COMMENTARY

Personal prophylaxis against COVID-19: A compilation of evidence-based recommendations

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Abstract

The year 2020 started with a report about a cluster of pneumonia cases from Wuhan, China, that were later identified to be caused by the novel coronavirus. By March 11, this outbreak was designated as a pandemic by World Health Organization. So far, it has affected 213 countries and territories around the world. It is an infectious disease (R0: 2.2 to 3.3) with confirmed human-to-human transmission. The high morbidity and mortality attributed to viral infection has overwhelmed the health systems of most countries across the globe. As of now, there is no confirmed treatment or vaccine against COVID-19. The current pharmacological management relies only on supportive care. Therefore, only non-pharmacological approaches are left to protect people from infection. Established preventive methods against infection include dodging the exposure from the virus, which will break the chain of transmission and prevent further human-to-human spread. In the present paper, we discuss the various non-pharmacological approaches that have to be adopted at the personal or community level and by the healthcare providers to win against this virus.

Keywords: COVID-19, Personal protection, Social Distancing, Quarantine.

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Introduction

The novel coronavirus disease (COVID-19), is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).[1] This disease emerged from Wuhan, China, and was initially considered as just an outbreak. In a short span of 1-2 months, this has spread globally, and was designated as a pandemic by The World Health Organization (WHO) on 11th March 2020.[2]

Recent scientific reports are confident about human transmission and denies airborne transmission.[3] Direct contact, droplet transmission and fomite contact are other possible ways. Differences in transmission characteristics of SARS-CoV-2, compared to previous less severe outbreaks of coronavirus like SARS (2003), has been responsible for more the 2.6 million cases in just 5 months. SARS-CoV-2 is mainly shed from the upper respiratory tract, before the patient even develops symptoms, while SARS-CoV-1 replicated in lower part of respiratory tract and viral loads were associated with symptoms.[4] Infected patients can be asymptomatic or may present with mild respiratory infection. In a small proportion of cases, infection can lead to a potentially fatal severe viral pneumonia causing acute respiratory distress syndrome (ARDS). Therefore, symptom-based case detection is largely ineffective in containing COVID-19.

Need for Prophylaxis

As per the current scientific knowledge, there is no definite cure for COVID-19.[5] Clinical management relies on supportive treatment, and mechanical ventilatory support in worst cases. Special emphasis is given to infection prevention and control measures.[6] There are certain drugs like hydroxychloroquine, chloroquine, and remdesivir, that have been favoured by many clinicians around the world, but lack strong evidence generated through well-designed controlled clinical trials.[7] In addition, there are other pharmacological options including antivirals, immunotherapeutic agents, and plasma therapy which are mostly being tried and tested at local levels. Many vaccines are still in their development phase and will take some time until they can see light of day as per landscape documents prepared by the WHO.[8]

Therefore, only non-pharmacological approaches are left to protect the masses from this lethal virus. The only way to avert infection is by dodging the exposure to COVID-19, and therefore break the chain and further transmission.[9]

Personal Protection Against COVID-19

It is pertinent to understand various concepts of prophylaxis at personal and community level for the masses and specific recommendations for the

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Table: Non-pharmacological prophylaxis against COVID-19 at personal, community, and healthcare provider (HCP) levels.

Personal Level	Community	Healthcare providers (HCP)
1. Voluntary home quarantine	1. Coordinate with different stakeholders	1. Implement triage, early identification, and containment
2. Respiratory hygiene	2. Proactive communication	2. Apply standard precautions
3. Hand hygiene	3. Social Distancing	3. Implementing empiric precautions
4. Avoid touching the face	4. Reduce stigma	4. Collecting and handling laboratory specimens
5. Adequate food hygiene	5. shield extremely vulnerable people	5. Implementing administrative controls
6. Maintain physical activity		6. Management of HCP exposed to the COVID19
7. Maintain mental health		
8. Timely medical care		

healthcare providers that are being implemented internationally (Table).

A. Necessary protective measures to be adopted at a personal level "for normal people" against COVID-19

1. Practice voluntary home quarantine: it implies social distancing at the individual level, where citizens stay at home except for basic needs, and contribute to breaking of the chain of transmission. Certain historical literature mentions the concept of isolation. The famous medical encyclopaedia "The Canon of Medicine," compiled by Persian scholar Ibn Sina (980-1037), also known as Avicenna, describes the benefits of quarantine to control the spread of diseases.[10] He also depicted a method (called as "al-Arba'iniya", that mean "quarantena") to prevent infection through 40-day isolation in hygienic conditions. A recent Cochrane-review compared quarantine vs non-quarantine scenarios and recommends the former, based on the proportions of morbidity and mortality averted compared to the later.[11] However, the review also stressed on the fact that the local context is the most pertinent factor that helps in deciding the duration and severity of the restrictions imposed during quarantine/lockdown by the governments. It is because, this kind of quarantine activity is a new experience to most of the people and may have a range of sequelae, some of which may persist even after the imposed restrictions.[12]

2. Practice hand hygiene: It is essentially the first step of prevention. While hand hygiene interventions are effective in reducing spread of diseases, the magnitude of protection offered can vary due to environmental background and compliance by the community. A previous mathematical model predicted an inhibition of a potential pandemic (between 24%-69%), just by increasing the hand-washings by travellers at all airports.[13] Another systematic review depicted diminution of both influenza and acute respiratory infection among school children with hand-hygiene interventions alone.[14] It is recommended to frequently wash hands with soap and water for minimum 20 seconds (follow WHO advice), or use an alcohol-based hand-rub and air-dry hands after that.[15]

3. Practice respiratory hygiene: These broadly cover sneezing and coughing etiquettes. Usage of handkerchief or tissue is a prudent behaviour. In case handkerchief or tissue is not available, try covering mouth and nose with a bent elbow. One should not spit at public places, and should dispose these tissues in closed dustbins and wash handkerchief after use.

Further, a plethora of protective barriers are available in the market to facilitate respiratory hygiene although with a questionable effectiveness.[9] Another aspect to consider is comfort in wearing masks, especially among healthcare providers that can affect compliance to their use. Clear communication regarding type of mask to be used by community or by healthcare providers is important.[16] This has resulted in excessive stockpiling of the high-efficiency mask by the community, creating a temporary scarcity for healthcare providers.[17]

4. Avoid touching the face: Hands may get infected during various activities, and can transfer the virus to the eyes, nose, or mouth and eventually get access to the body fluids.[18] It is encouraged to cover the face with homemade cloth face-coverings at places with low compliance to social distancing measures (e.g., hospitals, markets), where there are large number of asymptomatic carriers, or there is evidence of community transmission.[19]

5. Practice adequate food hygiene: Consume plenty of liquids and nutritious food during lockdown and/or quarantine to boost the immunity and cope-up with the stress. However, there are many myths and beliefs related to food prevailing in the community. Currently, there is no evidence that COVID-19 is transmitted via food. The virus cannot multiply in food; as it requires an animal or human

host for the same.[20] But, the virus may spread during food handling. So, adoption of simple habits like washing of hands while handling food before and during cooking, and the use of different utensils for raw and cooked foods is vital. WHO clarifies that even in areas experiencing outbreaks, meat products can be safely consumed during the pandemic.

6. Maintain physical activity: Increased stress, disruption of daily routine, decreased access to gym, closure of workplaces, and decreased physical activity can have antagonistic effects on the overall health and well-being of people who are otherwise physically active in normal days. Therefore, physical activity and relaxation techniques are encouraged during this time as they facilitate mindfulness and protect the health of an individual. WHO recommends 150 minutes of moderate-intensity, or 75 minutes of vigorous-intensity physical activity per week, or a combination of both. If a regular schedule is followed at home, then complying to these recommendations is feasible with limited equipment.[21]

7. Maintain mental health: COVID-19 pandemic is once-in-a-lifetime event for many. Such an overwhelming situation can have an impact on the mental health of people, causing fear, confusion, boredom, loneliness, or stigma, and their community with an impact on economy, academics, and scarcity of daily necessities.[22] People may find it difficult to cope up with distress, which may later on translate into a range of psychiatric conditions including depression, anxiety, annoyance, and disappointments, increase in substance abuse, and even insubordination to the local administration's directives.[23] Therefore, it is pertinent to have a concurrent mental healthcare approach during such crucial times. People should be repeatedly sensitised to support one-another, irrespective of the race, societal backgrounds and status of disease. One should only follow the advice and share the information provided by trusted sources about the current status of pandemic.

8. Timely medical care: Prefer staying indoors if you feel unwell. Medical care should be sought if the patient develops fever, cough, and difficulty in breathing. It is vital to follow the advice of the doctors on duty as they have the latest information pertaining to the pandemic.

B. Community prophylaxis

Certain measures need to be adopted to strengthen the preparedness in the community. However, every care must be taken while adapting these recommendations and considering the risk levels, community's cognizance, desires, national and sub-national preparedness, along with the current local situations.

1. Coordinate with different stakeholders: To substantiate the preparation against the pandemic, ensuring timely response is important. It is crucial to connect and coordinate with different stakeholders, who can be of any help. It should be emphasised that health system should focus on empowering the community so that they can lead the local advocacy campaigns for behaviour change, and minimise collateral damage.

2. Proactive communication: Administration should actively engage the community stakeholders in the response process, and promote a two-way communication. This platform can help to increase the awareness in the community of the impending risk, and also understand their behaviour towards the pandemic, existing inhibitions, unmet needs, and mental gaps. Health advocacy programmes should be tailored as per the local circumstances to spread accurate information. Affected populations should be involved from the very beginning and this should be done via multiple routes and levels.

3. Social distancing: It is defined as "the process of deliberately increasing the physical space between people to avoid spreading illness".[24] The term "social-distancing" is actually a misnomer, and the term "physical-distancing" should be preferred. It is implemented in public places where we can expect a crowd of people at different times. The current recommendations suggest a minimum distance of at least six feet between people to call it effective. The effectiveness of social distancing in pandemic containment has been supported by previous research.[11,12] Certain European countries have witnessed an unmanageable number of cases that doubled every 3-4 days, just because of the delays in implementation of this. But, quarantine practiced though social distancing along with other factors like greater duration of confinement, inadequate supplies, difficulty securing medical care and medications, and resulting financial losses have their own implications. The administrations should strategise their plans to getting back to normal at the earliest with minimal disruption.

4. Reduce stigma: Infected patients are under stress and try to evade social interactions and many a times may do not even disclose their actual symptoms due to fear of disease-related stigma. This increases the chances of community transmission. Frequent empathetic communication with such patients can help to reduce stigma, facilitating social assistance and catering to basic needs. Stigma can derail social cohesion and therefore,

precise description of the pandemic can help decrease chaos, avoid misinterpretations of the information, and reduce stigma.[22]

5. Shield extremely vulnerable people: Shielding is a measure used to protect vulnerable people, including children, who are at a very high risk of severe illness from COVID-19 because they have an underlying health condition. It includes minimising all interactions to protect them from coming into contact with the virus. Such groups include solid organ transplant recipients, people with malignancies, respiratory diseases, rare diseases or congenital errors of metabolism, those on immunosuppression therapies, and pregnant women with significant heart disease.[9] These people should be counselled adequately and encouraged to stay at home; avoid community interactions for a period of at least 12 weeks (this time period is subject to change). Communities should also support people who provide essential services to such groups.

C. Prophylaxis for Healthcare providers

Healthcare providers (HCP) are leading the fight against the COVID-19 around the world. They are regularly exposed to hazards, making them highly susceptible to infections. Therefore, we recommend the following principles of personal prophylaxis:

1. Implement triage, early identification, and containment: All patients having symptoms as per the standard case definition, must be considered as a case of COVID-19, until proven otherwise. Such patients must be immediately isolated (source control) and managed after ensuring standard safety precautions. To assist in the early case recognition, the following protocols are recommended:[25]

i. Encourage healthcare providers to be vigilant and up-to-date regarding the disease and its management protocol

ii. Establish a well-equipped fever clinic at the entrance to the centre

iii. Maintain a uniform database of patients who visited these clinics with the help of the latest standard screening tool

iv. Display adequate Information, Education, and Communication (IEC) material at conspicuous places in the health-facilities

v. Continue to maintain the empathetic nature and ensure that the suspected or a confirmed case does not feel stigmatised

2. Apply standard precautions: Patients should be encouraged to practice appropriate hand and respiratory hygiene. Use personal protective equipment (PPE) according to the risk of the patient, apart from the usual injection safety practices, biomedical waste management, decontamination, and sterilization procedures.[25]

HCP should apply WHO's '5 moments for hand hygiene" approach, before and after touching a patient, before and after performing any clinical procedure and exposure to body fluid.[26] The correct use of PPE also helps reduce the spread of pathogens. PPE's effectiveness depends strongly on adequate and regular supplies, adequate staff training, appropriate hand hygiene, and appropriate human behaviour.

3. Implementing empiric precautions: These should be adopted by all the HCPs. This includes contact and droplet precautions, airborne precautions for aerosol-generating procedures, community surveillance, and contact-tracing activities. HCPs should have access to PPE, especially medical masks/respirators, gloves, long-sleeved gown, and face shield.[27] However, the PPEs should be used rationally based on the risk profile of the HCP.[28] In case of shortage, it is advised to reuse N95 masks and respirators after following prescribed guidelines.[29] The HCPs should be trained on donning and doffing techniques beforehand.[30] HCPs should refrain from touching body parts and mobile phones with their gloves on.

4. Collecting and handling laboratory specimens: All specimens collected for laboratory investigations should be regarded as potentially infectious and HCPs should strictly follow standard precaution measures and biosafety practices to minimise the possibility of exposure to pathogens.[31]

5. Implementing administrative controls: HCPs at administrative positions should ensure the safety of the frontline workers through protocols and logistics support. This includes establishing sustainable guidelines in view of local and national conditions; IEC activities; facilitation of prompt laboratory testing; prevention of over-crowding, and provision of dedicated waiting areas and appropriate isolation for patients; and ensure adequate supplies of PPE (PPE Burn Rate Calculator).[32]

6. Management of HCPs exposed to COVID-19 virus: It is recommended to regularly use the exposure risk assessment tool for categorising such HCPs,[33] as the management varies accordingly.

a. Recommendations for HCPs at high-risk for infection:

- Stop all healthcare interactions with patients for a

period of 14 days after the last day of exposure to a confirmed COVID-19 patient;

- Be tested for COVID-19;
- Quarantine for 14 days in a designated setting.

b. Recommendations for health workers at low-risk for COVID-19:

- Self-monitor temperature and respiratory symptoms daily for 14 days after the last day of exposure to a COVID-19 patient;
- Reinforce contact and droplet precautions when caring for all patients with acute respiratory illness;
- Reinforce airborne precautions for aerosol-generating procedures on all suspected and confirmed COVID-19 patients;
- Reinforce the recommended use of PPE;
- Apply WHO's " 5 Moments for Hand Hygiene";
- Practice respiratory etiquette at all times.

Being in quarantine or isolation can be very stressful for the HCPs and may take a toll on their mental health. It is important that their health system should:

- Provide psychosocial support to such HCPs, during quarantine or in isolation.
- Provide compensation for the period of quarantine and for the duration of illness to help them sustain
- Provide a review of infection prevention and control (IPC) training for the healthcare staff.

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