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Impact of COVID-19 public health measures on other respiratory illnesses

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Abstract

Since the declaration of COVID-19 pandemic by WHO on 13 March 2020, over 210 countries / territories have had active cases and 1/3rd of the world's population have been on complete lockdown or partial restriction. Main route of transmission of COVID-19 is through droplets like most communicable respiratory illnesses followed by infected surfaces. Public measures like wearing masks, social distancing, hand washing and other respiratory hygiene are being followed in unprecedented level and people are tested rapidly if they show symptoms of the disease such as fever, cough, fatigue, myalgia and dyspnea. These symptoms are similar to other respiratory diseases such as common flu, influenza, pneumonia and Tuberculosis. The preventive measures are also effective in these diseases. In Wuhan, China the lockdown lasted for 76 days and seems to follow similar course in other countries. The air pollution and travel has also decreased which will further decrease transmission of respiratory illnesses. These behavioral changes can get embedded into human cultures and play a vital role to decrease incidence of other respiratory illnesses. To measure the impact, we need to be observant and carry time series analysis of the pre and post pandemic data. With proper strategies this could be utilized as an opportunity to reduce burden of other respiratory communicable disease.

Keyword: COVID-19, respiratory infection, social distancing, tuberculosis, influenza, lockdown

The COVID-19 (corona virus disease 2019) is caused by severe acute respiratory syndrome corona virus 2 (SARS-CoV-2). This virus belongs to the corona virus family which has had outbreaks in the past, namely MERS (Middle East Respiratory Syndrome) and SARS.¹ As of 19 April 2020 there were 2,359,346 people diagnosed with COVID-19, 161,951 deaths and 606,705 had recovered from the illness.²

The most common symptoms at onset of illness in descending order are fever, fatigue, dry cough, anorexia, myalgias, dyspnea and sputum production.¹ These symptoms are similar to that of many febrile illnesses and other causes of respiratory infection which makes it hard to diagnose COVID-19 based entirely upon clinical findings. Patients with history of travel to places with outbreaks and contact with positive case within 14 days are prioritized for testing.³ The mode of transmission of COVID-19 is mostly through droplets (person to person) and by contact from infected surfaces.¹ Other respiratory infection like Influenza and tuberculosis (TB) are mainly transmitted by droplets.⁴ Influenza has shorter incubation (median 3 days) period than COVID-19 (5-6 days), whereas, TB has longer and variable incubation period since latent TB can take months to activate.^{4,5}

One infected person on average reproduces the infection in about 2-2.5 people which is higher than influenza.⁴ However there are incidences like case 31 in South Korea where one individual is responsible to transmit the disease to a large number of people. Individuals with active TB can infect 5-15 people in a year.⁵ There is seasonality of influenza but not that of TB. Seasonal variability of COVID-19 is yet to be fully understood. In Influenza infection children play a vital role in transmission in the community. Children and teenagers are relatively less affected by COVID-19 and are less serious than older age group.⁴ Most of the TB patients are adults, it also affects a large number of children and people who are immune-compromised.⁵

Many drugs are under clinical trial and vaccines in development.⁴ This means that the fight against COVID-19 is mostly preventive for the uninfected and supportive for those who have the disease. After WHO declaration of pandemic on 13 March 2020, by 19 April 2020, more than 210 countries and/or territories have had active cases of COVID-19, affecting a third of the world's population, requiring lockdown/restriction.⁷ In Wuhan, the epicenter of pandemic, the lockdown lasted for 76 days and other countries are following similar course.⁸

Following recommendations have been issued by WHO to combat the COVID-19 infection and mitigate transmission of virus.^{9,10}

WHO recommendation to the general public⁹

1. Social distancing,
2. Washing hand frequently,
3. Avoid touching mouth and eyes,
4. Practice good respiratory hygiene,
5. Seek medical care early if you have fever, cough and or difficulty breathing.

WHO recommendation for Health care providers¹⁰

1. Ensuring triage, early recognition, and source control (isolating patients with suspected COVID-19)- have high level of suspicion,
2. Applying standard precautions for all patients,
3. Implementing empiric additional precautions (droplet and contact) for suspected cases of COVID-19,
4. Implementing administrative controls,
5. Using environmental and engineering controls.

These measures have shown to be useful in countries like China and South Korea, and the world is following suit. These messages of public awareness have been circulated throughout the world through different multimedia outlets and also through active participation of public and influential people around the globe. The primary target of this is to prevent spread of COVID-19 but these methods are also effective to prevent most of

the droplet infection and disease related to hand hygiene and contaminated surfaces. There is also huge improvement in the air quality around the world with decrease in pollutant due to lockdown, decreased industries, airplane travels and vehicles. Decrease in air pollution also reduces non communicable illnesses such as heart disease, stroke, COPD, asthma, and Lung cancer and communicable disease such as pneumonia. Further there is reduction in number of domestic and international flights, which will decrease cross border transmission of disease. The Air Quality Index (AQI) needs close observation as the world starts to resumes its activities.

Way forward- Hypothetically, such strategies and practices, like face mask, social distancing, and respiratory hygiene along with the lockdown will not only reduce the transmission of COVID-19 but also decrease the incidence of other respiratory disease and give better fighting opportunities to programs for elimination and eradication of TB, control of Influenza infection and Community Acquired Pneumonias. It is very plausible for this knowledge being carried long after the COVID-19 situation is under control as there's a certain amount of phobia and concern regarding self-protection from the illness and people will continue following some of the etiquettes. This can be supported by the fact that wearing mask or covering faces with clothes got embedded into Asian culture especially in Japan after the Spanish flu of 1918 and global flu epidemic in 1934 after which people began wearing mask regularly in winter which is prevalent till this date.¹¹ On the contrary WHO puts forward concern that due to the social stigma of COVID-19 people with undiagnosed pulmonary TB may not be willing to seek medical care because of similar symptoms. This can increase the exposure to family members if precautions are not taken however the risk of exposure to a larger population is markedly reduced. This might not be true, rather have an opposite effect, where symptomatic patients go for checkup early and hence leading to early diagnosis. People who have concomitant TB infection

with COVID- 19 might only be diagnosed for later which will delay diagnosis and increase mortality and morbidity. The framework of contact tracing and testing can be utilized to fight against Influenza and Tuberculosis too in the future.

In conclusion, for measuring the actual effect of COVID-19 public health strategies, we should conduct time series analysis to look at the incidence of the disease like TB and influenza in the coming years and compare it to previous years keeping in mind the usual rate of reduction or increase in these cases, natural variation and advent of other interventions that are put in place to increase diagnosis and reduce cases. According to 2018 National Tuberculosis report there were 32,474 new cases in Nepal and 10% of the cases were from Kathmandu district alone.¹² We can compare incidence and infectivity of disease by cities, regions and see if the burden of disease shifts from one geographic location to other. We can also see if there's change in dynamic of drug resistant TB and strains of Influenza. We can also compare the cross-infection to family members before and after the pandemic. This pandemic has potential to shape the human civilization with apocalyptic threats and will have long term impact in the course of diseases that we suffer from. With proper strategies the current COVID-19 situation could be utilized as an opportunity to reduce burden of other respiratory communicable diseases, like TB, influenza and community acquired pneumonia.

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Conflict of Interest

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Author Contribution

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MM and ST carried out further literature review and developed the final draft. All authors read and approved final manuscript.

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