Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Rationing PPEs during a pandemic: The COVID-19 scenario

The Ministry of Health & Family Welfare, Government of India (MoHFW, GoI) has been providing guidelines[1,2] for the rational use of PPEs at different health care settings, such as, outpatient services (including triage, screening, waiting and consultation areas), in-patient services (including isolation wards, ICU care areas), emergency department, pre-hospital (ambulance) services, community care areas (including quarantine facilities) and other supportive/ancillary services (namely, laboratory, mortuary, CSSD [Central Sterile Supply Department]/laundry areas). Similar strategies have been put forth by the Centers for Disease Control and Prevention (US)[3] toward prudent usage of PPE.

To tide over the shortage of PPEs, the MoHFW, GoI has also released guidelines for the meticulous reuse of N95 respirators,[4] i.e., using each N95 respirators for five times by adhering to appropriate storage conditions – the same has been recommended by the CDC (US).

As on June 2nd 2020, informal estimates[5] state that the medical fraternity has lost more than 1000 healthcare professionals including 10 from India during the care of COVID-19 patients. Hence, it is imperative that our frontline warriors are well guarded with appropriate PPEs. In line with the WHO's call for increased production of PPEs,[6] India has to produce nearly 2 lakh PPE kits per day.[7]

We are reporting from a designated COVID-19 government hospital[8] catering to a population of 1.39 million. As the Officers In-Charge of Pharmacy, we deal with procurement, storage, and distribution of personal protective equipments (PPEs) to healthcare providers in our set-up. Accordingly, we report daily to the COVID-19 core committee regarding the usage of PPEs among the various departments/units.

The Pharmacy main stores receives the PPEs from various sources and stock the same. From this main stock, the PPEs are further distributed to requisite areas/departments and sub-stocks are maintained there. The requisite areas/departments include Donning area, Central lab, VRDL (Virus Research and Diagnostic Laboratory), Mortuary, and Screening area. From these sub-stocks, the designated staff in-charge of the particular area/department will actually distribute the PPEs to the concerned healthcare professionals following necessary documentation.

We enclose a Microsoft Excel spreadsheet (Appendix A) that was exclusively developed and customized for reporting of daily utilization of PPEs on a monthly basis. The CDC (US) has also released a PPE Burn Rate Calculator[9] which is a spreadsheet-based model serving healthcare facilities to plan and optimize the use of PPE for response to COVID-19.

The Microsoft Excel spreadsheet contains the following row headers denoting the different hospital settings, namely, Pharmacy main stores, Donning area, Central lab, VRDL, Mortuary, and Screening area. The column headers denote the days in a month with space for actual date entries. The spreadsheet is prepared in such a way that all the formulae are locked (and protected) so that the entire data entering process will be error-free. The data can be entered only on the day of utilization, i.e., the next day data entry column will be enabled for data entry only after completion of the current day entry. The spreadsheet is also designed such that the previous day closing balance in different areas is automatically transferred as the opening balance of the next day. For each area/department only two cells have to be entered, namely, the received and issued/utilized. The numbers in all other cells are auto-populated once these two cells are filled and the details of total balance, total utilized, and average utilization per day are generated in real-time.

Apart from scrupulous maintenance of PPE distribution, exclusive WhatsApp groups for monitoring PPE usage, reusage of N95 masks and goggles, and procurement of reusable elbow gloves were some of the other measures undertaken in our institute for rational use of PPEs.

Hopefully, our customized and dynamic Microsoft Excel spreadsheet would also aid the professionals involved in managing the PPE distribution in this pandemic – particularly in resource-constrained settings.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.sapharm.2020.06.008.

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[1] A dedicated government COVID-19 hospital in Puducherry (Southern region of India)