Dengue is a rapidly expanding mosquito-borne virus that can be found in tropical and subtropical climates (Rodríguez-Barraquer et al., 2015). Across a human population, it is endemic in more than 100 countries and 400 million people are infected with it annually. Around 100 million shows symptoms and 40 thousand dies from severe dengue due to internal bleeding and organ damage (CDC, 2021a). There are four serotypes that cause the dengue disease – DENV-1, DENV-2, DENV-3, and DENV-4. They are spread by two vector species — mosquitos *Aedes aegypti* and *Aedes albopictus* — which survive well in both tropic and cooler regions (15-320C) (Reinhold et al, 2018). While mild symptoms of dengue cause fever, aches, and rash, the severe form of dengue — Dengue Hemorrhagic Fever (DHF) — can cause death within a few hours and requires hospital care (CDC, 2021a). Since dengue can be induced by four genetically related viruses, a single person does not develop immunity to all at once and is at risk of getting sick as many as four times in their lifetime. Although a new dengue vaccine has recently become available on the U.S. territories (CDC 2021b), there has not yet been developed a long-lasting, successful, and widely accessible vaccine (Rodríguez-Barraquer et al., 2015). The disease requires urgent and special attention to reduce high infection rates across the world.

India, a country of 1.42 billion people (World Population Review, 2023) with a tropical monsoon climate (Mutheneni et al., 2017), has had a continuous presence of dengue in endemic stage over two centuries. Recent studies suggest that there is a high probability of dengue occurrence in most of the Indian subcontinent while only a small fraction of cases is diagnosed and reported due to the insu cient testing rates (Rodr²guez-Barraquer, 2015). Hence, a yearly average for mortality is 212, and for morbidity is 140 thousand people (NCVBDC, 2021). Currently, the only way to e ectively decrease the number of active infections is to prevent mosquito bites (CDC, 2021a). This poses a challenge due to the current state of India's economy. As of 2021, 97 million people live in extreme poverty (The Global Statistics, 2021). Besides having housing in livable conditions, these peo-

to ýght the pandemic, India is now facing the worsening of the dengue epidemiological proýle in the country (Phadke et al., 2021). Due to the similarities between the nonspeciýc symptoms of the disease, patients are a subject to misdiagnosis. Improper treatment given to the patient because of misdiagnosis can be fatal for the patient. One drug used to prevent thrombosis in COVID patients, LMWH, substantially increases the risk of internal bleeding if given to a dengue patient (Phadke et al., 2021).

The epidemic of dengue has been present in India over the centuries, overlapping and worsening with the currently ongoing COVID-19 pandemic. The greatest challenge posed to the public health system in ýghting the disease is the lack of exact data on morbidity and mortality of the disease. Knowing where the cases are least spotted in the country may indicate insu cient data collection rather than low infection rates. Further research can help estimate the key transmission parameters and aid in exploring the factors associated with dengue seroprevalence. It may help to predict the areas of future outbreaks and localize the most a ected groups due to the cultural, economic, and social factors. One of the ways to decrease the gender ratio disparity in dengue cases is to target speciýc groups with education about the issue.

The distribution of dengue in the cities and villages highlights the importance to have a better understanding of another factor – mobility, to localize where the intervention can be most successful. From the geographical perspective, the special environmental and climatic factors make India a critical area for dengue. Temperature and precipitation are key enviro-climatic factors in estimating mosquito's population development and disease transmission dynamics (Reinhold et al., 2018). High temperatures (up to 35 0C) and high humidity have shown to directly impact the development and range of mosquitos, as well as the incubation period of the dengue viruses themselves. Under high temperatures, the lifespan of adult Aedes mosquito species and the number of their reproductive cycles increases. They also spend less time on blood-feeding, which in combination with shorter viral incubation time leads to faster virus replication and increased transmission intensity. While global warming is expected to increase the average temperatures in all parts of the world, the burden of dengue in India might vary in each region. Some states, like Punjab, Gujarat and Kenala, known for its high temperature and humidity levels, may experience a decrease in dengue cases due to the temperatures being too high for the mosquitos to survive. Hence, the species distribution in the country may change and expose more people to the vector-borne infection (Malkina, 2021).

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