

Technical Report 21



Preparedness and response for community transmission of COVID-19 in Sri Lanka

Irshad Mashood^{1*}, RMTD Rathnayake¹, GS Dissanayake¹, WDJK Amarasena¹, WMPC Weerasinghe¹, Shiyam Ahmed¹, DC Welgama¹, BMI Gunawardana¹, AWPI Gunathilaka¹, Suwani Dasanayake¹, Nirma D Alpitirachchi¹, Iresha Withanage Udayangani Jayawickrama², Charith Amidha Hettiarachchi³, SM Arnold⁴, Ruwan Ferdinando⁴, Athula Liyanapathirana⁴

¹ Post Graduate Institute of Medicine, University of Colombo, Sri Lanka; ² University of Lincoln, UK; ³ University of Technology, Sydney, Australia; ⁴ Ministry of Health, Sri Lanka

*Correspondence: irshadim21@gmail.com

 <https://orcid.org/0000-0001-8218-500X>

DOI: <https://doi.org/10.4038/jccpsl.v26i5.8338>

Received on 16 May 2020

Accepted on 25 May 2020

Highlights

- Control measures based on epidemiological principles and clear directions are critical for mitigation of disease transmission. Sri Lanka is well-recognized for its strong public health system that has been able to control or eliminate many communicable diseases.
- The WHO has recommended ten areas of strategic guidance and training for prevention and control of community transmission that could be adopted to country context. These include, 1. National coordination, 2. Risk communication and community engagement, 3. Public health measures, 4. Case management and health services, 5. Infection prevention and control, 6. Surveillance and risk and severity assessments, 7. National laboratory systems, 8. Logistics, procurement and supply management, 9. Maintenance of essential services, and 10. Research and development.

Background

Coronaviruses belong to a large family of enveloped viruses that cause illness ranging from common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). The on-going 2019-

2020 pandemic of coronavirus disease (COVID-19) is caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). The transmission dynamics of COVID-19 were significantly different to those of the SARS epidemic (1).

The outbreak which originated in December 2019 in

Wuhan, the capital of Hubei Province, rapidly spread in China. Despite vigorous prevention and control measures, the outbreak could not be contained in China and the first case of COVID-19 outside China was reported in Thailand on 13 January 2020. The epidemic was recognized as a public health emergency of international concern (PHEIC) by the World Health Organization (WHO) on 31 January 2020 and was declared as a pandemic on 11 March 2020 (2).

Control measures based on epidemiological principles and clear directions are critical for mitigation of disease transmission (3). Sri Lanka is well-recognized for its strong public health system that has been able to control or eliminate many communicable diseases. The strategy developed and implemented to respond to the current COVID-19 outbreak led by the Ministry of Health together with the military, police, experts and other stakeholders, has successfully contained the outbreak at the stage of cluster transmission. However, every effort should be made to prevent the outbreak from escalating to its next stage - community transmission (4). Communities need to be educated, empowered and mobilized to live in this resultant 'new normal', while government and institutions make the necessary system changes to facilitate this new way of life. Primary objective of this article is to explain the strategies that have been deployed in Sri Lanka so far to prevent community transmission of COVID-19.

Transmission classifications and community transmission

The WHO classification of COVID-19 transmission scenarios for a given locality is based on country/territory/area self-reporting characteristics which should be reviewed on a weekly basis or as new information becomes available. Any geographical area experiencing multiple types of transmission is classified according to the highest risk category based on evidence (4).

Classification transmission scenarios

1. **No cases:** with no confirmed cases

2. **Sporadic cases:** with one or more cases, imported or locally detected
3. **Clusters of cases:** experiencing cases, clustered in time, geographic location and/or by common exposures
4. **Community transmission:** experiencing larger outbreaks of local transmission defined through an assessment of factors including, but not limited to; large numbers of cases not linkable to transmission chains; large numbers of cases from sentinel lab surveillance; and/or multiple unrelated clusters in several areas of the country/territory/area
5. **Pending:** transmission classification not been reported to WHO

Accordingly, community transmission is confirmed as taking place when more cases are reported without a definite contact/exposure (5). The proportion of cases without a definite exposure would therefore be used to predict the risk for community transmission.

There could be many factors that can lead to widespread community transmission in a country. In the USA, to which the 'epi-centre' of the global outbreak was shifted to, widespread community transmission was established by mid-March, and by the last week of April the majority of nearly 800,000 reported cases were due to community transmission (6). Factors that contributed to the acceleration of dissemination included; 1) continued importation of the virus by travellers infected elsewhere; 2) attendance at professional and social events, resulting in amplification in the host locations and multistate spread; 3) introduction of the virus into facilities or settings prone to amplification (e.g. long-term care facilities and high-density urban areas) with the potential for seeding the broader community; and 4) challenges in virus detection including limited testing (7).

In Australia, the proportion of cases without a definitive exposure has been around 10%, depicting no significant community transmission of COVID-19 (8) (Figure 1). However, for better understanding of the effectiveness of control measures, changes in the proportion of this category of cases over time will also need to be considered.

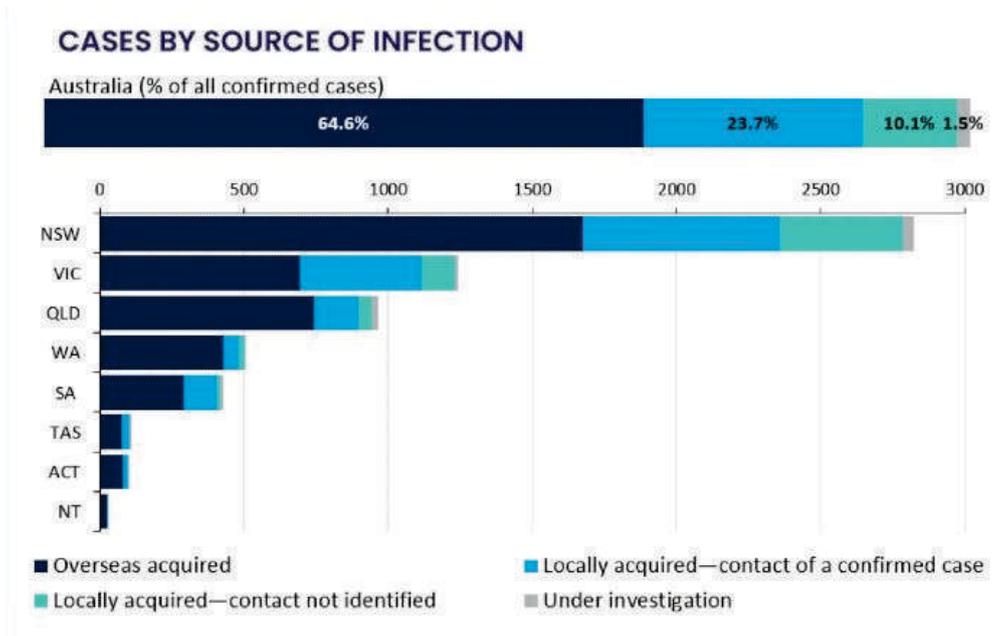


Figure 1: Changes in the proportion of category of cases over time (8)

In Sri Lanka, the first case, a female Chinese tourist was diagnosed on 26 January 2020 and a tour guide diagnosed six weeks later as the first Sri Lankan national. At present in Sri Lanka, the transmission is taking place in a few identified well-defined clusters and the proportion of patients without definitive exposure has remained almost zero. However, it is essential to prevent the outbreak escalating into the community transmission stage through effective epidemiological and public health measures (9).

The impact of community transmission of COVID-19

The scale of socio-economic disruptions caused by the unfolding COVID-19 pandemic is unparalleled in recent history (10). The effects of COVID-19 pandemic have quickly spilled over from the healthcare sector into international trade, tourism, travel, energy and finance sectors, causing a panic in the equity markets worldwide (9) and has already created a significant economic impact globally (11). This will certainly cause adverse health, social and economic outcomes not only in the short-term but in the medium- and long-term as well (1).

This highly contagious disease with a relatively high mortality rate of around 3% has led to the closure or

complete lockdown of cities and countries creating severe social and economic instability (12). Sri Lanka too reacted in a similar manner with many restrictions including island-wide curfew and travel bans imposed since mid-March. These rigorous restrictive measures, along with other epidemiological measures taken in a timely manner have managed to prevent a possible community transmission up to now.

Preparedness and response to prevent community transmission

The WHO has recommended ten areas of strategic guidance and training for prevention and control of community transmission that could be adopted to country context (4). These include, 1. National coordination, 2. Risk communication and community engagement, 3. Public health measures, 4. Case management and health services, 5. Infection prevention and control, 6. Surveillance and risk and severity assessments, 7. National laboratory systems, 8. Logistics, procurement and supply management, 9. Maintenance of essential services and, 10. Research and development. This article mainly describes the importance of these strategies that have been deployed in Sri Lanka to prevent and slow down the spread of COVID-19.

1. National coordination

It is critical to activate national coordination mechanisms as early in the outbreak as possible and well before the widespread community transmission takes place (6). National coordination includes lateral coordination among all sectors at all levels and vertical coordination among the centre and all sub national levels within each of these sectors. In Sri Lanka, the main sectors include health, civil administration, mass media, transport and travel, trade and commerce, agriculture, finance, education, military forces and police. The Government of Sri Lanka appointed a Presidential Task Force early in the outbreak and a National Operation Centre for Prevention of COVID-19 Outbreak (NOCPKO) consisting of multiple stakeholders. This task force is headed by the Minister of Health, with the provincial and district level coordination of health sector carried out by the provincial directors of health service (PDHS) and regional directors of health service (RDHS). At the community level, implementation is carried out by medical officers of health (MOH) and public health inspectors (PHI).

The coordination of laboratory services has been carried out by the Directorate of Laboratory Services and surveillance activities have been coordinated by the Epidemiology Unit. Risk communication has been done by the Health Promotion Bureau (HPB) while the Quarantine Unit is responsible for quarantine and activities at points of entry (POE). Disaster Preparedness and Response Division (DPRD) supports the relevant stakeholders.

2. Risk communication and community engagement

Risk communication aimed at creating community awareness and health promotion for community engagement is essential to control COVID-19 in an effective manner. It is necessary to communicate the preparedness and response strategies; and interventions early and clearly to the public and other relevant sectors (6). Systems should be developed to proactively manage the 'infodemic' of misinformation by detecting and responding to public concerns, rumours and misinformation.

The HPB took the lead in risk communication and public awareness, which was carried out through multiple media platforms including social media (13). Further, public awareness at grass root level was carried out by public health teams and relevant government authorities with special emphasis on those who were in home-quarantine and quarantine centres. Further, the HPB carried out activities such as advocacy, media activities, preparation and dissemination of educational material, communication through a telephone hot line and community surveys.

3. Public health measures

The public health measures were in the form of physical distancing, respiratory etiquette, aseptic procedures and proper use of face masks and other appropriate personal protective measures. Physical distancing was implemented mainly through isolation of cases and quarantining of contacts, advice on maintaining physical distance, enforcing curfew, closure of schools and workplaces, travel restrictions and lock down of smaller geographical areas having a high risk of disease transmission. Aseptic measures such as hand hygiene, cleaning of touch surfaces, respiratory etiquette and appropriate personal protective measures were promoted (6). In the absence of any effective vaccine or pharmaceutical treatment for COVID-19 in the near future, public health interventions will remain as the most important means of preventing and controlling COVID-19 transmission (5). For example, the impact of physical distancing on the reproduction rate (R_t), which will in turn determine the community transmission is illustrated in Figure 2 (14).

Sri Lanka has a specific legislation on quarantine, the Quarantine and Prevention of Diseases Ordinance No.3 of 1897. In addition, provisions in the Penal Code can be applied for preventive activities in COVID-19. Specific regulations were imposed, such as declaration of COVID-19 as a quarantinable disease (Extraordinary Gazette No. 2167/18 dated 20.03.2020) and appointing MOHs and additional MOHs who are implementing the quarantine measures in communities as proper authority for their respective areas (Extraordinary Gazette No. 2168/6 dated 25.03.2020).

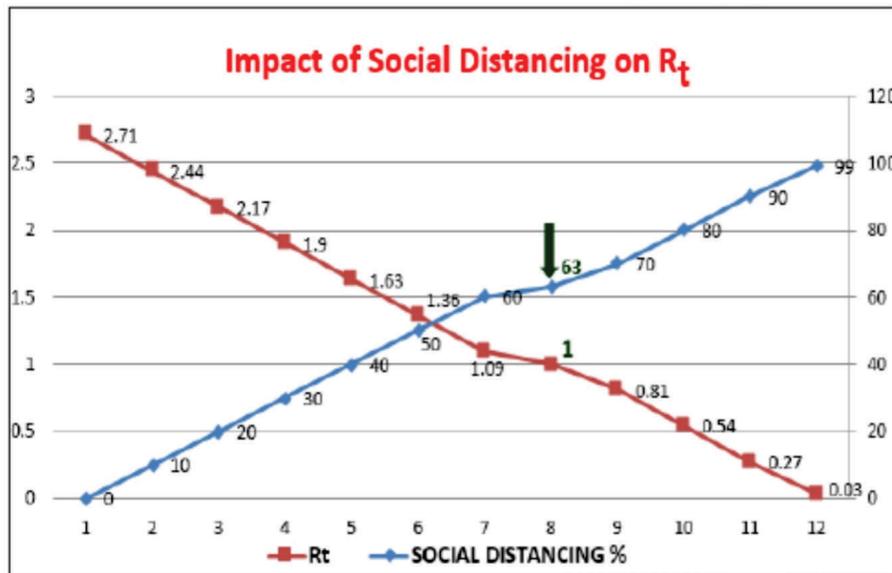


Figure 2: Impact of social distancing on reproduction rate (14)

4. Case management and health services

Curative health facilities were strengthened to manage COVID-19 patients without interruption of routine essential health services. Triage systems were introduced at the out-patient departments to reduce the risk of exposing patients with other illnesses to COVID-19 and to prioritize treatment for high-risk patients (15). Designated hospitals were established for the treatment of COVID-19 patients. Epidemiology Unit of the Ministry of Health in collaboration with other clinical and public health experts, developed and disseminated guidelines/circulars on COVID-19, including case definitions, clinical management circulars and guidelines.

5. Infection prevention and control

Health care staff were trained to treat COVID-19 patients while protecting themselves, even in a situation of community spread. Cross infection among patients was avoided without stigma and discrimination, while both private and government sectors adopted infection prevention and control (IPC) activities. Protecting the health care staff from COVID-19 infection would increase the confidence and sustainability of health care system. Personal protective equipment (PPE) have been managed

based on rational quantification and monitoring and control to avoid wastage and being out-of-stock.

6. Surveillance and risk and severity assessments

The Quarantine and Prevention of Diseases Ordinance provides the legal provision for implementing notification of communicable diseases in Sri Lanka. Epidemiology Unit of the Ministry of Health carries out COVID-19 surveillance to monitor the disease trends and take necessary mitigatory measures timely (16). Early detection of cases is done through active case finding, testing for the disease and contact tracing of exposed contacts, all of which would prevent community transmission. In Sri Lanka, the diagnosis of symptomatic and asymptomatic patients is being done by case finding (passive and active case finding), sentinel surveillance at designated hospitals, random sampling of selected communities and seroprevalence studies (17). In passive case finding, all suspected patients that fit into the case definition are admitted to isolation centres in designated hospitals. Active case finding is done for close contacts of patients, second-level contacts of patients and high-risk groups (neighbourhood of confirmed cases, overseas returnees, healthcare other frontline workers dealing with COVID-19 patients).

7. National laboratory systems

Laboratory facilities to diagnose COVID-19 will reduce treatment delays and in turn the transmission within public (18). This will be helpful for community screening, which has been identified as an effective management option. Around 1500 polymerase chain reaction (PCR) tests are conducted per day in the government sector in government hospital and university laboratories. Further, private laboratories are used for increasing the capacity of investigations, which is monitored by the Ministry of Health. Performing PCR testing enhances the detection of asymptomatic patients. However, the laboratory capacities should be further strengthened to cater to the needs of Sri Lankan returnees from abroad as well as for overseas travellers when the country re-opens.

8. Logistics, procurement and supply chain management

Logistics, procurement and supply chain management must be integrated across national preparedness and response efforts (12). An uninterrupted supply management will definitely support the prevention and control of COVID-19 transmission. The Medical Supplies Division of the Ministry of Health is entrusted with the responsibility of providing logistics especially PPE. The Bio Medical Engineering Services procure the medical equipment especially for the designated hospitals, which have been converted to COVID-19 treatment centres. Both units have been able to maintain uninterrupted supplies which has greatly facilitated the curative and preventive activities.

9. Maintenance of essential services

Basic needs and essential services of the public should be considered as one of prime objectives of the government. Prevention and control will be a nightmare if government does not have the community support. Therefore, a multi strategic plan should be available to address basic needs and essential services (3). National authorities with the support of other stakeholders where necessary, maintained essential services without interruption

during the period of lockdown. Identification of gaps in the delivery of essential health services and modification were done promptly. Non-COVID-19 patients are managed based on their needs including diagnostics, referral and supply of medicines.

10. Research and development

Evidence-based medicine related to COVID-19 is evolving while its management needs more scientific evidence not only at local level but also globally. Various research questions regarding the COVID-19 have been raised. Identifying the mode of virus transmission, source of infection and high risk individuals would be useful in effective management (11).

In Sri Lanka, several stakeholders including researchers in various fields and public health experts have engaged in research and development related to COVID-19 relevant to the Sri Lankan setting. However, being a developing country with scarce resources, Sri Lanka does not engage in large-scale research especially in the development of vaccines and other clinical trials.

Challenges and way forward in the preparedness and response to community transmission

Several challenges are identified in the preparedness and response to prevent community transmission in the context of socio-economic and health background. Economic crisis and social instability are important challenges to face in this pandemic. Adhering to preventive measures is more important among high risk groups (e.g. drug addicts, commercial sex workers), though it has been difficult due to several reasons. Health and other relevant sectors should come up with a mechanism to address the high-risk groups.

Being a tourist destination and having a large number of migrant workers, Sri Lanka has to further develop the core capacities at the points of entry required under the International Health Regulations 2005 to prevent transmission of COVID-19 through borders.

Human behavioural change along with

communication strategies need environmental support. New health promoting lifestyles are important among the public due to the effectiveness of non-pharmacological approach or preventive approach in control of this pandemic. Public health staff should be geared to cater to this new requirement.

Lessons need to be learnt from Wuhan, China, Italy, UK and the USA to prepare as a country in this situation. Sri Lanka should mitigate the consequences of COVID-19 pandemic in all aspects. In this regard, developing multi strategic plans for preparedness and response for community transmission is essential to prevent Sri Lanka becoming a country with rapid community transmission.

Author Declaration

Author contributions: All authors were involved in the planning of the article and in literature search. All authors were involved in the editing manuscript and overall supervision. All authors approved the final manuscript.

References

1. Telles CR. *Covid-19, an overview of virus reproductive emergent social transmission behavior-* opinion/commentary. Available from: <https://doi.org/10.33767/osf.io/2hek4>. WHO. Accessed 24 February 2020.
2. World Health Organization. *WHO Director-General's opening remarks at the media briefing on COVID-19 on 11 March*. Available from: <https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19-11-march-2020>. Accessed 14 May 2020.
3. Ferguson NM, Cummings DAT, Cauchemez S, Fraser C, Riley S, Meeyai A, et al. Strategies for containing an emerging influenza pandemic in Southeast Asia. *Nature* 2005; 8; 437(7056): 209-214.
4. World Health Organization. *Critical preparedness, readiness and response actions for COVID-19*. Available from: [https://www.who.int/publications-detail/critical-preparedness-readiness-and-](https://www.who.int/publications-detail/critical-preparedness-readiness-and-response-actions-for-covid-19)

[response-actions-for-covid-19](https://www.who.int/publications-detail/critical-preparedness-readiness-and-response-actions-for-covid-19). Accessed 1 March 2020.

5. World Health Organization. *Responding to community spread of COVID-19*. Interim guidance, 7 March 2020; 1-6. Available from: <https://extranet.who.int/iris/restricted/handle/10665/331421>.
6. Liu J, Liao X, Qian S, Yuan J, Wang F, Liu Y, et al. Community Transmission of Severe Acute Respiratory Syndrome Coronavirus 2, Shenzhen, China, 2020. *Emerging Infectious Diseases* 2020; 26(6): 1320.
7. Jernigan DB, CDC COVID-19 Response Team. *Update: public health response to the coronavirus disease 2019 outbreak - United States*. Center for disease Control and Prevention. US Department of Health and Human Services, Morbidity and Mortality Weekly Report (MMWR), 24 February 2020; 69(8); 216-219. Available from: <https://doi.org/10.15585/mmwr.mm6908e1>.
8. ABC News. *What does community transmission of coronavirus mean?* Available from: <https://www.abc.net.au/news/2020-04-11/what-is-community-transmission-of-coronavirus-covid-19/12142638>. Accessed 13 May 2020.
9. Daily Mirror Online. *COVID-19: clusters and stages explained*. Available from: <http://www.dailymirror.lk/recommended-news/Covid-19-%3A-Clusters-and-Stages-Explained/277-185810>. Accessed 19 May 2020.
10. Longini IM, Nizam A, Xu S, Ungchusak K, Hanshaoworakul W, Cummings DAT, et al. Containing pandemic influenza at the source. *Science* 2005; 309(5737): 1083-1087.
11. Johnson HC, Gossner CM, Colzani E, Kinsman J, Alexakis L, Beauté J, et al. Potential scenarios for the progression of a COVID-19 epidemic in the European Union and the European Economic Area, March 2020. *Eurosurveillance* 2020; 25(9). Available from: <https://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2020.25.9.2000202>.
12. World Health Organization. *2019 Novel Coronavirus (2019-nCoV): Strategic Preparedness and Response Plan 2020*: 28. Available from: <https://www.who.int/publications-detail/strategic-preparedness-and-response-plan-for-the-new-coronavirus>.

13. Health Promotion Bureau. *Live updates on New Coronavirus (COVID-19) outbreak*. Available from: https://www.hpb.health.gov.lk/en_ Accessed 14 May 2020.
14. Jha V, Dinesh T, Nair P. Are we ready for controlling community transmission of COVID-19 in India? *Epidemiology International* 2020; 5(1): 10-13. DOI: 10.24321/2455.7048.202003.
15. Ministry of Health, Sri Lanka. *COVID-19 (new Coronavirus) Outbreak in Sri Lanka Interim Guidelines for Sri Lankan Primary Care Physicians, version 3.1, 23 April 2020*, Sri Lanka. 2020:1-37. Available from: <https://hpb.health.gov.lk/media/pdf/interim-guidelines-primary-care.pdf>.
16. Epidemiology Unit. Sri Lanka. *Weekly Epidemiological Report*. Colombo: Epidemiology Unit, Ministry of Health 2010; 37 (October): 1-4.
17. Epidemiology Unit. *COVID-19 Laboratory Test Strategy in Sri Lanka*. Colombo: Epidemiology Unit. Ministry of Health Nutrition and Indigenous Medical Services, Sri Lanka, 2020. Available from: http://epid.gov.lk/web/images/pdf/Circulars/Corona_virus/final_draft_of_testing_strategy_v_2.pdf. Accessed 26 May 2020.
18. Anderson RM, Heesterbeek H, Klinkenberg D, Hollingsworth TD. How will country-based mitigation measures influence the course of the COVID-19 epidemic? *Lancet* 2020; 395(10228): 931-934. DOI: 10.1016/S0140-6736(20)30567-5.