UNIVERSITY OF COLOMBO
DemARS2022

International Research Conference

POPULATION AND SUSTAINABLE DEVELOPMENT

PROCEEDINGS

Department of Demography
Faculty of Arts
University of Colombo
Sri Lanka

08th December 2022

3rd International Research Conference
(9th Annual Research Symposium)
DemARS 2022

Population and Sustainable Development

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Time **5.00 pm - 5.55 pm** **(UTC)** **11.30 am** **12.25 pm**	**Migration, Urbanization and Sustainable Communities** **Session: Evening D** *Session Chair : Professor P. Hewage*
5.00-5.10 pm	Public awareness of developing smart cities: A thematic analysis G. D. Mathews
5.10-5.20 pm	Well-being of migrant workers as a step toward achieving SDGs Sharmila. P. Nayak
5.20-5.30 pm	Intention of Sri Lankan International labour migrants to return during the Covid 19 pandemic. I.P. Kalansooriya
5.30-5.40 pm	Green cities as a new approach for planning and developing cities in Sri Lanka W.A.W.P. Wijayalath
5.40-5.55 pm	***Discussion***

Time **5.00 pm - 5.55 pm** **(UTC)** **11.30 am** **12.25 pm**	**Covid-19 and Sustainable Development** **Session: Evening E** *Session Chair: Professor Suresh Babu*
5.00-5.10 pm	Sustainable land use planning for coastal resilience; a case of Colombo, Sri Lanka. H.M.M. Herath
5.10-5.20 pm	Unsystematic disposal of facemasks and related environmental health threats during Covid-19 in Sri Lanka F. Ruzaik
5.20-5.30 pm	Impact of COVID-19 pandemic on reaching sustainable development goals T. J. Udayajeewa
5.30-5.40 pm	The issues and challenges faced by undergraduates in online learning during COVID-19 outbreak W.P.N.L. Sumathipala
5.40-5.55 pm	***Discussion***

Unsystematic disposal of face masks and related environmental health threats during Covid-19 in Sri Lanka

F. Ruzaik[1]

Introduction

The Covid-19 outbreak negatively affected the entire world in terms of its socio-cultural, economic and environmental dimensions; killing 800,000 people and infecting 22.7 million, which includes 45,000 deaths and 3,000,000 infected cases in Sri Lanka. Social distancing, hand washing, sanitizing and wearing face masks are preliminary precautionary actions frequently announced by the health authorities in Sri Lanka. Ultimately, the last became a mandatory requirement in public gatherings and public places, which was closely monitored by security officials. The government and private sector organizations imported and manufactured a variety of masks to meet these higher demands. Out of which, 60-70 percent are one-time usable facemasks. Consequently, the unsystematic disposal of face masks to the environment has become a large threat to environmental health including the health of the general public. Sri Lankan health authorities and health professionals provide frequent announcements to adhere to health instructions to avoid the spread of this novel coronavirus, under the provision of Quarantine and Prevention of Diseases Law No. 12 of 1952; whereas equal importance and guidance have not been given in terms of its disposing or recycling masks in a safe manner since most of these masks contain plastics and are made of petroleum-based non-renewable polymers that are non-biodegradable, hazardous to the environment, and create health issues. One of the areas where the environmental impacts of COVID-19 are most pronounced is in waste management (Fisseha S, et al. 2021).

The most relevant literature has been reviewed, using related books, research articles, international journals, reports and various documents related to this research topic. Accordingly, the main function of a face mask is to protect the individuals from contracting and transmitting the viral infections. Hence, it is imperative to cover the mouth and nose because the viruses are transmitted through air droplets to other people, when they cough, sneeze, breathe, and talk. During the mid of March 2020, when COVID-19 infection was at its peak, the World Health Organization (WHO) instructed people to wear masks so that community spreading can be minimized. Further, the WHO initially instructed that it is necessary for healthy people to wear masks only if they are taking care of infected patients. Later, considering the advantages of using a mask, healthy people were also advised to wear masks to reduce the risk of getting exposed to

[1] Department of Geography, Faculty of Arts, University of Colombo, Sri Lanka

infections from asymptomatic people (WHO, 2021). Said instruction was followed by the health authorities all over the world and demanded a larger supply of face masks, which resulted in more accumulations in the respective country's waste stream.

There has also been a report that cloth masks (70% cotton and 30% polyester), which contain three layers, exhibited nearly 40-60 percent filtration efficiency (Dharmaraj et al. 2021). Sri Lanka's environment is facing a looming threat owing to the haphazard disposal of millions of such used face masks and personal protective equipment as revealed in a recent study by the University of Kelaniya. It is reported that Sri Lanka generates around 14 to 70 million face masks as waste a week" (Jayasinghe et al.2022).

According to Jayasinghe (2022), "It should be understood that disposable face masks, which are generally known as surgical face masks or K-95 masks contain polypropylene which is a popular kind of plastic. According to the study's findings, a K-95 mask contains about 9 grams of polypropylene and this value is around 4.5 grams in a surgical face mask. By looking at these numbers, it is estimated that as a country Sri Lanka emits 47,185 tons of polypropylene per week to the environment through face masks only. and plastics are non-biodegradable material as it takes over 500 years to get rid of it from the environment".

The WHO (2020) estimates that nearly 89 million face masks are needed worldwide to control COVID-19 each month. According to the Ministry of Environment (2022), approximately eight billion surgical masks were used during the last 24 months from early February 2020 to February 2022. If each face mask weighs 4 grams approximately, this is equivalent to 32,000 metric tons of general waste generated over the past 24 months. Considering each garbage truck transports 8 metric tons of trash, Sri Lankans have used enough face masks to fill 4,000 garbage trucks in the last 24 months. This will add more weightage to the existing waste generation (7500-8000 MT/day) of the country. All municipality areas are responsible for 80 percent of the total waste generation and the western province accounts for 60-65 percent of total waste generated per day. The Municipal Authorities managed to collect approximately 50 percent only. The balance 50 percent of solid waste end up in water bodies, canals, low-lying areas, bare lands, around the so-called disposal sites and also haphazardly scattered in the municipality limit (Ruzaik, F. 2020). Blocking of channels and drainage lines, especially in the urban area cause flash floods and will provide room for spread of vectors/mosquitoes. Moreover, the accumulation of used facemasks to the waste stream will have additional impacts and high risks to the ecosystems, including human health.

Research objective

The main objective of the study is to assess the possible environmental threats caused by the unsystematic disposal of used facemasks during Covid-19 pandemic in Sri Lanka.

Methodology

The required data were collected through an online questionnaire survey, representing all districts of the island and relevant secondary data was also used for this study.

Data collection

A structured questionnaire was prepared according to the objectives of this study, which was circulated in the form of a Google form to selected target groups and collected information collated according to the requirement of this study. Accordingly, 256 respondents, over 18 years of age, provided information. Out of which 44.7 percent is male and 55.3 percent is female. The questionnaires that can be categorised as 126 (49.2%) from the general public, 51 (20%) from professionals, 42 (16.4%) from university students and 37 (14.4%) from vendors are incorporated for this study. Analysis shows that 153 (59.6%) of Sinhalese, 50 (19.6%) of Tamils and 53 (20.8%) of Muslims have responded to this questionnaire. The convenient sampling method was used and sample areas were identified randomly.

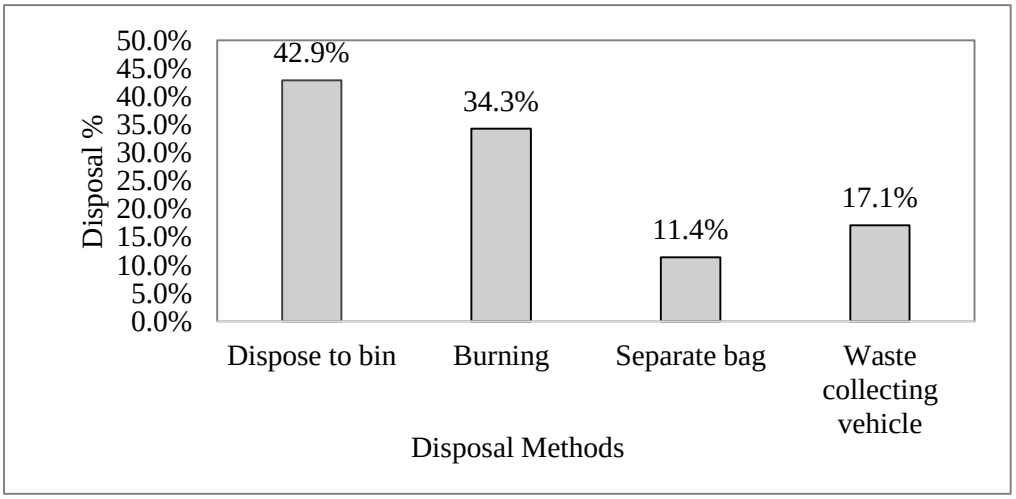
Result and discussion

The questionnaire majorly focused on identifying the types of facemasks used in Sri Lanka and also investigated the disposal practices to assess the unheeded environmental threats to the environment during Covid-19 pandemic period.

Identification of types of mask

Recurring announcements and guidelines of Sri Lankan health authorities and health professionals provide standard awareness among the general public about the use of face masks and it has become a mandatory requirement in public places. The government and private sector organizations produce a variety of face masks with different materials. Surgical, fabrics, plastic, and fabric and plastics are commonly used in Sri Lanka.

Figure 2: Different practices of disposal of facemasks (%)



Source: Sample survey, 2021

Further, this study identified that 53 percent of people use disposable face masks as single use, which will become a cause for quick environmental burden, degrading the health of the environment as well as that of the people.
This study reveals that a higher percentage of (42.4%) the general public tend to use surgical face marks especially in urban areas due to its low cost (LKR 7/- / mask) and also because most of them are provided free of charge by their employer.

Hence, it is advisable to manufacture one time usable and disposable face masks with biodegradable materials at lower cost. This will increase affordability and thereby face mask use by people even in the rural community.

Disposal practices of used facemasks and its impacts
Wearing face masks in public places is mandatory under Sri Lanka's COVID-19 guidelines and the Ministry of Environment stated that Sri Lankans used and disposed of about 140 million face masks in 2020. According to information received from the Ministry of Environment, about five million surgical face masks and one million KN 95 face masks are being discharged into the environment daily. At present, there are three categories of people using masks. First is the infected people; the second group is those who are quarantined after having associated with the infected, and the third consist of those who wear masks to protect themselves. Face masks add up to six million a day, which means 180 million a month (Ruzaik & Begum, 2021). Nearly 1.5 million surgical masks are in daily use within the country (Dharmaraj et al. 2021).

The public must understand that most face masks are made out of petroleum-based non-renewable polymers that are non-biodegradable, hazardous to the environment and create health issues. This study demonstrates the extensive use of facemasks and how it affects human health and the ecosystem.

The study identified three major instances of face masks being discarded to the environment and accordingly nearly 76 percent of fabric masks are disposed of, since they get torn/discolored. The improper disposal of facemasks will create various challenges to our living/domestic environment. A remarkable amount of facemasks have been identified besides roads, beaches, and in public places. These masks will finally end up in water channels and drainage lines with rain runoff water.

Conclusion

COVID-19 indiscriminately attacks people of all ages and all nations. The virus has a peculiar behavior, which makes its prevention very complex to manage with a simple preventive approach. Social distancing measures together with hygiene practices are considered to contain the virus. The universal use of face masks can reduce the transmission of the virus at the source and contribute to the containment of the disease. Protection of environmental health is key to battling the spread of pandemics, while effective use and disposal of facemasks is essential to minimize possible secondary impacts upon health and the environment. Therefore, continuous awareness creation and sensitization training on the proper use of face masks and their disposal should be made at all levels of the community. Familiarizing face masks with the community also helps the future management of respiratory-related infectious diseases or similar pandemics.

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