

# Combating COVID-19 in Bangladesh: ideal duration of mandatory quarantine period and policy implications

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**ABSTRACT:** Amid this Covid-19 pandemic, it is crucial to have the best possible estimation for essential quarantine days to mitigate the risk of Coronavirus spread. In this article, we aim to better approximate the mandatory quarantine days based on the available published literature. Our review of scientific publications revealed that 14 days of quarantine is not enough neither effective in restricting the Coronavirus. Instead of 14 days, one study suggested to imply 21 days of quarantine to completely assure the symptom appearance in infected people. In case of community transmission, as it might take up to 19.9 days to death from the first appearance of symptom in a community, an effective quarantine period to contain the spread of Coronavirus should be a minimum of 40 days. For a densely populated country like Bangladesh, planning effective strategies using available data is crucial to prevent the upcoming second wave of this pandemic.

**KEYWORDS:** COVID-19, Quarantine period, Bangladesh, lock down period, Policy

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Infection by the novel Coronavirus, Covid-19 was isolated and identified on January 7th 2020<sup>1</sup> from a cluster of people suffering from unusual pneumonia in Wuhan province of China, and 4 days later, China reported their first death due to Coronavirus.<sup>1</sup> As it was new, before placing essential restriction to avoid the spread, the disease managed to cross borders and was soon declared a global public health emergency.<sup>2</sup> In the next 3 months, the virus spread to over 215 countries and territories infecting 22914402 people among whom 797999 had died as of 21 August 2020.<sup>3</sup> With only a few exceptions, the virus is crushing the economy and overwhelming the healthcare system of wherever has been spreading for more than a few weeks.

The average number of secondary cases infected from one primary case is represented as the reproduction number ( $R$ ). The main aim of restrictive measures for slowing down the spread of infections by Covid-19 is to decrease this  $R$  and keep it below 1.<sup>4</sup> Following data from Wuhan, a baseline assumption of  $R_0 = 2.4$  has been established depending on the growth-rate of the Coronavirus spread in early stages.<sup>4</sup> The most challenging factors complicating the control of this virus are the high contagiousness (with  $R_0$  estimated at about 2.4) and persistence in the environment, as this can be in the air for half an hour,<sup>5</sup> and remain viable on some surfaces for up to 3 days.<sup>6</sup> Globally, the first one hundred thousand people was infected by the first 67 days, the second one hundred thousand were infected within 11 days, the third were infected within 4 days.<sup>3</sup>

Most places after China, affected by a Covid-19 outbreak early on were higher-income countries such as Italy, France, Spain, UK, USA and Australia.<sup>7</sup> The health system, communication system and technological advancement in these countries are higher than many lower- and middle-income countries.

However, the way in which South Korea, China, Japan and Hong Kong had given importance to the testing of patients as well as keeping them in isolation or quarantine<sup>8</sup> was not properly followed by Italy or USA in the beginning, causing the critical situation they are now facing. During the last 3 weeks of April 2020, around 500 people died each day in Italy and Spain.<sup>3</sup> In USA, over 30 000 people have newly been getting infected each day as of 22nd April, and around 2000 people died each day.<sup>3</sup>

Our understanding about this virus rapidly changes which actually make it difficult to make concrete public health recommendations. We are receiving new information regarding how long it survives on clothes or on the surface of tables. For instance; according to 1 newspaper report,<sup>9</sup> on 23rd March, 2020 even 17 days after a patient had left a cruise ship, SARS-CoV-2 RNA was still found in its cabin, which is the genetic material of the virus that causes COVID-19. An accurate understanding of these epidemiological characteristics is vital to understanding how the virus spreads. According to 1 study, the droplets bearing the pathogen can travel up to 27 feet, contaminating all surfaces on which they settle.<sup>10</sup> Another study showed that the virus remained suspended in the air as an aerosol for 3 hours under laboratory settings but only for around half an hour in most other settings.<sup>6</sup> If the virus remains suspended in air via droplets for a minimum of 30 minutes, then it would be sensible to require everyone to wear masks as a safety precaution.<sup>5</sup> The risk of infection could be reduced by allowing ventilation of the air so that airborne contaminant could be diluted instead of allowing the contaminated air to re-circulate, infecting people from many other parts of a building and contributing further to the outbreak.<sup>11</sup> Hence it is important to be careful to emphasize



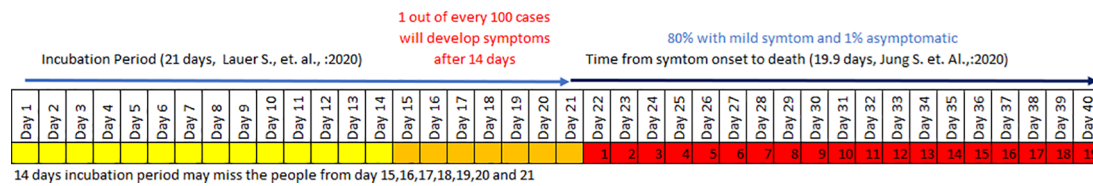


Figure 1. Time period from Incubation to death.

other aspects of Coronavirus prevention; limiting preventive messaging to only hand washing is not enough to restrict the spread of the Coronavirus.<sup>12</sup>

However, before understanding any of these epidemiological dynamics, China had enforced a very stringent policy, which has been called draconian by many in the international news media. In Wuhan, the capital of the Hubei province in China, the movement of people outside of their homes was prohibited from 23rd January, 2020.<sup>13</sup> Some restrictions have already been lifted, and restrictions are planned to return to normal from the 8th of April.<sup>14</sup> As a result, in Wuhan, the epicentre of the outbreak, housing a population of over 10 million,<sup>14</sup> there was only 1 person who tested positive for COVID-19 on 24th March.<sup>3</sup> On the other hand, thousands of people are being infected daily in Europe and USA, where initial responses were largely for voluntary social distancing. But, there is little 'flattening the curve' occurring in these locations. Hence, it can be said that China's rigorous draconian method of not letting people go outside significantly reduced the spread of COVID-19.<sup>15</sup>

It may be difficult for other countries to confine people indoors for two and a half months, like China did, but what would be the minimum number of days for which it would be effective? The results of various studies indicate that the incubation period of the Coronavirus is usually from 2 to 14 days.<sup>16</sup> Stephen A. Lauer and other researchers (2020) have studied the reports of 181 corona infected patients and concluded that 1 in every 100 people may take more than 14 days for the symptoms to appear.<sup>17</sup> As 'Patient-31' in South Korea was solely responsible for the infection of 9000 people on 25th March,<sup>18</sup> it is vital to calculate the maximum number of days for quarantine for this highly infectious disease rather than the mean incubation period. Therefore, 14 days of quarantine is not enough to restrict the Coronavirus, and this is not an effective method according to our understanding.

We can conclude from Lauer et al, that, if a suspected patient is kept in quarantine for up to 21 days, then those infected could potentially be prevented from going outside and infecting others. Hence, it is crucial to increase the number of days of quarantine from 14 days to 21 days. However, if COVID-19 has already spread within a community, then it is not effective to quarantine just the suspected cases, which is evident from observing Italy and USA.<sup>7</sup>

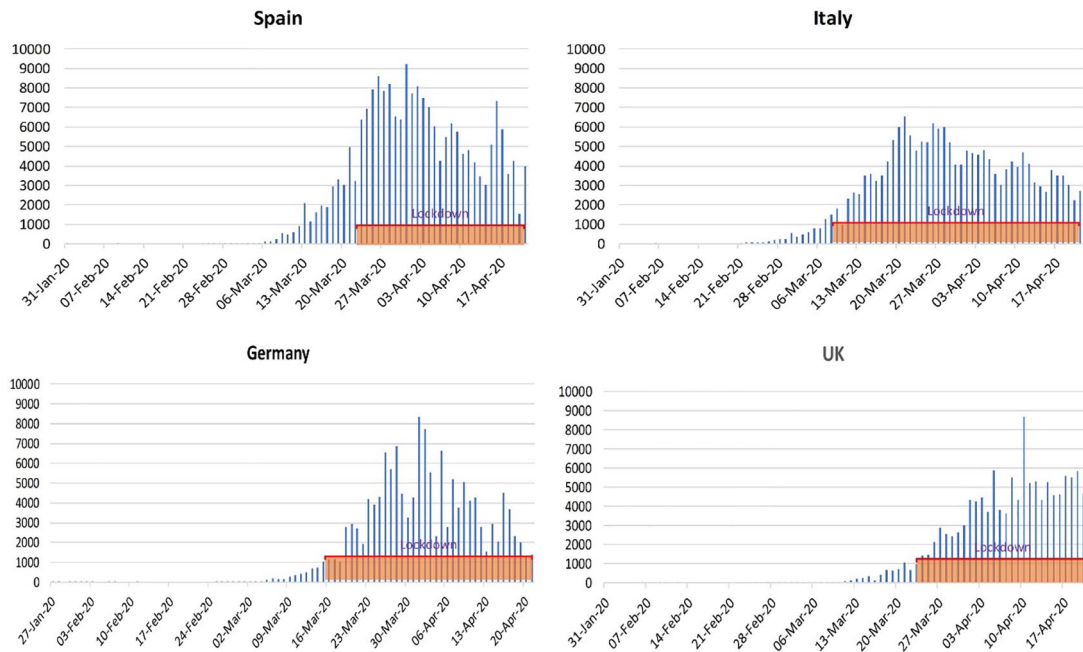
Recent articles from Jung et al.<sup>19</sup>, demonstrate that after the symptoms first appear, it may take up to 19.9 days from the time of first symptoms to death. But it must be noted that in about 80% of the patients, COVID-19 could cause very ordinary symptoms such as runny nose or cough, and the infected person may not even know that she/he is infected. However, when these 80% work or roam outside, they infect others without being aware. Therefore, if any country wants to control the spread of Coronavirus effectively, then that country must strictly lockdown for a minimum of  $(21 + 19) = 40$  days (Figure 1). Afterwards, if the lockdown duration increases, Coronavirus infection control would be more and more effective. An effective lockdown of more than 3 weeks could help to reduce the number of new cases per day (Figure 2), but controlling the spread requires more time.

However, countries from South Asia such as Bangladesh, India, Pakistan, Myanmar, Nepal and Sri Lanka which are densely populated, may require less time for the number of Covid-19 cases to double.<sup>20</sup> Furthermore, since COVID-19 transmission has already begun in the community in Bangladesh<sup>21</sup> these numbers could explode if prompt action is not taken. The danger for Bangladesh is that, there are over 8 million people here who are aged 65 years or more. Apart from this, for children to 64 years old, Coronavirus could take a dangerous turn for those who suffer from various other diseases such as asthma, hypertension or diabetes.

## Recommendations

For the context of Bangladesh, 'quarantine' or 'isolation' is next to an impossible option given the low-wage daily earners or the slum-dwellers who solely constitute of around 40% of the population in the capital city. Stepping outside of their homes is a must for these groups of people, in order to be able to afford their daily bread. Sharing a single tin shed room with 4 to 5 other people as well as a bathroom or a single water source in the slum areas is a haven for the virus.

Hence, policy decisions considering these settings are vital at a very early stage of the spread. Investments for scaling up testing capacity at the community level and providing infection control supplies to these people may prevent an eruption of cases in these crowded habitats. Additionally, the existing level of collective action among the influential people of these areas could be explored to deliver COVID-19 prevention-related messages (handwashing, social distancing, coughing/sneezing



**Figure 2.** Number of new COVID-19 cases per day from the first detection and effect of lockdown.

into elbow, wearing masks etc) since uptake may be higher through them than through social media.<sup>22</sup>

Moreover, given regular circumstances, garments workers in Bangladesh who manufacture products for the fashion and tech industries face immense social, economic and health obstacles. In the present day their suffering has doubled due to the coronavirus outbreak because multinational companies have shut down these ties. This could lead to dire economic impacts on Bangladesh since the garment's sector accounts for 80% of the country's total export earnings with annual revenue of \$34 billion dollars.

Policies for investments in mobile clinics could be explored, in order to provide primary health care for the low-income residents, that does not put a burden on their limited (and potentially wiped out) income.<sup>22</sup> A group of researchers identified common non-pharmaceutical interventions (NPIs) during the 1918 to 1919 Spanish Flu pandemic where mass gatherings were banned and schools and universities were closed for 4 weeks on average. They also assessed the economic outcomes, showing that quicker policy impositions led to a 4% higher employment rate after the pandemic, whereas 6% for those that continued interventions for longer durations.<sup>23</sup> Therefore, if such policies are adopted in Bangladesh, by covering the basic salary for the low-wage earners for a period of 4 weeks to 40 days, could potentially prevent a future outburst later into the year in this densely populated country.

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### Author Contributions

AA drafted the manuscript together with RJA and JT. RJA and JT review the subsequent drafts and provided inputs.

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