

## Short Communication

# Are Robust Argue to Predict Vaccines, Temperature, Latitude and Demography Could All Be Reasons Less Infection of Coronavirus in Nepal?

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COVID-19 is a deadly infectious disease similar form of pneumonia/ SARS-CoV-2- impacting globally [1]. Originated in China, the virus spread globally in late February and March [2,3]. The increasing number of new infection and death toll of this virus has been a major threat and challenge for each country and every individual globally. There is still a debate about natural history and the true nature of virus (disease) apparently. WHO declared as a public health emergency for every nation and on 11<sup>th</sup> March, WHO declares COVID-19 outbreaks of a pandemic [4]. COVID -19 affecting most of the countries has reached around 6 million infection and more than 250,000 deaths with recovery of more than 2.5 million people [5]. COVID-19 death toll crosses 100,000 in US alone. However, Nepal has lower experiences of the COVID-19 where only 5 death cases is registered throughout the country [6]. Nepal on January, 23<sup>rd</sup>, confirmed the first case of coronavirus in the country identifying the infected person as a Nepali student who returned from the Chinese city of Wuhan [7,8].

It is claimed the presence of covid-19 in air samples (preliminary data from china, Singapore) to avoid the misleadingness and confusion, and to help scientists and the public with better communication, renaming SARS-CoV-2 as human coronavirus 2019 (HCoV-19). Such a name distinguishes the virus from SARS-CoV and keeps it consistent with the WHO name of the disease it causes, COVID-19 [9]. No doubt, Nepal has lack of health services, lacking of testing kits, advance lab and Protecting Equipment (PPE). However, why COVID-19 does not register in developing counties (Nepal) rather than China, Europe and North America, it is unknown. Do full nationwide lockdown, isolation, social distance, quarantine are the best ways of prevention not to spread rapidly? Most of the COVID-19 cases are still now imported from other countries especially from India due to the porous border [7,4]. One study shows more than 60 percent of the infected people belong to age group 21-40 years [4]. Further one fifth of mortality in Nepal also belong to young age group.

A sufficient hypothesis is floating globally “why has not hit the

country compared Europe and America, by COVID-19”- do BCG vaccinated countries are safer than non-user? [10] OR ecological modeling and mathematical modeling [11] OR due to not having enough kits to screen populations at risk for the virus-while lack of testing a big cause for missing case OR Nepalese have better immune systems? Similarly, the hygiene theory also shows another way to develop resistance to the new virus because the environment is not sterile as in industrialized countries. Other scientists have theorized that countries with a high rate of malaria seem to be relatively less affected, and have even proposed chloroquine as a cure.

Behind the ecological modeling argues that transmission of viruses can be affected by the following factors; like altitude, temperature and humidity of environment, population density, age and gender of people. Those people who are residing at higher altitudes may have higher risks of Covid-19 infection because at high altitude, the partial pressure of oxygen declines leading to respiratory stress. Both high temperatures and high humidity can successfully reduce the transmission of the virus [12]. The arrival of summer and rainy seasons in the northern hemisphere may therefore effectively reduce the outbreak of Covid-19. In contrast, both cold and dry weather conditions weaken the human immune system, making them susceptible to viral attacks. This model further elaborates if people stay in for most of the time weather conditions will hardly influence virus transmission due to no chance of contact between people [11]. Likewise, according to mathematical model, disease can extend itself in cities and regions in a narrow east-west side of the world (about 30-50° N' latitude having temperature between 5-11°C and low humidity levels (specific: 3-6 g/kg and absolute: 4-7 g/m<sup>3</sup>) [13]. Soon after China, the new epicenters of disease were South Korea, Japan, Iran, and Northern Italy (all roughly along 30-50° N' latitude) [14]. Thereafter the disease covered the Northwestern United States, Spain, and France, all along 30-50° N' latitude. However, the virus failed to spread to countries immediately north part of geographical region such as Russia and Mongolia and south of China region [14]. The number of suffered and death patients reported in Southeast Asia is still much less registered record than those in temperate regions. All above mentioning facts shows a strong claim that using on the basis of weather modelling, it is possible to predict countries most likely to be at a higher risk of Covid-19 outbreak in upcoming weeks, allowing for the concentration of public health efforts on surveillance and containment.

The low coronavirus infection and death rates is interestingly low in South Asian which are one of the most densely populated and economically poor countries. These regions host nearly 23 per cent of world population, with a density of 303 per square kilometer. Additionally, in contrast India 453 people per sq km, Bangladesh has 3 times more, the USA has 36 people per sq km. Also, the European

countries Spain and Italy have, respectively 96 and 206 people per sq km [15].

Further, health related infrastructure of this region was also very poor. Each of South Asia's countries has one of the lowest numbers of physicians per capita. It ranges from 0.3 physicians per 1,000 people (Afghanistan) to just one physician per 1,000 people (Maldives, Pakistan, and Sri Lanka) [16]. At the best of times, there are too few healthcare workers with negligible resources. Due to such reasons, this region will still be much more vulnerable if the severe cases of COVID-19 increase [3].

Nepalese health services need to maintain up than today and follow lockdown, isolation, social distance and an advance screening test kit around the country. In spite of limited preparation, it is good to see Nepal a poor country has low number of COVID-19 cases and very low death compared to western countries. Young population may be one reason for low mortality in Nepal [3]. This is not a matter of to be satisfied, Nepal need to be in high alert as many Nepalese labor working either in India or aboard are returning back. As they come back some of may come with COVID-19 disease as well.

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