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Dr. Shalini Garg

Editor-in-Chief

The Lancet Regional Health – Southeast Asia

**Subject: Manuscript on Bangladesh dengue outbreak in 2023**

**Dr. Shalini Garg,**

Please find attached our manuscript “The 2023 Fatal Dengue Outbreak in Bangladesh Highlights a Paradigm Shift of Geographical Distribution of Cases” for consideration as a “Research article” in *Lancet Regional Health- Southeast Asia*.

In 2023, the world witnessed the first landmark of 6000 annual deaths due to dengue virus infection and Bangladesh recorded more than one-fourth of the total fatalities (n=1705). We worked with the Ministry of Health and Family Welfare of Bangladesh (Management Information System) on the dataset of 321,179 confirmed dengue cases and 1705 deaths to characterize the outbreak pattern and transmission dynamics in the country.

In 2023, there were 1.3 times as many reported cases of dengue fever as there were in the previous 23 years, from 2000 to 2022 (321,179 vs. 244,246), and there were twice as many deaths (1705 vs. 849). Of the 1705 fatalities, 67.4% (n=1015) passed away a day after being admitted to the hospital, suggesting that individuals with serious illnesses were admitted later than necessary. We believe these findings need special attention from the authorities in Bangladesh, South/Southeast Asia, and other countries with similar economic development where medical treatment is highly dependent on large cities. This information will be also useful for WHO, CDC, ECDC, and other jurisdictions to modify/develop the guidelines for dengue infection.

A total of 110,008 cases, including 980 deaths (case-fatality ratio: 0.89%), were recorded from the capital City of Dhaka, whereas 211,171 cases, including 725 deaths (case-fatality ratio: 0.34%), were reported from outside the city. More than half of the cases—only the second such instance in Bangladesh after 2019—were reported outside of Dhaka. Dengue incidence per thousand people was greater in the southern divisions to central Dhaka than in the northern division (2.30 vs. 0.50, p<0,0.01). This higher incidence can be explained by the higher mean annual temperature in the southern divisions than in the northern division (27.46 vs. 26.54 °C). There was a positive correlation between dengue cases in each division and the average temperature (IRR: 1.13, 95% CI: 1.11-1.14) and the divisions' urban-to-rural population ratio (IRR: 1.04, 95% CI: 1.03-1.04).

In contrast to the idea of an urban disease, dengue poses a significant threat to rural communities in Bangladesh. The largest Muslim festival Eid-Al-Adha coincided when an epidemic that was ongoing in the Capital city, Dhaka. Many people (~15 million) left Dhaka and its surrounding cities to celebrate Eid-Al-Adha with their families in rural Bangladesh. This large movement probably played a role in spreading the DENV throughout the county. Our study showed the higher incidence and CFR of the district southern to the central capital city, Dhaka, and the incidence was associated with higher temperatures, urbanization, and humidity.

We have discussed the public health challenges for controlling future outbreaks of the dengue virus in Bangladesh. All authors reviewed the article and provided their consent for journal submission. We do not have any conflict of interest. This manuscript has not been published and is not under consideration for publication elsewhere. If you feel that the manuscript is appropriate for your journal, we suggest the following potential reviewers for the manuscript:

1. Dr Timothy P Endy ([endyt@upstate.edu](mailto:endyt@upstate.edu)), Infectious Disease Division, Department of Medicine, State University of New York, Upstate Medical University, Syracuse, NY, USA,

**Reason:** The corresponding author of “Burden of symptomatic dengue infection in children at primary school in Thailand: a prospective study”, https://doi.org/10.1016/S0140-6736(07)60671-0

1. Dr Thomas Jaenisch ([thomas.jaenisch@uni-heidelberg.de](mailto:thomas.jaenisch@uni-heidelberg.de)), Heidelberg Institute of Global Health (HIGH), Heidelberg University Hospital, Heidelberg 69120, Germany,

**Reason:** The corresponding author of “Early diagnostic indicators of dengue versus other febrile illnesses in Asia and Latin America (IDAMS study): a multicentre, prospective, observational study”, https://doi.org/10.1016/S2214-109X(22)00514-9

1. Dr Derek Wallace ([derek.wallace@sanofipasteur.com](mailto:derek.wallace@sanofipasteur.com)), Asia-Pacific Clinical Development, Sanofi Pasteur, Singapore,

**Reason:** The corresponding author of “Protective efficacy of the recombinant, live-attenuated, CYD tetravalent dengue vaccine in Thai schoolchildren: a randomised, controlled phase 2b trial”, https://doi.org/10.1016/S0140-6736(12)61428-7

1. Buddha Basnyat ([buddha.basnyat@ndm.ox.ac.uk](mailto:buddha.basnyat@ndm.ox.ac.uk)), Oxford University Clinical Research Unit, Patan Hospital, Kathmandu, Nepal, Centre for Tropical Medicine and Global Health, Nuffield Department of Medicine, Oxford University, Oxford, UK,

**Reason:** The corresponding author of “Preparing for the dengue explosion in Kathmandu, Nepal” https://doi.org/10.1016/S2214-109X(20)30007-3

1. Basu Dev Pandey ([basudevpandey@nagasaki-u.ac.jp](mailto:basudevpandey@nagasaki-u.ac.jp)), Department of Molecular Epidemiology, Institute of Tropical Medicine, Nagasaki University, Nagasaki 852-8523, Japan,

**Reason:** The corresponding author of “Struggling with a new dengue epidemic in Nepal”, https://doi.org/10.1016/S1473-3099(22)00798-8

1. Anthony Costello ([anthony.costello@ucl.ac.uk](mailto:anthony.costello@ucl.ac.uk)), Global Health and Sustainable Development, University College London, London WC1N 1EH, UK,

**Reason:** The corresponding author of “The dengue epidemic and climate change in Nepal”, https://doi.org/10.1016/S0140-6736(19)32689-3

1. Oliver J Brady ([oliver.brady@lshtm.ac.uk](mailto:oliver.brady@lshtm.ac.uk)), Department of Infectious Disease Epidemiology, London School of Hygiene and Tropical Medicine, London WC1E 7HT, UK,

**Reason:** The corresponding author of “Dengue virus on the rise in Nepal”, https://doi.org/10.1016/S1473-3099(20)30445-X

1. David Gozal ([gozald@health.missouri.edu](mailto:gozald@health.missouri.edu)), Department of Child Health and the Child Health Research Institute, The University of Missouri School of Medicine, Columbia, MO 65201, USA,

**Reason:** The corresponding author of “The dengue epidemic in Bangladesh: risk factors and actionable items”, https://doi.org/10.1016/S0140-6736(19)32524-3

1. Beth D Kirkpatrick ([beth.kirkpatrick@med.uvm.edu](mailto:beth.kirkpatrick@med.uvm.edu)), UVM Vaccine Testing Center, Department of Microbiology and Molecular Genetics, University of Vermont Larner College of Medicine, Burlington, VT, USA, Department of Medicine, University of Vermont Larner College of Medicine, Burlington, VT, USA,

**Reason:** The corresponding author of “Safety and durable immunogenicity of the TV005 tetravalent dengue vaccine, across serotypes and age groups, in dengue-endemic Bangladesh: a randomised, controlled trial”, https://doi.org/10.1016/S1473-3099(23)00520-0

1. Annelies Wilder-Smith ([anneliesws@gmail.com](mailto:anneliesws@gmail.com)), Heidelberg Institute of Global Health, University of Heidelberg, 69120 Heidelberg, Germany,

**Reason:** The corresponding author of “The Dengue-in-Dhaka Initiative: results from a phase 2 trial evaluating the TV005 tetravalent dengue vaccine in Bangladesh”, https://doi.org/10.1016/S1473-3099(23)00565-0

Thank you for considering our submission.

**Kind regards,**

Najmul Haider, PhD, MPH, MSc, DVM

Lecturer in Epidemiology

School of Life Sciences, Keele University,

Staffordshire, United Kingdom, ST5 5BG, Email: [n.haider@keele.ac.uk](mailto:n.haider@keele.ac.uk)