M, AE, AA provided critical technical inputs during development of data collection tools, data analysis plan and result interpretation. LAA developed the commentary and all authors contributed to its content. AA supervised the project.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Not applicable.

Ethics approval Not applicable.

Provenance and peer review Not commissioned; internally peer reviewed.

Data availability statement Data have been collected from Ministries of Health across 21 countries. Due to data confidentiality agreement with countries, de-

identified countries' data cannot be released. Regional aggregated estimates are available upon request.

Open access This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

ORCID iDs

Lubna Al Ariqi <http://orcid.org/0000-0002-3343-6359>

Abrar Ahmad Chughtai <http://orcid.org/0000-0003-4203-7891>

Chiiori Kodama <http://orcid.org/0000-0003-3434-5448>

REFERENCES

- Buliva E, Elhakim M, Tran Minh NN, *et al*. Emerging and reemerging diseases in the world Health organization (who) eastern Mediterranean Region-Progress, challenges, and who initiatives. *Front Public Health* 2017;5:276.
- Mostafavi E, Ghasemian A, Abdinasir A, *et al*. Emerging and re-emerging infectious diseases in the who eastern Mediterranean region, 2001-2018. *Int J Health Policy Manag* 2021. doi:10.34172/ijhpm.2021.13. [Epub ahead of print: 06 Mar 2021].
- WHO Regional Office for the Eastern Mediterranean. *Strategic framework for the prevention and control of emerging and epidemic-prone infectious diseases in the eastern Mediterranean region 2020-2024*. Cairo: WHO Regional Office for the Eastern Mediterranean, 2020. <https://applications.emro.who.int/docs/9789290226161-eng.pdf?ua=1>
- World Health Organization. *International health regulations (2005)*. 3rd ed, 2016. <https://apps.who.int/iris/bitstream/handle/10665/246107/9789241580496-eng.pdf>
- WHO Regional Office for the Eastern Mediterranean. 2019. WHO's strategy for the Eastern Mediterranean Region, 2020–2023: Turning Vision 2023 into action. Available: <http://www.emro.who.int/about-who/vision2023/vision-2023.html>
- World Health Organization. Global vector control response 2017–2030, 2017. Available: <https://www.who.int/publications/i/item/9789241512978>
- World Health Organization. Global influenza strategy 2019–2030, 2019. Available: <https://apps.who.int/iris/handle/10665/311184>
- Global Task Force on Cholera Control. Ending cholera: a global roadmap to 2030, 2017. Available: <https://www.gtfcc.org/wp-content/uploads/2020/09/ending-cholera-a-global-roadmap-to-2030.pdf>
- World Health Organization. Defeating meningitis by 2030: a global road map, 2021. Available: <https://www.who.int/publications/i/item/9789240026407>
- WHO regional office for the eastern Mediterranean, 2019. Intercountry meeting on the strategic framework for prevention and control of emerging and epidemic-prone diseases in the eastern Mediterranean region. Amman, Jordan 16–19 December 2018. Available: <https://apps.who.int/iris/handle/10665/325825>
- World Health organization eastern Mediterranean regional office, 2020. resolution EM/RC67/R1: regional Committee for the eastern Mediterranean Sixty-Seventh session agenda item 3. Available: <https://applications.emro.who.int/docs/EMRC67R1-eng.pdf?ua=1>
- International Working Group on Financing Preparedness, 2017. rom Panic and Neglect to Investing in Health Security: Financing Pandemic Preparedness at a National Level. *World Bank*. Available: <https://openknowledge.worldbank.org/handle/10986/26761>
- Morens DM, Folkers GK, Fauci AS. The challenge of emerging and re-emerging infectious diseases. *Nature* 2004;430:242–9.
- Mackenzie JS, Jeggo M, Daszak P, eds. *One Health: The human-animal-environment interfaces in emerging infectious diseases*. Vol. 366. Springer, 2013. <https://link.springer.com/book/10.1007/978-3-642-35846-3>
- Zaraket H, Melhem N, Malik M, *et al*. Review of seasonal influenza vaccination in the eastern Mediterranean region: policies, use and barriers. *J Infect Public Health* 2020;13:377–84.