



Science Behind Non-spreading of COVID-19 During and After Political Rallies

Bhoj Raj Singh^{1*}, Ravichandran Karthikeyan² and Richa Gandharva³

¹Principal Scientist and Head of Division, Division of Epidemiology, ICAR-Indian Veterinary Research Institute, Izatnagar, India

²Ph.D. Scholar, Division of Epidemiology, ICAR-Indian Veterinary Research Institute, Izatnagar, India

³Graduate Scholar in International Public Policy, Department of Political Sciences, University College London, UK

***Corresponding Author:** Bhoj Raj Singh, Principal Scientist and Head of Division, Division of Epidemiology, ICAR-Indian Veterinary Research Institute, Izatnagar, India.

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Abstract

This study briefly describes the history of pandemics and science of their spread and to some extent their control. The analysis of COVID-19, an ongoing pandemic, and cases in different states of India has been undertaken with reference to political rallies organized in Assembly election bound states. The study revealed that holding massive political rallies has either an insignificant effect on speed of spread of COVID-19 (in West Bengal, Assam, Puducherry and Tamilnadu) or may decrease the spread of COVID-19 infections (as in Kerala and Bihar). Political rallies seem to act like a mass vaccination probably through natural Coronation. The use of masks in rallies was not mandatory and majority of people in rallies have not used masks including leaders and the public. No or low attack rate of Corona after unmasked rallies means masking is not a good tool or is an accessory item in process of protection from COVID-19. Authors are of view that COVID-19 should be allowed to run a natural course as is done in election-bound states of India and the disease may vein out as it has shown the trend in Bihar for almost 5-6 months after the election and to some extent in Kerala state. Though the second wave of the COVID-19 in India has engulfed the whole of India the progression of disease in election-bound states remained much lower than the national average.

Keywords: Electoral Rallies; Political Rallies; Pandemic; Communication of Pandemic; Coronization

Introduction

Human race, a socio-political race of intelligent animals, has lengthly dark years of evolution to be the modern age humans. Epidemics and pandemics of diseases played a phenomenal role in shaping our social, cultural, religious and political life since time immemorial. The emergence and spread of diseases have often been linked with evolution in the footsteps of every big political, now economo-political, victory/defeat. Diseases have changed the

culture, history, sociology, economics and even the God(s). Alexander the Great died after winning over the world. He succumbed to Malaria in June 323 B.C. at age of 32, if there would have not been Malaria then, the world history would have been very different. Diseases have taught one and the same lesson time and again, "You might be powerful, may achieve the status of God in your life time but are nothing in front of a tiny invisible seed of the disease". Seed the end of a life and start of another.

Pandemics of significance

Pandemic is a world-wide epidemic of an infectious disease. There are not many pandemics on record but their impact is indelible on human history and lifestyle. The oldest recorded one is Justinian plague (541-549) that wiped out about 100 million faces from the earth in its eight year long course. The second was also the plague (Black Death) with almost 200 million deaths in its seven year run (1346-1353). The third plague pandemic killed 5-15 million people in just three years (1545-1548). The plague, a bacterial disease slowly veined with developmental process and industrialization but never vanished. However, the industrialization or modernization came up with the first Cholera pandemic (1817-1824). That spread in Eurasia and caused death of about 100 thousand people. The second Cholera pandemic followed the footsteps of the first and spread up to North America (1826-1837) but lasted longer with death tolls of more than 100 thousand. The third Cholera pandemic engulfed almost a million people in fourteen years (1846-1860). The 4th Cholera pandemic (1863-1875) took lives of more than 600 thousand humans. The 5th Cholera pandemic killing 0.3 million people haunted the earth during 1881-1896. The 6th Cholera pandemic (1899-1923) killed about 800 thousand people in Eurasia and Africa. The 7th Cholera pandemic caused by El Tor strain of *Vibrio cholerae* started in 1961 and ran up to 1975 and is still going on. It has already killed several million people mostly kids. Cholera never left the earth and still going strong even in 21st Century, the Yemen outbreak (2016-2021) still going on has charged humanity for thousands of lives. In the mean time came the era of flu, the first pandemic of flu in 1889-1890 was caused by Human Corona virus OC-43. It engulfed about a million people and then came the Spanish flu (1918-1920) taking life of about a 100 million people worldwide. The 3rd flu pandemic (1957-58) was a smaller one killing about one to four million also named as Hong Kong flu. In between, we also saw the HIV/AIDS pandemic starting in 1981. It is still going strong and has already taken lives of about 35 million plus productive age people. Now Novel Corona viruses, again entered the centre stage in 21st Century with their mighty shows like Severe Acute Respiratory Syndrome (SARS) in 2002-2004 killing less than a thousand and then Middle East Respiratory Syndrome (MERS) with similar death toll in 2012. With the entry of super hero SARS COV-2 or n-Cov, Coronas proved that they are the real heroes of today [1]. Learning from weaknesses and strength of human race, SARS COV-2 started its play in late 2019 and still it does not seem to be an interval time in the show. It has already killed just less than three million. Many of the pandemics and epi-

demics in the history followed the footstep of political instability like war or victory. However, Coronas entered the stage when human race started thinking to conquer the universe and demolished many of the fast growing economies of the world.

Prehistoric lethal outbreaks

Prehistoric epidemics and pandemics of diseases are described in almost all religious scriptures and reviewed beautifully by Huremovic [1] and need not to rewrite again. However, to reveal the impact of the epidemic on the human race Mousal Parva of Bhagwata Puran is worth mentioning. It reveals the story of the devastating end of a whole dynasty (Godly and mighty) and its capital city Dwarika dated about 9000 BC. All relatives and descendants of Lord Krishna died in internal maniac infighting due to the curse of a Rishi (Durwasa) who was insulted by the mighty Yadavas after 36 years of Mahabharata. The curse led to the death of 560 million Yadavas. Nobody knows either it was a disease that led to precipitation of erratic maniac fighting with own people, maybe some virus inflicting the brain and must be contagious enough to spread rapidly among 560 million people to die within a short span of a month. No one was left to suffer and die after the outbreak. Though Lord Krishna emerged mighty and victorious in Mahabharat, his mighty dynasty could not stand a curse (probably a disease). Pandemics have not only demolished Gods but also created some more Gods. In Indian culture, anything beyond your control is considered an incarnation of one or another God. The Smallpox, depicted as an expression of the unhappiness of Sheetla Mata or Sheetla Devi (thought to be an incarnation of Goddess Durga) has haunted the world over the long history of civilization as a hyper-endemic disease (rarely written as a pandemic). It used to visit almost every seven years and killing almost 30% of the susceptible kids (a powerful tool of population control) is still worshipped in Indian villages. The Goddess Sheetla is worshipped on the 8th day of the Chaitra (March-April) and Shravana (July-August) months, the two periods when most of the viral infections spread in India. Sheetala Devi Pooja is a rigorous community ritual as any mistake in performing it may incite the rage of the Goddess in form of smallpox, measles and many other deadly diseases. The Sheetala Devi Pooja requires utmost cleanliness and purity and propagates a sense of hygienic living among devotees. Similar is the case of the 41-day 'Vrutham' period observed by devotees of Lord Ayyappa in Sothern India. As a general rule, it is not easy to make someone follow orders either for health or hygiene or for some other purpose but we all fear God and if God orders we follow blindly if have faith. That is why God/

Goddess might have been created with the thought that fear of God will make human do that which is required and needful. The fear of God is the driving force behind most of the beliefs and actions of Indians and God-fearing communities all over the world [2].

Endemic diseases killing millions of people every year all over the globe but not given the status of Pandemic

Every year, tuberculosis (TB) kills more than a million people (1.4 million in 2019) and is one of the top 10 causes of death and the leading cause from a single infectious agent followed by HIV. In 2019, almost 10 million people fell ill with tuberculosis and it is present in all countries and age groups but not a pandemic but a pan-endemic. Though as per WHO [3] TB is curable and preventable, we still are far away from the target of getting freedom from TB. The causal agent of TB was reported identified on March 24, 1882, by Robert Koch as a bacteria (*Mycobacterium*) which originated more than 150 million years ago. The *M. tuberculosis* (MT), the cause of TB, started infecting early hominids in East Africa about three million years ago. The common ancestor of the modern strains of MT might have appeared 15000 to 20000 years ago. The disease has been evidenced in 2400 BC old Egyptian mummies. Despite failures against TB human race progressed with TB [4].

The other globally prevalent disease is Malaria killing more than a million humans every year (1-3 million). Among the dying population, most are young adults and kids below five years of age. Most of those (80-90%) suffering from Malaria are poor, living in rural sub-Saharan Africa [5]. It is preventable and treatable but a disease of poverty, that is why grossly ignored. The two diseases (TB and Malaria), though global in distribution accounts for the death of more than three million people every year (for COVID-19, deaths are not yet reached three million even after one and a half year of its appearance) no lockdown, no emergency, no efforts to save the people and no serious alarms are run by WHO or any other health agencies or any of states. Why? It is because pharmaceutical politics doesn't allow it, because sufferers are poor and mostly in poverty-ridden countries, they cannot afford costly diagnostics, vaccines and sanitary measures. The COVID-19, on the other hand, targeted more urban non-poor people and everyone is worried to save a few million mighty people even at the cost of the whole world.

There are many more globally dangerous but grossly ignored diseases like in 2019 Dengue affected about 4.2 million with 1-20% case fatality rate (CFR), Chikungunya infected 2.5 million (0.1%

CFR) people and lymphatic filariasis was estimated to affect 51 million humans, but who cares the poor. Diseases of the poor have lost their grace in the Pharma industry and the interest of money mongering scientists.

What do scientists say about the spread of infectious diseases?

In the case of all contagious diseases, public gatherings definitely increase transmission/spread of disease often leading to vitiation of the ongoing epidemic/pandemic. To control and contain any contagious disease epidemic social distancing through isolation, quarantine, reducing the movement to the minimum touted as the foremost preventive strategy. The disease which spread through droplets/air often has a high basic reproduction ratio ($R_0 > 1$) as is the COVID-19 ($R_0 = 2.24$ to 3.58) [6].

Gatherings either political or religious or communal are certain to increase the risk of the spread of a contagious disease provided the disease is there in the community [7]. Communal gatherings among Muslims to offer Namaz especially every Friday have been prescribed by several Muslim sects and organizations. It is on record that Iran was one of the worst-hit countries in 2020 with the COVID-19 pandemic due to the practice. The Head of the main shrine in Qom appealed to the pilgrims to keep coming to the shrine and called it a place of healing but it led to the unabated spread of the disease [8]. Similarly, three Tablighi Jamaat meetings in Malaysia, Pakistan, and India became COVID-19 hotspots. Though South Korea successfully contained the disease, a Christian (Shincheonji Church of Jesus) congregation led to a resurgence of a large number of COVID-19 cases [9]. Similarly, Israel witnessed a very high rate of COVID-19 infections among the ultra-orthodox Jews than in other Israelis. It was because of big families and crowded living, unflinching observations of communal religious prayers performed by the community along with religious gatherings during the Jewish holiday of Purim [10].

The disease data of the US revealed a spurt of about 30,000 COVID-19 cases after political rallies by then-president Trump in October 2020 in the US [11,12] and nobody knows why Biden's rallies have not invoked any spurt in COVID-19 cases or ignored to be reported. It is often said that the non-use of a mask by trump followers angered the COVID-19.

Electoral rallies in India

However, it is still a dilemma, why political and non-political large congregations attended by millions of people in India not

speeded the spread of COVID-19 in the states involved to the level of the most affected states where nothing such phenomenon took place? In late 2020, in Bihar, more than 500 big political rallies were organized within a month but not led to precipitation of COVID-19 outbreaks (Figure 1). Rather, data revealed that the number of cases gone down a bit after rallies. The trend-line slope analysis and regression analysis (Table 1) revealed that in Bihar, instead of an increase in cases of COVID-19 a significant decrease was observed even after more than five months of the declaration of election and hundreds of political rallies with a massive crowd. The negative impact of rallies on COVID-19 spread can still be seen in Bihar COVID-19 data when compared with other non-election

states of India (Table 1). It seems that in Bihar political rallies in October –November 2020 might have acted as immunization of the masses or acted better than the immunization. On the other hand, data of COVID-19 cases in India after commencement of COVID-19 immunization revealed that an upsurge in the number of immunized persons corroborates closely with the increase in the number of COVID-19 cases consistently (Figure 2). The data of COVID-19 cases in Bihar after political rallies (Figure 1) and now after vaccination of the Indian public with Covaxin or CoviShield vaccines (Figure 2) indicated that rallies act as a better protector against COVID-19 than any of the two COVID-19 vaccines.

States	Slope	Intercept	R ²	Regression	Significance
Delhi	86.60314	-679.91	0.6973	0.835062	1.14E-11
Gujarat	72.20401	-132.601	0.9328	0.965801	1.8E-24
Maharashtra	1180.881	-597.655	0.9062	0.951949	1.21E-21
Punjab	70.14547	410.7988	0.9058	0.951761	1.3E-21
Assam (EB)	1.355575	5.142683	0.6699	0.81846	6.31E-11
Kerala (EB)	-13.5929	2628.938	0.0654	0.255709	0.106602
Pudducherry (EB)	5.250871	-34.1707	0.7684	0.876568	5.9E-14
Tamilnadu (EB)	80.11707	-280.141	0.85	0.921953	1.18E-17
West Bengal (EB)	37.0878	-209.746	0.6431	0.80194	2.94E-10
Bihar	17.37735	-168.949	0.5564	0.74589	2.19E-08
India	2203.536	-3510.34	0.865	0.930058	1.49E-18
Bihar day 1 to Day 172 of declaration of election (25 th September) to 15 th March 2021	-7.86178	1196.236	0.7882	0.918713	1.7E-70

Table 1: Linear regression and trend line characteristics of the confirmed COVID-19 cases reported in different election-bound (EB) and non-election-bound states of India after declaration of the general assembly elections on 26th February till 6th April 2021.

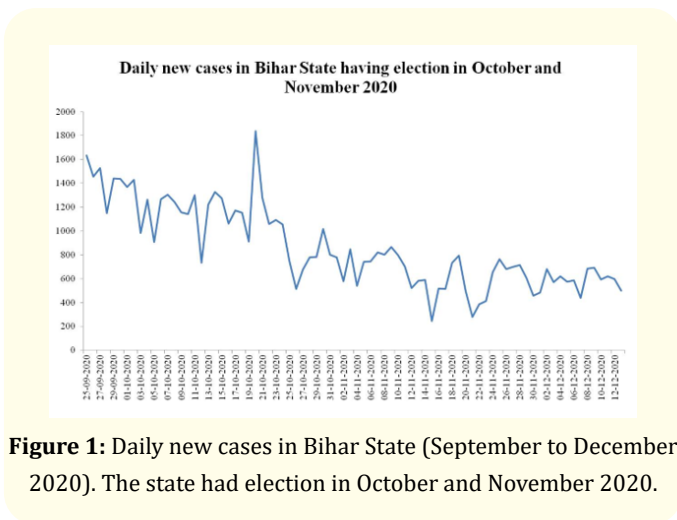


Figure 1: Daily new cases in Bihar State (September to December 2020). The state had election in October and November 2020.

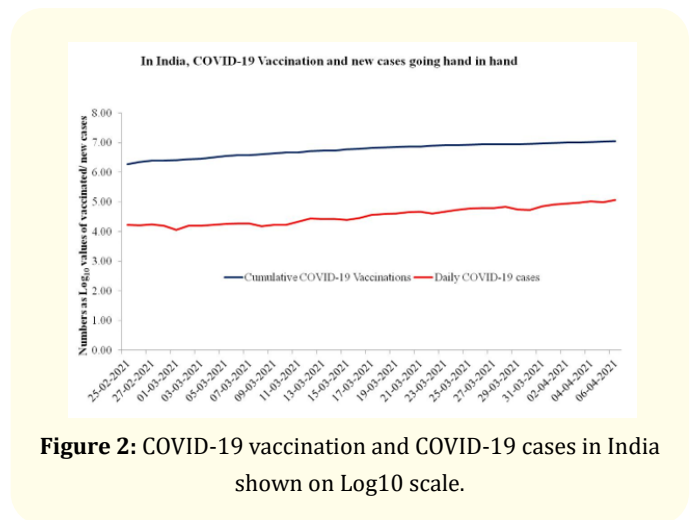


Figure 2: COVID-19 vaccination and COVID-19 cases in India shown on Log10 scale.

The political rallies in the other five states, where assembly elections are just culminating this month, also blunted the pace of the increasing number of COVID-19 cases on the commencement of 2nd COVID-19 wave in India. The slight increase (about a log increase over two months) noticed in a few election-bound states having hundreds of large political rallies attracting a gathering of millions of people was not significantly different than the trend of COVID-19 cases at the national level (Figure 3). Surprisingly, the pace of increasing COVID-19 cases in election-bound states despite thousands of political rallies was not as good as in other non-election bound states like Maharashtra (Figure 3). Further analysis of trend-lines and regression characteristics (Table 1) indicated that in Kerala election rallies effectively cut down the cases of COVID-19 and in other election-bound states also increase in the disease cases was much less significant than that observed in other non-election bound states.

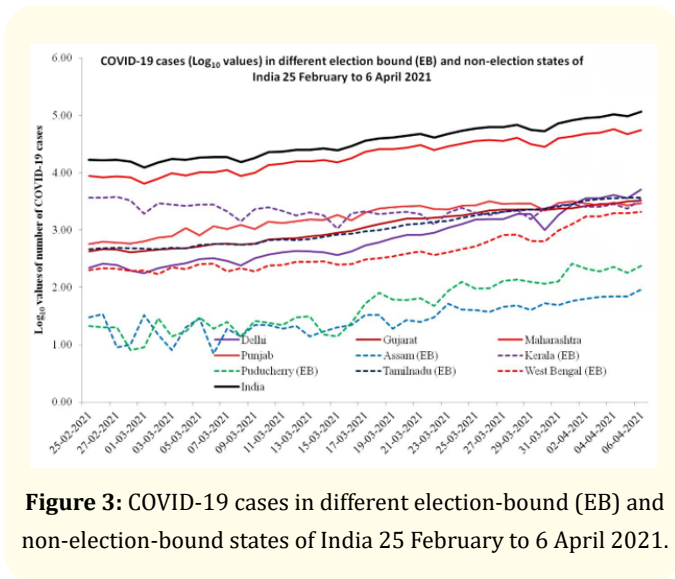


Figure 3: COVID-19 cases in different election-bound (EB) and non-election-bound states of India 25 February to 6 April 2021.

Further analysis of regression slopes (Figure 4) indicated that in the 2nd COVID-19 wave in India of the 19 most-affected states three (Kerala, Tamilnadu, and West Bengal) are those where massive political rallies were held and one (Uttarakhand) is where world’s biggest religious congregation (Kumbh Mela) bringing several millions of devotees together for about a month. Though crowd gathering states (election-bound and Mela-bound) are also in the top 19 most affected states of India, they are much behind the states where all restrictions were put and no such crowd gathering took place in past. However, village Panchayat elections are going on in Uttar Pradesh but are neither associated neither with massive

rallies nor with the increases in COVID-19 cases in village of the states. However, due to non-testing of COVID in rural Uttar Pradesh may also be the reason for no report of an increase in cases. In Uttar Pradesh, the most affected areas are urban areas where neither elections nor Melas is held.

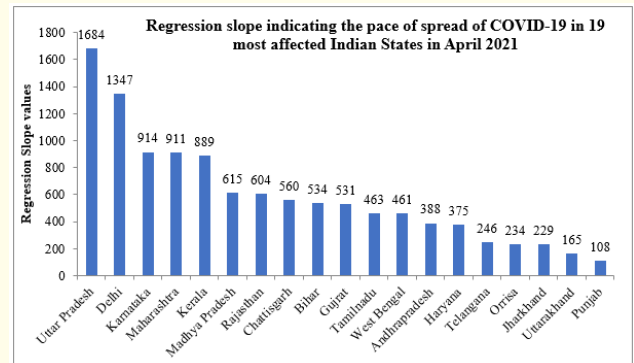


Figure 4: Spreading rates in terms of regression slope for the COVID-19 cases in 19 most affected states of India. Election-bound states include Kerala, Tamilnadu and West Bengal, Kumbh Mela state Uttarakhand are also in the list but much behind than states of Delhi and Uttar Pradesh.

The data have strongly indicated that organizing big political rallies either have a significant role in controlling (in all election-bound states) the spread of COVID-19 or insignificant effect on speeding the propagation of COVID-19. As a post election (political rallying) effect a reduction in COVID-19 cases (in Bihar) was evident. Therefore, political rallies and large religious congregations can be organized in open spaces in the Indian context without any appreciable fear of the spread of COVID-19.

How does COVID-19 spread?

As per WHO (2020) guidelines, SARS COV-2 transmission occurs in high frequency when “Three C’s” overlap. The three C’s are: Crowded places; Close-contact where people have conversations very near to each other; and Confined and enclosed spaces with poor ventilation. The 4th C missed by WHO is the “Contagious person disseminating the contagion”. First C, the crowd is always there in rallies, the second C, Close contact and Conversation is also there but limited in rallies, 3rd C, the Confinement in closed space is almost totally missing in political rallies in India. The 4th C, Contagion/seeds of infection may certainly be there in rallies too as they

are there in all the states in India. In all the states of India COVID-19 cases are reported daily including all election bound state or rally-bound states that is contagious people are there. However, either those contagious persons are attending or not able to attend rallies (if sick certainly not, but if asymptomatic carriers may be there) may be big question to ponder? However, it is highly probable that in such a big crowd of political rallies at least a few asymptomatic carriers of COVID-19 virus are there.

Spread of infection is dose-dependent

One who studies infectious diseases knows that size of inoculum or the infecting numbers of the pathogen play a pivotal role in determining the outcome either as disease, or no disease and numerous stages of disease between apparently healthy to dead. Though nobody exactly knows the infective dose of SARS COV-2, the cause of COVID-19, scientists have proposed it to be bit lower than that of pandemic flu H1N1 (~700 virus particles), it might be a hundred or few hundred particles [13]. Though the outcome of infection is dose dependent but the other two determinants, the host and environment, can modulate the outcome efficiently. The infecting dose decides the severity of the infection and severity determines the disease spreading or disease transmitting potential of a patient.

The persons attending political rallies are not apparently sick, may be either mildly sick or just unapparent or asymptomatic or pre-symptomatic carriers of the disease bearing a low potential of high dose distribution. The low dose distribution of infection may lead to occurrence of disease in a few immunologically weak subjects but most of the recipient may have dose not sufficient to cause the severe disease which require hospitalization or reporting. The rallies (either political or apolitical) might certainly be exposing masses to the infection but in low dose which might be as good as immunization. This may be one of the scientific reasons behind the occurrence of no serious outburst of COVID-19 cases even after so many rallies in India. The figure depicting number of COVID-19 cases before, during and after electoral rallies in Bihar (assembly elections held in October-November 2020) indicated the positive impact of rallies on warding off the COVID-19 epidemic.

Period of contact and its effect on acquisition of infection

Most of the infectious diseases spreading through direct or indirect contact require a certain length of contact (conjugal period) with the infectious person or the objects to acquire a required infective dose. If the conjugal period is less, the less dose of infection is transmitted and less chances of getting sick and more of getting immune due to suboptimal infection. From the experience with

COVID-19 and other similar diseases, we know that huddling in a closed environment leading to increased heat and humidity favours the spread of infection. In India most of the rallies are organized in open and the crowd is also loosely organized and lot of movement can be seen. Indian political rallies seen from distance looks like a field full of microbes under microscopic lens where we observe that even the non-motile microbes have some motility (Brownian movement) under the effect of the microenvironment. The rally crowd is less likely to have long-lasting contact period with any asymptomatic or pre-symptomatic infectious individual [14] in rally. Therefore, only remote chances of spreading of COVID-19 exist through political rallies.

Poverty

Now the important reason comes to the light, COVID-19 is affecting more to urban comparatively rich people [15]. Rich and mighty are rarely going to attend political rallies in open and hardship and the poor people going to rallying are pardoned by COVID-19 due to its inherent nature of affecting mostly the rich and their companions. Thus there is no so high rise in cases of COVID-19 even after so many rallies in election-bound states of India. However, when comparatively rich people attend the rallies, as in case of Donald Trump rallies in US, COVID-19 failed to excuse rallying crowd [12]. Thus COVID-19 can be seen as global equity induction force of nature than a real disease. The association of COVID-19 with richness is now not only well established but can be seen from the global and national demographic distribution of the disease. In India, economic capital of India (Mumbai) is worst hit and another equally big city, Kolkata, is almost unaffected by COVID-19 (Figure 5). The poverty alleviation activities like industrialization and other economic activities favoured the spread of COVID-19 not only in India but globally [15]. The message is simple, poor mean less COVID-19.

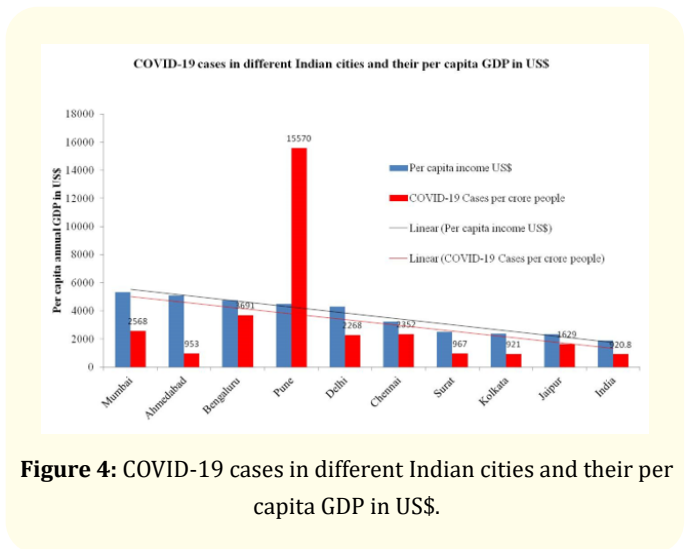


Figure 4: COVID-19 cases in different Indian cities and their per capita GDP in US\$.

Conclusion

Though most of the contagious diseases spread through contact without differentiating the background of contacts, COVID-19 seems to be much more intelligent as it can differentiate between different types of contacts. COVID-19 differentiated between contact among poor and non-poor people, rallying and non-rallying (working) people, political versus apolitical people etc. The data of different states of India undergoing elections phase and holding massive rallies indicated that either political rallies have insignificant effect on spread of COVID-19 (in West Bengal, Assam, Puducherry and Tamilnadu) or may even decrease the spread of the COVID-19 infections (Bihar). Rallies and religious congregations held in open space to some extent seem to act like a mass vaccination program probably through natural Coronation (spread of sub-lethal dosages of SARS COV-2). The use of mask in rallies was not mandatory and majority of people have not used including both, leaders and the public, still no excess attack of Corona, means masking is not a good tool or an accessory item to get protection from COVID-19 infection. Authors are of view that the COVID-19 should be allowed to run a natural course as is done in election-bound states of India and the disease may vein out as it is showing the trend in Bihar states of India.

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