

COVID-19 and dengue virus coepidemics in Pakistan: A dangerous combination for an overburdened healthcare system

To the Editor,

We have read recent articles regarding coepidemics/coinfections of COVID-19 and other infectious diseases,¹⁻⁴ these reports highlight the impact of coinfections on the health care system. The recent pandemic of COVID-19 caused by a novel severe acute respiratory syndrome coronavirus (SARS-CoV-2) has taken 378 K lives and has spread worldwide infecting over 6.3 million individuals. The number of COVID-19 in Pakistan has been escalating at a rapid rate (76 000) and has caused 1621 deaths so far.⁵ Simultaneously, in the coming days, the country might also be facing the outbreak of dengue fever, a viral disease that is known to be transmitted by *Aedes aegypti* and *Aedes albopictus* mosquitoes.⁶ According to Federal Disease Surveillance and Response Unit Field Epidemiology and Disease Surveillance Division National Institute of Health (NIH), Pakistan, dengue infection is continuously on the rise from last 3 years (Figure 1A).⁷ The NIH data showed that in last year the number of cases started to rise from March and peaked in September and October infecting 24,547 people in the year 2019 only (Figure 1B).⁷ The incidence of dengue around the globe has increased dramatically, estimating 100 to 400 million infections per year.⁸ More number of dengue cases are reported in the rainy and summer season (April to March and then from August to October). Meanwhile, an increase in respiratory system-related complications is also arising in this period of the year, COVID-19 is yet to reach its peak during the coming days in Pakistan. This temporal coincidence suggests that the two disease outbreaks might occur at the same time implying that it would have drastic effects on the population as well as the economy. In such conditions, public and private health sector departments must work together to overcome this health nemesis.

COVID-19 and dengue fever are difficult to discriminate because they share clinical manifestations and laboratory features.⁹ Some authors have discussed cases that were first wrongly diagnosed with dengue but later tested positive for COVID-19.¹⁰ SARS-CoV-2 has a severe impact on world economy¹¹ and due to several potential unnoticed transmission routes, it will test the health care system for a longer time.¹² Keeping in view the fragile condition of Pakistan's healthcare system and the complex epidemiological

scenario, Pakistan is at the brink of multiple socioeconomic collapses. The lack of a sufficient amount of specific diagnostic tests and late detection of viruses might result in viral importation and difficult to stop it from spreading, leaving uncounted and undetected positive cases. The actual number of infections is suspected to be much higher than it is reported. Another grave concern is inadequate public healthcare infrastructure which is understaffed and underfunded. According to the Economic Survey of Pakistan 2018 to 2019, there is one doctor available for 963 patients and one hospital bed for 1608 individuals, with a very low scale availability of intensive care units.¹³ COVID-19 alone, if peaks as much as in the European countries have insurmountable capacity to overburden the healthcare system of Pakistan. In such a condition, if this pandemic is accompanied by dengue fever, the burden would be even greater.

Pakistan, with economic and healthcare professionals' limitations, is struggling hard to cope with COVID-19. However, the vast majority of cases are asymptomatic and the limited number of tests might leave some undetected cases wandering and infecting other individuals that might result in a cluster of infections. Therefore, to restrain the epidemic, drastic measures should be taken: large investment in epidemiological, diagnostic, and vaccine development research, medical and protective supplies are required to tackle the epidemic efficiently. Active surveillance, viral identification assays, and disinfecting large areas should be prioritized to detect and limit the transmission of viruses. A combination of these measures may help to gain insight into the actual number of infected cases thus isolating them and limiting the spread of viruses.

CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

AUTHOR CONTRIBUTIONS

All authors conceived the study, discussed the results, drafted the first manuscript, critically read and revised the manuscript, and gave final approval for publication.

DATA AVAILABILITY STATEMENT

All data and materials used in this work were publicly available.

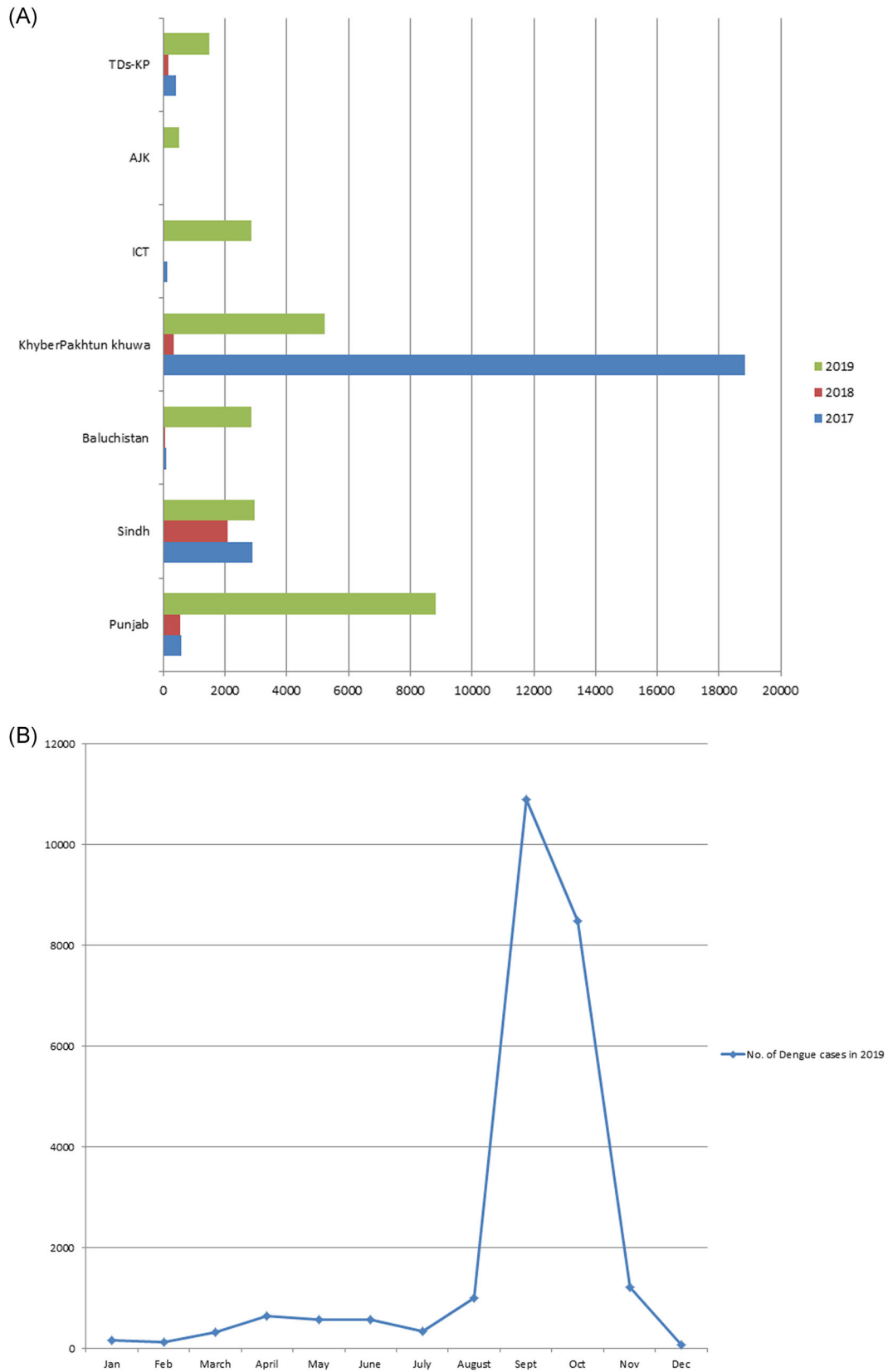


FIGURE 1 A, Distribution of dengue virus confirmed cases in various provinces of Pakistan (2017-2019). B, Number of dengue virus confirmed cases in Pakistan (2019)⁷

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REFERENCES

- Gayamayam V, Konala VM, Naramala S, et al. Presenting characteristics, comorbidities, and outcomes of patients coinfecting with COVID-19 and *Mycoplasma pneumoniae* in the USA. *J Med Virol.* 2020; 1-7. <https://doi.org/10.1002/jmv.26026>
- Ding Q, Lu P, Fan Y, Xia Y, Liu M. The clinical characteristics of pneumonia patients coinfecting with 2019 novel coronavirus and influenza virus in Wuhan, China. *J Med Virol.* 2020;1-7. <https://doi.org/10.1002/jmv.25781>
- Ribeiro VST, Telles JP, Tuon FF. Arboviral diseases and COVID-19 in Brazil: Concerns regarding climatic, sanitation and endemic scenario. *J Med Virol.* 2020. <https://doi.org/10.1002/jmv.26079>
- Li Z-t, Chen Z-m, Chen L-d, et al. Coinfection with SARS-CoV-2 and other respiratory pathogens in COVID-19 patients in Guangzhou, China. *J Med Virol.* 2020. <https://doi.org/10.1002/jmv.26073>
- World Health Organization. 2020. <https://www.who.int/emergencies/diseases/novelcoronavirus-2019/situation-reports/>. Accessed June 02, 2020.
- Khanhan E, Hasan R, Mehraj V, et al. Co-circulations of two genotypes of dengue virus in 2006 out-break of dengue hemorrhagic fever in Karachi, Pakistan. *J Clin Virol.* 2008;43:176-179. <https://doi.org/10.1016/j.jcv.2008.06.003>
- National Institute of Health. 2020. <https://www.nih.org.pk/2019/12/49-FELTP-Pakistan-Weekly-Epidemiological-Report/>. Accessed May 15, 2020.
- World Health Organization. 2020. <https://www.who.int/news-room/fact-sheets/detail/dengue-and-severe-dengue/>. Accessed May 15, 2020.
- Chenhen N, Zhou M, Dong X, et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. *Lancet.* 2020;395:507-513. [https://doi.org/10.1016/S0140-6736\(20\)30211-7](https://doi.org/10.1016/S0140-6736(20)30211-7)
- Yan G, Lee CK, Lam LT, et al. Covert COVID-19 and falsepositive dengue serology in Singapore. *Lancet Infect Dis.* 2020;20(5):536. [https://doi.org/10.1016/S1473-3099\(20\)30158-4](https://doi.org/10.1016/S1473-3099(20)30158-4)
- Kabir M, Afzal MS, Khan A, Ahmed H. COVID-19 pandemic and economic cost: impact on forcibly displaced people. *Travel Med Infect Dis.* 2020;101661. <https://doi.org/10.1016/j.tmaid.2020.101661>
- Ali M, Zaid M, Saqib MAN, Ahmed H, Afzal MS. SARS-CoV-2 and the hidden carriers - sewage, feline, and blood transfusion. *J Med Virol.* 2020. <https://doi.org/10.1002/jmv.25956>
- Ministry of Finance. 2020. http://www.finance.gov.pk/survey_1819.html/. Accessed May 15, 2020.