

# COVID-19 and Dengue: A potentially emerging healthcare challenge for Pakistan

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Pakistan is facing the third wave of the SARS-CoV-2 pandemic and could head towards the fourth one. Although the burden of COVID-19 remained significantly low in the country as compared to its neighboring countries despite similar gene pool, health system, and climatic conditions, still Pakistan has dealt with the disease with relative effectiveness. The pandemic imposed immense pressure on the public health systems due to increased demand for specialized isolation wards and intensive care units and disease-related morbidity and mortality. Many of the tertiary care hospitals in the major pandemic-stricken districts have been transformed into specialized centers dedicated to the treatment of COVID-19. This resulted in diverting major hospital resources and manpower to deal with the pandemic at the cost of other medical and surgical conditions. A recent pulse survey conducted by World Health Organization (WHO) in 135 countries demonstrated that the SARS-CoV-2 pandemic severely affected the global health services, while services for endemic tropical diseases (like dengue) were affected in 44% of countries, especially in resource-limited countries. Moreover, large-scale community-based interventions including vector surveillance and control were disrupted in 60% of the countries.<sup>1</sup> Another survey by WHO on malaria control in sub-Saharan Africa demonstrated a >20% increase in malaria cases and a doubling of malaria-associated deaths due to a decline in malaria control activities during the pandemic. It is expected that the future catastrophe due to malaria might be much greater than the COVID-19 in endemic regions. Therefore, WHO recommends continuous monitoring, surveillance, and treatment to control the spread of malaria.<sup>2</sup>

Measures must also be taken on an urgent basis to control dengue in endemic countries. Dengue is responsible for about 100 million symptomatic cases and 10,000 deaths annually with the highest burden in Southeast Asia. The number of new cases of dengue has been doubling every decade since 1990 around the globe.<sup>3</sup> Dengue not only inflicts a burden on the fragile

health systems in low- and middle-income countries like Pakistan but also impose a financial burden on the households.<sup>4</sup> The disruption of surveillance and control of dengue vectors around the globe might result in an upsurge in dengue cases. Many countries like Paraguay, Mexico, Bolivia, and Honduras reported a two to three times increase in the cases of dengue during the COVID-19 pandemic in 2020 than for the same period in 2019.<sup>5</sup> Dengue has become endemic in Pakistan as well and several large-scale epidemics have been reported in the major metropolitan cities (including Karachi, Lahore, Faisalabad, Peshawar, Rawalpindi, etc.) since 1990. Each year number of dengue cases starts to rise after monsoon rainfall starting from July-August, creating conducive climatic conditions (i.e. rise in humidity with a concomitant decline in temperature) for the proliferation of the dengue vector population. A recent study demonstrated the inability of the mosquitoes to transmit SARS-CoV-2 to humans.<sup>6</sup> However, higher population densities support the transmission of both dengue virus and SARS-CoV-2 infections. On the contrary, dengue surveillance and control have been largely ignored during the pandemic by the public health experts in Pakistan. Currently, the field staff of the dengue control program has been utilized for COVID-19 vaccination campaigns. Personal communication with the entomologists revealed that a high number of larvae of the dengue vector have been detected from various towns in Lahore.

It is also well known that preexisting comorbidities are a risk factor for the development of severe disease.<sup>7</sup> Co-infections with SARS-CoV-2 and dengue virus have been reported from Brazil and Singapore.<sup>8,9</sup> Both diseases may share similar clinical, and laboratory features thus presenting a diagnostic challenge in dengue-endemic countries. There is thus a need to remain vigilant about this coexistence. Serological cross-reactivity of dengue and COVID-19 has also been reported which may result in an increase in false-positive cases of either disease.<sup>10</sup> This means more sophisticated molecular tests will be required to confirm the type of infection. Recently, the Dengue Expert Advisory Group, Punjab has formulated

guidelines for the assessment of dengue in the COVID-19 pandemic outlining the clinical features for differential diagnosis of both diseases.<sup>11</sup> According to the assessment criteria, the patients will be finally confirmed through PCR for COVID-19 and serodiagnosis for dengue. Keeping in view the reports of serological cross-reactivity of dengue virus and SARS-CoV-2, the clinicians are strongly advised to keep high suspicion of COVID-19 in case of positive serology for dengue and to correlate the results with clinical signs and symptoms.

Community participation remains pivotal in the control of vector-borne diseases (malaria, dengue, and others). The public must be sensitized about the emerging issue to act and play their role in controlling the mosquito population. A public health awareness message regarding COVID-19 has already been played on every phone call which could be modified to include a message regarding mosquito control measures as well. The community must be encouraged to take care of in and outside of their households, and to reduce any potential mosquito breeding sites including draining of any stagnant water (especially air coolers, fridge trays, etc.), removing any wastes and containers that fill with rainwater, and ensuring covering of any storage tanks. It is also important that such activities must be conducted on weekly basis in the dengue season. Inside the houses, insecticides must be sprayed, preferably on dark surfaces and under furniture to kill adult mosquitoes. Vulnerable populations including, the elderly, children, pregnant females, immunocompromised, and those with any underlying medical condition must be encouraged to use repellents to avoid mosquito bites. In addition, care must also be taken for empty buildings (educational institutes, building under construction, etc.) and those do not belong to anyone (i.e. Government buildings). Innovative technologies like drones could be used for surveillance of these buildings and to destroy the mosquito breeding sites.

Considering the existing situation there are potentially high chances of dengue spread in parallel to the ongoing COVID-19 pandemic in endemic regions of Pakistan. Therefore, an integrated approach including the resumption of surveillance and control

activities of the dengue control program, and community participation are the need of time to avoid any further burden on the already fragile health system.

## REFERENCES

1. WHO. NTDs: pulse survey shows COVID-19 continues to disrupt health services Geneva: World Health Organization 2021 [updated 29 April 2021; cited 2021 30 April 2021]. Available from: <https://www.who.int/news/item/29-04-2021-ntds-pulse-survey-shows-covid-19-continues-to-disrupt-health-services>.
2. Rahi M, Das P, Sharma A. COVID-19 mitigation steps provide a blueprint for malaria control and elimination. *Am J Trop Med Hyg.* 2020;103(1):28-30.
3. Stanaway JD, Shepard DS, Undurraga EA, Halasa YA, Coffeng LE, Brady OJ, et al. The global burden of dengue: an analysis from the Global Burden of Disease Study 2013. *Lancet Infect Dis.* 2016;16(6):712-23.
4. Wilder-Smith A, Ooi E-E, Horstick O, Wills B. Dengue. *The Lancet.* 2019;393(10169):350-63.
5. Pan American Health Organization / World Health Organization. Epidemiological Update: Dengue Washington, D.C. 2020 [updated 7 February 2020]. Available from: [https://www3.paho.org/hq/index.php?option=com\\_docman&view=download&category\\_slug=dengue-2217&alias=51690-7-february-2020-dengue-epidemiological-update-1&Itemid=270&lang=en](https://www3.paho.org/hq/index.php?option=com_docman&view=download&category_slug=dengue-2217&alias=51690-7-february-2020-dengue-epidemiological-update-1&Itemid=270&lang=en).
6. Huang Y-JS, Vanlandingham DL, Bilyeu AN, Sharp HM, Hetttenbach SM, Higgs S. SARS-CoV-2 failure to infect or replicate in mosquitoes: an extreme challenge. *Sci Rep.* 2020;10(1):11915.
7. Pang J, Salim A, Lee VJ, Hibberd ML, Chia KS, Leo YS, et al. Diabetes with hypertension as risk factors for adult dengue hemorrhagic fever in a predominantly dengue serotype 2 epidemic: a case control study. *PLoS Negl Trop Dis.* 2012;6(5):e1641.
8. Rodriguez-Morales AJ, Gallego V, Escalera-Antezana JP, Méndez CA, Zambrano LI, Franco-Paredes C, et al. COVID-19 in Latin America: The implications of the first confirmed case in Brazil. *Travel Med Infect Dis.* 2020;35:101613.
9. Verduyn M, Allou N, Gazaille V, Andre M, Desroche T, Jaffar M-C, et al. Co-infection of dengue and COVID-19: A case report. *PLoS Negl Trop Dis.* 2020;14(8):e0008476.
10. Masyeni S, Santoso MS, Widyarningsih PD, Asmara DGW, Nainu F, Harapan H, et al. Serological cross-reaction and coinfection of dengue and COVID-19 in Asia: Experience from Indonesia. *Int J Infect Dis.* 2021;102:152-4.
11. DEAG. Assessment of dengue in COVID –19 pandemic Lahore2021 [cited 2021 10 July]. Available from: [https://deag.punjab.gov.pk/system/files/Assessment%20of%20Dengue%20in%20COVID%20%E2%80%93%2019%20Pandemic.pdf#overlay-context=download\\_links](https://deag.punjab.gov.pk/system/files/Assessment%20of%20Dengue%20in%20COVID%20%E2%80%93%2019%20Pandemic.pdf#overlay-context=download_links).