

# Flooding and Change of COVID-19 Incidence: an Observation

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## Letter to the Editor

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COVID-19 is still a major public health issue around the world. The pandemic is still going on and there is a problem all across the world. Annually, there are also other problems in various parts of the world. Natural disasters are another major issue that may affect a large area and many people. The interrelationship between natural disasters and COVID-19 is an interesting issue in disaster medicine, but it is rarely discussed. Han *et al.* noted that flooding could exacerbate the spread of COVID-19.<sup>1</sup> Shen *et al.* proposed that analysis of the relationship between flooding and COVID-19 could aid in the handling of both public emergencies.<sup>2</sup> Here, the authors would like to share data from a tropical area where COVID-19 has existed since January, 2021, and typhoons are a common natural hazard. In this area, lockdown policies have been employed to contain disease outbreaks. Here, the authors share observations on flooding and change of COVID-19 incidence. The area is a tropical area (GPS location 17.0055573, 99.82t63712, population 597257) and suffered from severe flooding in the second week of September 2021 for 1 week, with flooding levels ranging from 1 to 2 meters.

Table 1 shows the data on the incidence of COVID-19 in this location. The pre-flooding incidence is much higher than the post-flooding incidence which is very interesting. In fact, when flooding occurs, it can block all transportation and may lead to lockdown regulations. On the other hand, flooding may make it difficult to practice social distancing. Based on the current findings, it is possible to conclude that the decreased incidence of COVID-19 indicates that the natural disaster-induced lockdown for external communication effectively reduces the incidence of infection, implying that social distancing from ex-house contact is an important factor in COVID-19 control during the disaster period.

This is only a preliminary report based on observations in a specific setting, and cause and effect may be assumed. The rise in COVID-19 cases could be due to a variety of factors. There are other possible explanations, such as population temporal shifts as a result of flooding. The virus's propagation may be influenced by changes in local temperature throughout the year. Basically, it's impossible to quantify the impact of flooding on illness incidence in a systematic way. Rainfall and illness relationships should therefore be investigated.<sup>3</sup> In terms of the impact of local rainfall, a recent study from Spain found that COVID-19 incidence was inversely linked with temperature and rainfall.<sup>4</sup> Nonetheless, as previously mentioned, the floods have completely halted population migration. The effect of limiting population migration on COVID-19 lowering has been proven. The environment is a tropical zone, and the local temperature does not vary significantly between September and October (average temperature 28 – 30 degrees Celsius). It should also be noted that there had been a lot of rain before the flooding. The higher COVID-19 incidence during the pre-flooding period contrasts with a recent finding that COVID-19 incidence reduced as rainfall increased.<sup>4</sup>

**Table 1.** Incidence of COVID-19

Period flooding	Status	COVID-19 incidence (N)
First week, August	Pre-flooding	61
First week, August	Pre-flooding	60
Third week, August	Pre-flooding	71
Fourth week, August	Pre-flooding	65
First week, September	Pre-flooding	64
Second week, September	Flooding	No data due to no health facility during flooding
Third week, September	Post-flooding	18
Fourth week, September	Post-flooding	24

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**Conflict of interest.** None

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