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**Availability of PPE during the
COVID-19 pandemic**

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health care workers in India**

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Introduction

India, like almost all the countries in the world, is battling the COVID-19 pandemic and healthcare workers are on the frontline in this battle. It has been established that COVID-19 is chiefly transmitted via respiratory droplets. It is also known that certain medical procedures such as endotracheal intubation can aerosolize the respiratory droplets of an infected person and thus pose greater risk for healthcare professionals. [1] Also collection of naso-pharyngeal specimen for RT-PCR testing using nasal swab can at times cause nasal irritation and sneezing or cough, thereby increasing chances of infection from respiratory droplets to health staff. Based on this, it has been recommended that healthcare professionals, especially those who might come in direct contact with COVID-19 patients, use adequate Personal Protective Equipment (PPE).[2] In addition to availability of PPE, adequate training is a key requirement to equip healthcare workers to use PPEs effectively.[3] The Ministry of Health and Family Welfare has put out guidelines regarding the rational use of PPE that specify the appropriate PPE for various healthcare settings.[4] The WHO has also put out guidelines regarding rational use of PPE and interim guidelines regarding use of masks in the context of COVID-19.[5] However, numerous reports have emerged in various news media about the lack of availability of PPE,[6] thus putting the vital healthcare workforce at risk of exposure and infection by the SARS-CoV-2 virus.[7,8] Numerous reports regarding health care worker infections with SARS-CoV 2 have also emerged. Right from the early stages of this pandemic, reports of infections emerged, beginning with China. By 24th February 2020, 2055 health care workers had been infected in China and 22 had died.[9] By beginning of April, 8 per cent of Italy's total infections were among healthcare workers.[10] According to the International Nurses Council, at least 90,000 healthcare workers have been infected in this pandemic and at least 260 have died. [11] They also raise a grave concern of underreporting of healthcare worker infections and deaths.

It is well known that India has a huge shortage of healthcare workforce compared to the recommended doctor/nurse to population ratios.[12] In this situation, exposure of health care workers to SARS-CoV-2 infection not only places the health care workers themselves at risk, but also depletes the available health care workforce to deal with this public health emergency when health care workers are forced to go into isolation or quarantine. In addition, health care settings are places that see multiple footfalls, and infected health care workers can contribute to such settings becoming super spreaders of the infection. Thus,

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the safety of the healthcare workers is crucial for the country as a whole to control the spread of this disease and minimize mortality.

There is a dearth of studies from India that throw light on the availability of PPEs and adequate training for their use. According to statements by the Government of India and various state governments, there has been a large increase in production and supply of various types of PPE. However, how this has impacted availability of PPE on the ground is not well documented. In this situation, there was a need to assess the situation of availability of PPE at the ground level across different geographical contexts and diverse health care settings across the country. This study was planned as an effort to address this gap.

Objectives

1. To understand the availability of PPE for various cadre of healthcare workers in different health care settings in India during the COVID-19 pandemic.
2. To understand the knowledge among various healthcare workers currently providing healthcare in India about appropriate PPE required by them during the COVID-19 pandemic.
3. To understand what proportion of healthcare workers have received training to use PPE during the COVID-19 pandemic.
4. To understand the concerns of health care workers in diverse healthcare settings in India regarding PPE during the COVID-19 pandemic.

Methodology

This study was cross-sectional in design and used a semi-quantitative survey that was self-administered by different levels of health care workers using an online medium. The limitation on the researchers' mobility during the lockdown was a key factor in determining the use of this methodology.

A semi quantitative survey tool was designed with multiple-choice questions (MCQs) and a few open text questions to capture responses as related to the research objectives. These included questions to assess the participants' perception of the PPE required by them according to the health care setting they worked in, actual availability of different components of PPE over the previous week, details of disposal and reuse, any training received on PPE, any fears and concerns they had, and any discrimination they perceived in receipt of PPE. This questionnaire was designed into a google form that could be self-administered. Google form was chosen as it could be easily self-administered and could be easily disseminated using a simple link.

The survey form was made available in two languages, English and Hindi. Practical difficulties because of the researchers' own language proficiencies precluded provision of the survey forms in other Indian languages. In order to address this limitation, and also to address lack of access to smartphones and internet and network access in remote areas, an option of telephonic survey was also built into the study, wherein the researchers administered the form verbally over the phone to participants who preferred this. Marathi, Tamil, Malayalam and Hindi were the languages that were covered through such telephonic

surveys. A pilot study was conducted with seven persons with both the English and Hindi forms and issues identified during such piloting addressed.

As the survey was done through an online methodology, the sample of respondents was self-determined by those health care workers who chose to respond to online invitations. Thus, the sample was purposive. Efforts were made to get responses from a diverse group of healthcare workers including those working in both hotspot and non-hotspot districts, in public and private sector, and across diverse health care settings including community, health care facility, and designated COVID facilities. Networks such as Medico Friend Circle (a nation-wide platform of pluralist, secular, pro-poor health professionals, scientists and activists), Jan Swasthya Abhiyan (Indian chapter of the People's Health Movement) and Swades (a WhatsApp group with 250 pro-people health professionals) were contacted to invite respondents for the survey. Invitations to participate were disseminated through various social media including Facebook, Twitter, Instagram and WhatsApp. In order to reach different cadres of health care workers (HCWs) in the public, private and non-profit sectors, specific associations of each HCW cadre were also contacted including those of doctors, nurses, lab technicians, and community level workers (ANMs and ASHAs). Multiple reminders were regularly sent out to ensure maximum participation from the contacted groups.

Ethical approval for this research was obtained from SOCHARA (Society for Community Health Awareness, Research and Action) Institutional and Scientific Committee (SISEC), Bengaluru, Karnataka. All respondents were provided with an information sheet to read through in English and Hindi that detailed the objectives of the research and also spelt out the benefits, potential harm if any, arising out of the research and ethical safeguards taken to minimize harm. Participation was entirely voluntary. The Google Form had an informed consent form for participation in the study in both English and Hindi embedded into it such that the participant had to record his/her consent for participation in the study before the survey form could be accessed. For the telephonic survey, detailed information regarding the study was given over the phone, consent was voice recorded, and interviews conducted subsequently. No information that revealed the identity of the respondent was collected. All data was downloaded on password protected computers that could be accessed only by the research team.

Data collection was done online between 06 and 18 May 2020.

Limitations

The respondents were invited to participate in the study using social media and personal and professional contacts of the investigators. Given the limitations of the online methodology and the practical difficulties due to the lockdown, the number of respondents is only a very small proportion of health care workers in India. Thus, the results of the study cannot be generalized to all health care workers; rather, the study provides an indication of the prevalent situation of PPE in different health care settings in the country. In spite of the above limitations, it is noteworthy that the respondents of the study work in 26 States and Union territories, and hail from a wide range of healthcare worker cadres.

Results

Characteristics of respondents

A total of 392 respondents provided consent and participated in the online study.

Of the total respondents, 182 (46.91%) belonged to the age group 20-29 years. Mean age of the respondents is 42.2 years (Table A1 in Annexure). 209 (53.32%) respondents were male and 182(46.43%) were female (Table A2). There were 155(39.54%) doctors, 103 (26.28%) medical students (postgraduate residents and interns), 34(8.67%) nurses and 27(6.89%) Community Health Workers of various cadres amongst the respondents (Table 1).

Table 1: Respondents' designation		
DESIGNATION	NUMBER	%
N=		392
Doctor	155	39.54%
Medical student	103	26.28%
Nurse	34	8.67%
CHW	27	6.89%
Public health officer	9	2.30%
Technician	10	2.55%
Admin staff	2	0.51%
Dentist	7	1.79%
Other	45	11.48%
TOTAL	392	100%

Figures 1-3 (Tables A3-A5) show the distribution of respondents by the level of care they worked in, by their work area, and by the type of health facility they spent maximum time in. Of the 392 respondents, more than half (229, 58.42%) worked in public sector facilities (Figure 3, Table A5)

Figure 1: Distribution of respondents by level of care

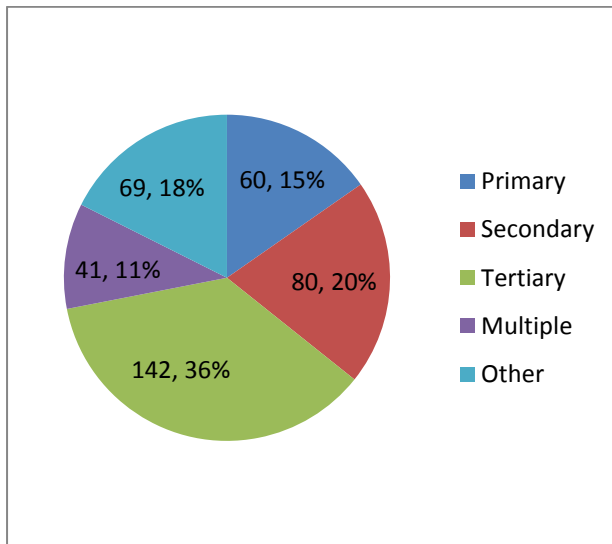


Figure 2: Distribution of respondents by work area

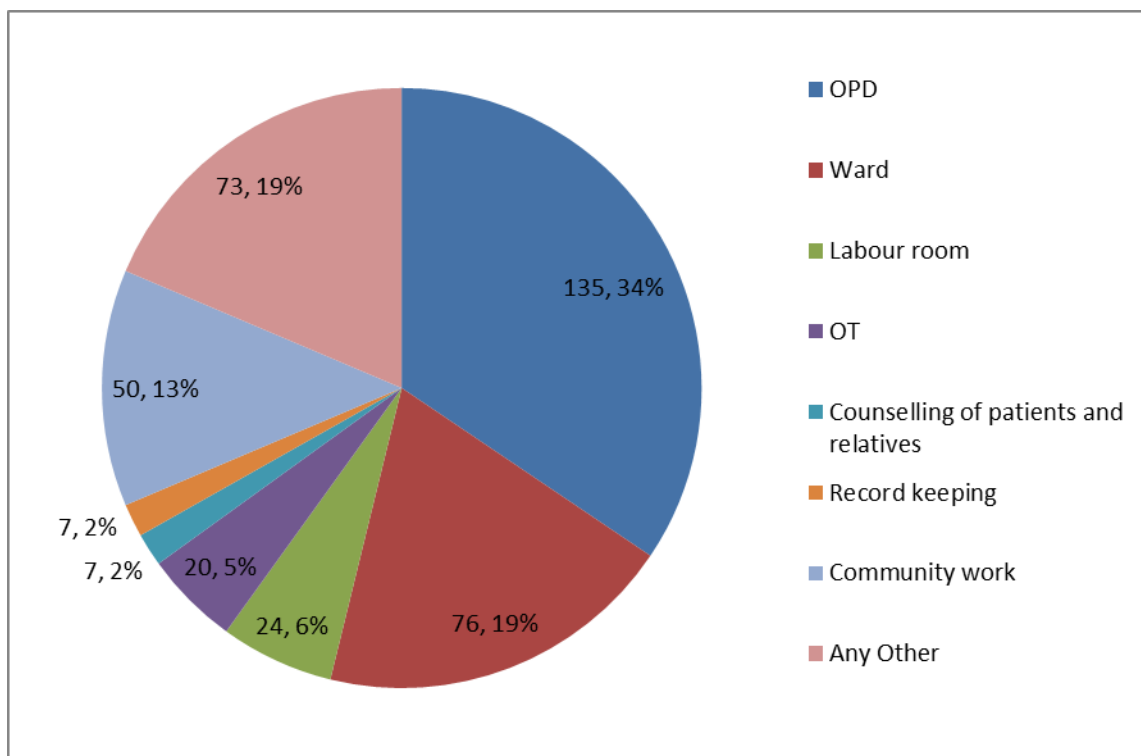
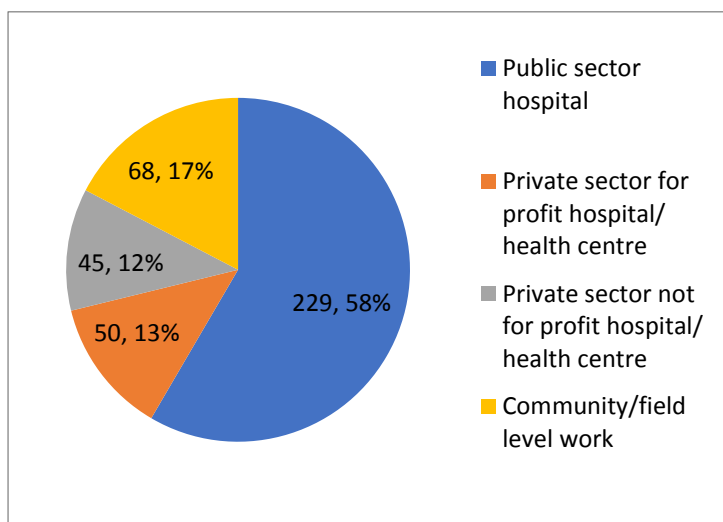


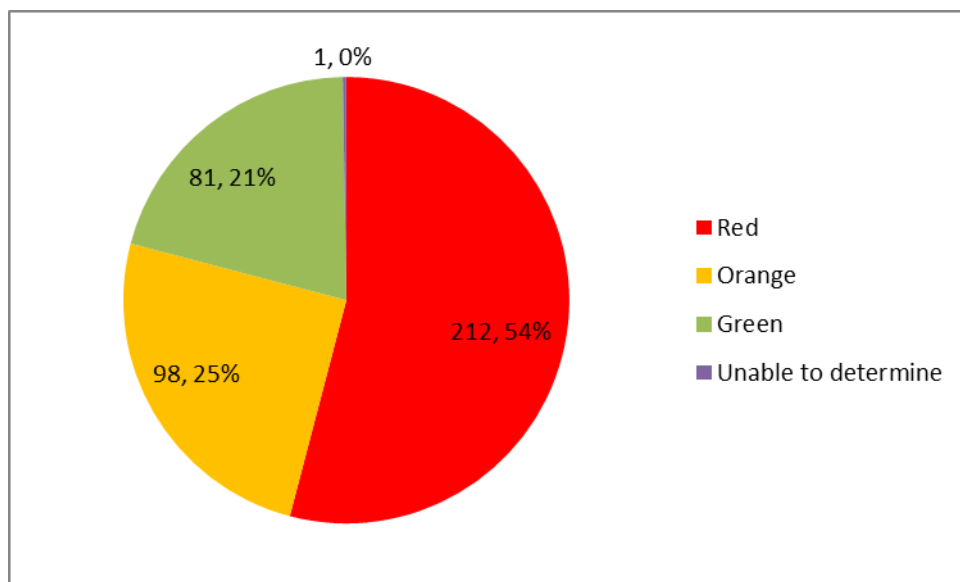
Figure 3: Type of facility that the respondents spent maximum time in



Of the 155 doctors who participated in the survey, 71 were specialist doctors, 79 Medical Officers with MBBS degree, 5 AYUSH practitioners (Table A6).

The respondents belonged to a total of 26 States and Union territories. Of the 392 respondents, **more than 50% were from 3 states:** 100 (25.51%) were from Maharashtra, 58(14.8%) belonged to Tamil Nadu and 44 (11.13%) were from Madhya Pradesh (Table A7). The respondents belonged to more than 150 districts and 33 (8.43%) belonged to Mumbai. Of these, **212 (54.08%) belonged to Red Zone districts**, 98(25%) belonged to Orange districts, 81 (20.66%) belonged to Green districts (as defined by MoHFW notification dated 3 May, 2020) (Figure 4, Table A8).

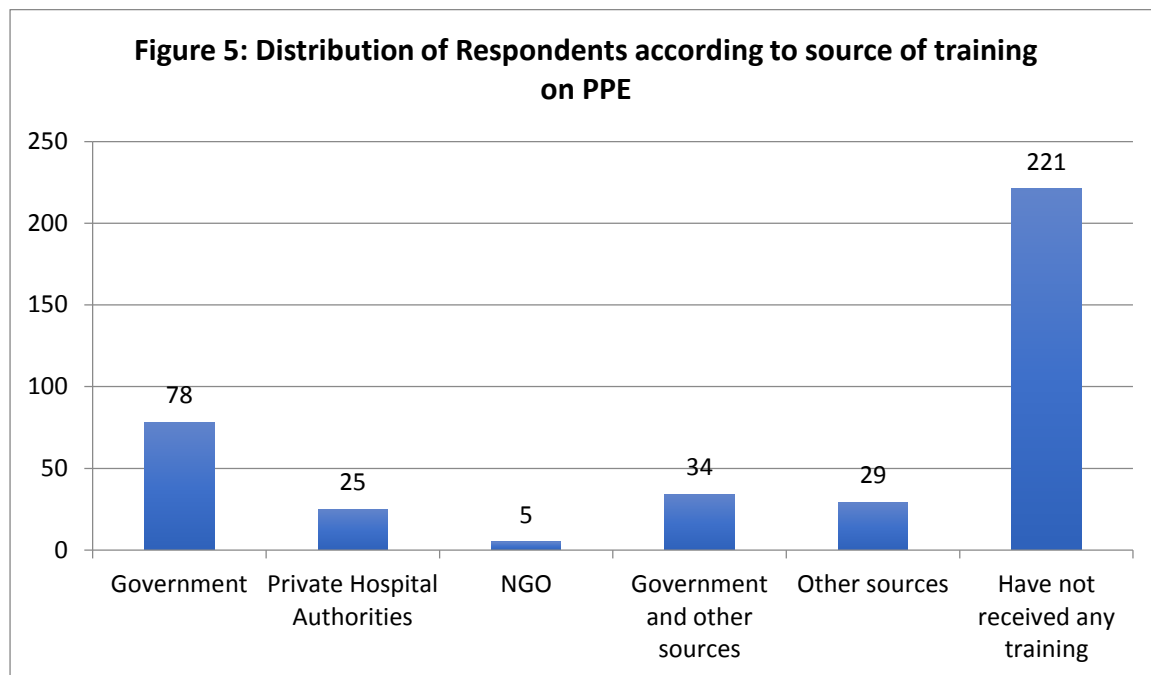
Figure 4: Colour zone of district respondents worked in



183(46.68%) of the 392 respondents were working in Designated COVID centres (Table A9) Of the 155 doctors, 88 (56.77%) worked in designated COVID centres (Table A10) 75(48.39%) of these doctors worked in districts that are classified as Red Zones (Table A11).

Training and Knowledge regarding appropriate PPE

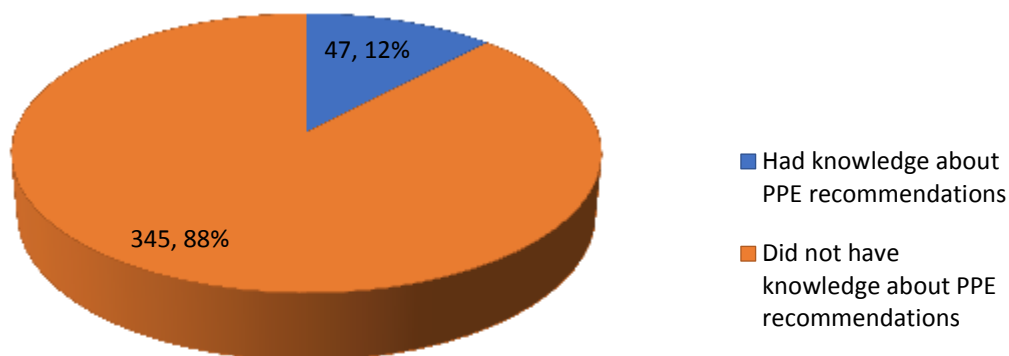
To questions on whether they had received any training on PPE use during the COVID pandemic, **over half of all respondents (221 of 392, 56.38%) reported that they had not received any training regarding use of PPE** (Figure 5, Table A12) Of the 171(43.62%) that reported that they have received training, 78(45.35%) have received training from government authorities. **About a fifth (81 of 392, 20.67%) reported that they had self-taught themselves on PPE using Whatsapp / Youtube videos or had learnt from colleagues.** (Table A13)



The situation on training was slightly better in health care workers working in red zone districts – even so, only less than half (48.11%) of those working in these critical districts reported that they received training regarding use of PPE (Table A14). Even amongst those working in COVID designated centres, just over half (103 of 183, 56.2%) received training (Table A15). The training status in Tamil Nadu was relatively less, with 63.7% reporting that they did not receive any training. (Table A16).

Participants responded to questions on what they thought was the PPE required by them for the health care setting they worked in. This was then compared against the recommended PPE for their area and type of work as per MoHFW guidelines.[4] Based on this, their perception of the PPE required by them was classified as either appropriate or inappropriate, where their knowledge was considered appropriate if it matched the recommendations, and it was considered inappropriate if the respondent's perception on their need for PPE was either less than or more than what was recommended. **A majority of respondents (345 of 392, 88.01%) did not have knowledge of appropriate PPE recommended as per their work setting.** (Table A17)

Figure 6: Knowledge of Appropriate PPE recommended according to area of work (N=392)



The knowledge was even less amongst respondents working in red zone districts - only 15 of 212 respondents (7.08%) from red zone districts had knowledge regarding appropriate PPE for their workplace (Table A18). Similarly, a vast majority (163 of 183, 89.07%) of those working in COVID designated centres did not have correct knowledge of appropriate PPE (Table A19).

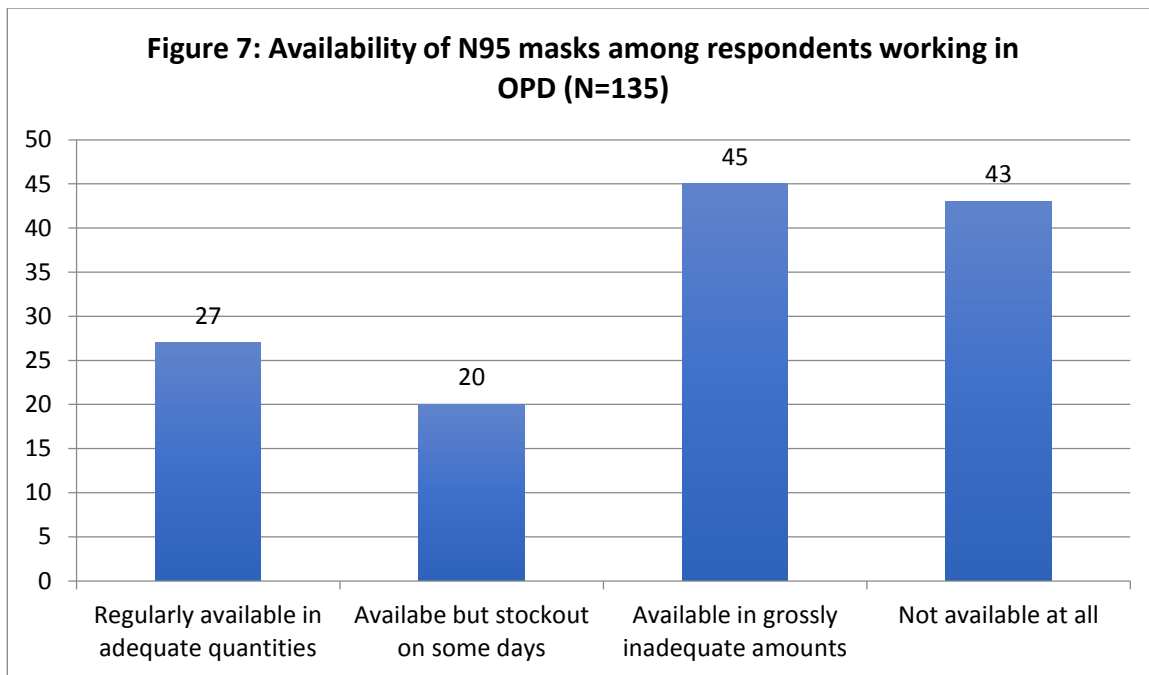
On looking at whether receiving any training had any effect on knowledge of PPE recommendations, it was found that, among the 171 that reported that they had received training, only 7.56% had appropriate knowledge of the recommended PPE as per their area of work, raising concerns on the effectiveness of the training (Table 2).

Table 2: Effect of receiving training on knowledge regarding PPE

Training Received?	<i>Appropriate knowledge of PPE</i>	<i>Inappropriate Knowledge of PPE</i>	<i>Unable to determine</i>	<i>TOTAL</i>
Yes	23	190	8	221
No	12	155	4	171
<i>Total</i>	35	345	12	392

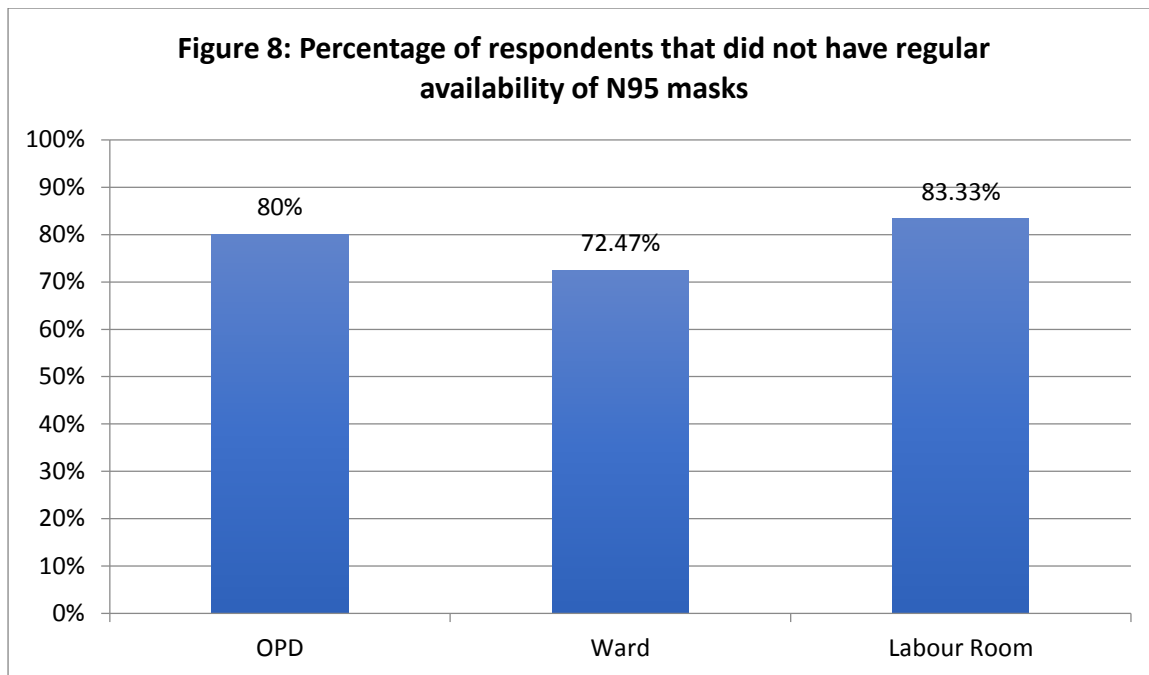
Availability of PPE

Participants were asked to report on whether different components of PPE had been regularly available in their work area over the previous one week. **The survey found different components of PPE recommended for different areas were not regularly available in adequate quantities in most health care settings.** Among the 135 respondents working in OPD, 43(31.85%) reported that N95 masks, a key requirement recommended for such a setting, were not available at all; only 27(20%) reported that they were regularly available in adequate quantities. (Table A20)



Of the 76 respondents who worked in wards, only 21 (27.63%) reported that N95 masks were regularly available to them (Table A21, Figure 8). The situation in labour rooms seemed worse - among the 24 respondents working in labour rooms, only four (16.67%) said that N95 masks were regularly available in adequate quantities (Table A22, Figure 8). In order to maintain anonymity of respondents, no information regarding the identity of the facility in which the respondent worked in was collected. However, based on the districts they work in, it was found that the 20 respondents who reported that N95 masks were not regularly available in labour rooms belonged to at least 15 different districts, thus precluding the possibility that these respondents were all from and reporting about only one or two facilities.

The situation in public sector facilities was not different from the overall situation. Amongst the 229 respondents working in public sector workplaces, 85 reported working in OPDs - only 18% (16) of these reported that they had regular availability of N95 masks. Almost one third reported that N95 masks were not available at all (Table A44). Of the 65 respondents that work in wards, only 17 (26.15%) reported that N95 masks were regularly available. (Table A45).



Availability of gloves, another key PPE requirement recommended for both OPD and ward settings seemed to be better - 79(58.52%) of those working in OPD and 53(69.74%) of those working in wards reported that gloves were regularly available in adequate amounts. (Table A23, A24)

Faceshields are a key requirement for those working in labour rooms and OTs. Only 7(29.17%) of those working in labour rooms reported that face shields were regularly available in adequate quantities; 10(41.67%) reported that face shields were not available at all (Table A25)

Among the 20 respondents working in OTs, only 11 (55%) said that face shields were regularly available in adequate quantities, and 4(20%) reported that face shields were not available at all. (Table A26) Goggles are an additional requirement recommended for OTs. 5(25%) reported that goggles were not available at all; only 10 (55%) said that they were regularly available in adequate quantities.

A full complement of PPE is recommended for those working in ICU settings. Amongst 8 persons who reported working in ICU settings, only 4 reported regular availability of N95 masks in adequate quantities, 5 reported regular availability of gowns/coveralls and 4 reported regular availability of goggles and face shields. The small number of respondents from these areas – labour rooms, ICUs and OTs – preclude the possibility of generalizing to a larger population.

MoHFW guidelines recommend surgical masks and gloves for those working in the community. Of the 68 respondents who reported that they worked in the community, only 25% had a regular availability of surgical masks, and 15(22%) did not have surgical masks available at all (Table A27). In case of gloves, 22(32.35%) had regular availability in adequate quantities, 17(25%) reported that gloves were not available at all (Table A28).

It is crucial to note that **among respondents working in districts marked as Red Zones, over one in five (21.7%, 46 of 212) reported that N95 masks were not available to them**; only 29.72%(63) had a regular availability of N95 masks. (Table A29) Even among those working in OPDs in red zone districts (66), only 21.21% (14) had N95 masks regularly available in adequate quantities.(Table 30) Amongst those working in designated COVID centres, just over a third (68 of 183, 37.16%) responded that N95 masks were regularly available in adequate quantities (Table A31).

Respondents were asked where they received their PPE from. Of the 392 respondents, 64 (16.33%) did not know the source of the PPE they had received. Of the rest who reported on the source of PPE, 161(41.07%) reported that they received their PPE from the government sources, and another 62(15.82%) had received PPE from multiple sources one of which was the government, i.e. **a total of a little over half of all respondents received PPE from government sources**. 39(9.95%) had to purchase PPE themselves and 17(4.34%) got PPE as donations from NGOs (Table A32). The situation was similar even within red zone districts - the source of PPE was the government in 41.94% respondents, with another 17(10.97%) getting PPE from multiple sources including the government. **It is concerning that amongst health care workers working in red zone districts, 22 (14.19%) had to purchase PPE themselves** (Table A33).

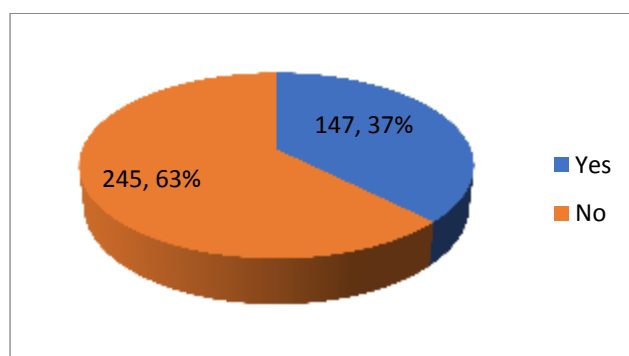
A fifth of all respondents (80 of 392, 20.41%) reported having made some innovations in the use of PPE (Table A34). These included self-made face shields, in-house production of PPE in some facilities, use of raincoats, and self-made cloth masks amongst community health workers.

Disposal and reuse

A large majority of respondents (297 of 392, 75.77%) reported that PPE is disposed off in colour coded bio-medical waste bins. 44(11.22%) reported that there is no disposal mechanism for PPE at their workplace (Table A35).

When asked about reuse, **over a third of all respondents (147 of 392, 37.5%) reported that they reuse PPE** (Figure 9). Several respondents reported that N95 masks were in short supply, and therefore they reused the same mask for 4-5 days at a time. Of concern was the fact that while a few reported that the masks were disinfected before reuse, most reported that they reused without disinfection. Some reused after air drying or drying in sunlight (Table A36).

Figure 9: Reuse of PPE



Fears, concerns and difficulties

Respondents were asked to grade their confidence in the protective capacity of the PPE they used on a scale of 1 to 5, with 1 being least protective and 5 most protective. **About a quarter (23.7%) of all respondents graded their confidence levels as 1 or 2, while 40.3% of respondents graded it 4 or 5** (Table A37).

Over a third of all respondents (138 of 392, 35.2%) reported that they had fears/concerns regarding PPE usage (Table A38). The most common fears were related to their own/their family's personal safety from infection, concerns regarding quality of PPE provided to them, that the PPE was inadequate, or that they would run out of PPE in the near future. Some also expressed concerns about difficulties in using PPE and whether they were donning and doffing it properly.

40.31% (158 respondents) of the total respondents reported that PPE of appropriate size was not available for use (Table A39). Even within red zone districts, 87(41.04%) responded that they did not get PPE of appropriate size (Table A40). **Close to a half of all respondents (180 of 392, 45.92%) reported facing practical difficulties during working with PPE** (Table 41). These included sweating profusely, feeling hot, suffocated and dehydrated with long use of PPE, difficulties in performing medical procedures due to loss of dexterity, visual and auditory difficulties leading to difficulties in writing, auscultation or performing procedures, and practical difficulties like inability to eat, drink or use washrooms.

Over a third of all respondents (146 of 392, 37.24%) felt that there was discrimination in the process of distribution of PPE (Table 42). Of these, 56(38.36%) were doctors, 47 (32.19%) were medical students (postgraduate residents and interns), 7 (4.79%) were Community Health Workers, and 9 (6.16%) were nurses. Most of such perceived discrimination was related to PPE being distributed only to certain cadres hierarchically (e.g. doctors as opposed to nurses, senior doctors as opposed to interns), or to only certain departments in a facility being provided PPE while others were not (Table A43).

Conclusions

To our knowledge, this is the first systematic study to understand availability of PPE amongst health care workers in India. The study had respondents from 26 states across the country and reports the status of PPE between 6th and 18th May, 2020. While the online methodology of the study and small sample size are limitations, the study indicates important gaps in the situation regarding PPE in the country.

The study highlights that almost all components of PPE are either inadequately available or not available at all in most health care settings. Even in Red Zone districts and designated COVID centres, where health care workers face a high burden of patients with COVID infection or potentially infected patients, the availability of N95 mask, a respirator that is a key part of the full complement PPE and even recommended for settings like OPD, is grossly inadequate. Similarly, other key PPE components like face shields, goggles and gowns were not regularly available in settings where they were recommended. Community level health workers who were engaged in contact tracing and door to door surveys also

reported unavailability of surgical masks that were recommended for their level. CHWs reported that they were predominantly dependant on reusable cloth masks, or reuse of disposable surgical masks after washing and sun drying.

The lack of adequate availability of PPE seemed to have other consequences too. **A significant proportion of health care workers reported purchasing their own PPE or receiving it in the form of donations from NGOs. Healthcare workers reported reusing their PPE, often without adequate disinfection practices recommended before reuse.** It is noteworthy that WHO classifies extended use of PPE or reuse of PPE as “**last-resort temporary measures** in crisis situations to be adopted **only** where there might be serious shortages of PPE or in areas where PPE may not be available.” Even then, it cautions that “the reuse of any item without a reprocessing/decontamination process is considered inadequate and unsafe.” Amongst the study respondents however, **extended use of PPE seemed to be the usual practice**, with almost every other healthcare worker reporting experiencing practical difficulties while working with PPE, ranging from sweating and dehydration to suffocation, and going without food or water or restroom breaks for the entire duration of using PPE.

Another area of emerging concern is that of **poor knowledge regarding appropriate PPE.** Over half of the respondents reported that they have not received any training regarding use of PPE, with one in five reporting that they were either self-taught or taught by peers and colleagues informally. This, along with the poor status of knowledge about appropriate PPE recommendations among healthcare workers, indicates that the health workforce is not being trained adequately in the use of PPE.

All of these seemed to have a definite impact on health worker morale. **A significant proportion of the health workforce is under fear or experiences concerns regarding use of PPE, its protective capacity, the risk of exposure to infection, and spreading it to their family members.**

The rising numbers of health care worker infections reported in the media[13] highlight the possible disastrous consequences of the gaps highlighted above. Policy and programmes need to address these gaps immediately to protect health workers who are working at the frontline of the COVID-19 pandemic.

Recommendations

The researchers recommend the following actions by policy and programme makers to address gaps in PPE in the country.

1. *Ensure adequate availability of PPE*

The government must **make available adequate PPE as per its guidelines** at all health facilities in the public sector and bring regulations to ensure that healthcare workers in the private sector health facilities have access to appropriate PPE. With rising numbers of infections across the country and the possible spread of COVID-19 to areas beyond hotspots or containment zones, and the fact that a large majority of infections are asymptomatic, it is also necessary to ensure such availability in ALL

health facilities, including those at lower level and in non-hotspot areas, and in various health care settings, including at community level. The process of **distribution of PPE must be transparent** such that all healthcare workers receive appropriate PPE irrespective of the hierarchy of their cadre. Use **of tools such as PPE burn rate calculator applications** may be considered to assist calculating need and optimize rational use of PPE at institutional level[14].

2. Ensure training on PPE

Adequate training must be provided to all health care workers regarding PPE recommendations, its use, disposal, and reuse. This will help alleviate the fear of the health workforce and increase their confidence in the PPE provided to them. It will also help decrease healthcare worker infections due to incorrect use, reuse and disposal of PPE.

3. Addressing fears and concerns of health care workers

The training of healthcare workers must seek to address their fears and concerns. **The adequate availability of PPE along with suitable training on use** will help alleviate at least some of these fears. **A grievance redress mechanism that includes an immediate response component** needs to be set up for health care workers experiencing any difficulties in their work while managing patients with COVID. In addition, health care workers also need **adequate mental health support** to help them deal with fear, concerns, isolation and burnout they may be experiencing. This may be in the form of widely publicised mental health helplines, periodic institute level group therapy sessions, considerate work schedules, and “buddy” system of pairing healthcare workers together.[15]

4. The need for systematic studies regarding situation of PPE in the country

There is a dearth of nationwide studies regarding availability and use of PPE in India. In the situation of rising healthcare worker infection, it is required to assess the situation more thoroughly in terms of both quantity and quality of PPE at regular intervals through research studies that are transparent and properly reported. There have also been many modifications and innovations regarding PPE at some institutions and individual levels. There must be an attempt to standardize these innovations and scale up those that are found to have proven efficacy.

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ANNEXURES

Annexure 1: State level reports

Maharashtra

There were a total of 100 respondents that worked in Maharashtra, hailing from 20 districts across the state. The majority were from Mumbai (33). Of these, 49 were male, and 51 were female. Among the 100 respondents, 44 were doctors, 40 were medical students (postgraduate residents and interns), 7 were nurses, 2 were Community Health Workers, and 3 were dentists.

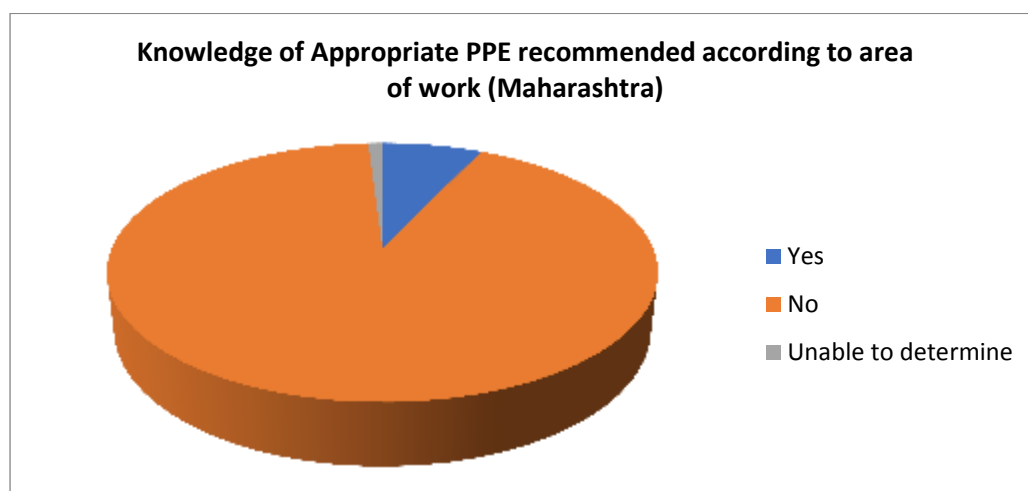
42 of these were working at the tertiary level, 17 at the primary level, and 12 at the secondary level. 13 worked at centres that cannot be classified as any of the above including community based work. 16 respondents worked at multiple levels.

In terms of area of work, 41 worked in the OPD, 30 worked in wards, 7 worked in Labour room and 4 in OT, 1 worked in counselling patients and relatives, 3 in record keeping, 3 were involved in community work, and 11 were involved in more than one such area of work.

Of these, 51 worked in designated COVID centres. 73 worked in Red zone districts, 13 in Orange zone districts, 14 in Green Zones.

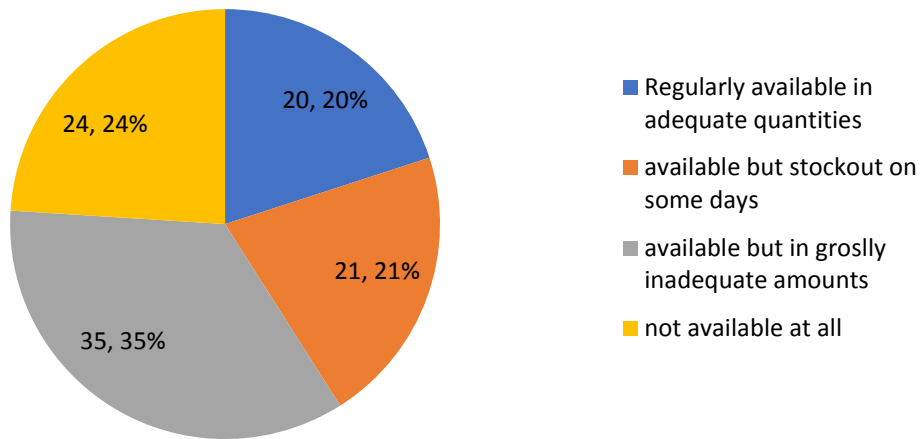
Only half of the respondents from the state (49%) reported that they received training regarding use of PPE. Of those that did receive training (49), 26 got training from government sources, and 9 from more than one source, one of which is the government, and 10 from multiple sources none of which is the government.

Concerningly, a very small proportion (7) had knowledge regarding appropriate PPE for their workplace; a large majority (92) did not. (For one respondent, the appropriate PPE recommendation could not be determined due to lack of clarity regarding area of work.)



Of the 100 respondents from Maharashtra, only 20 reported that they had regular availability of N95 masks.

Availability of N95 among respondents from Maharashtra (N=100)

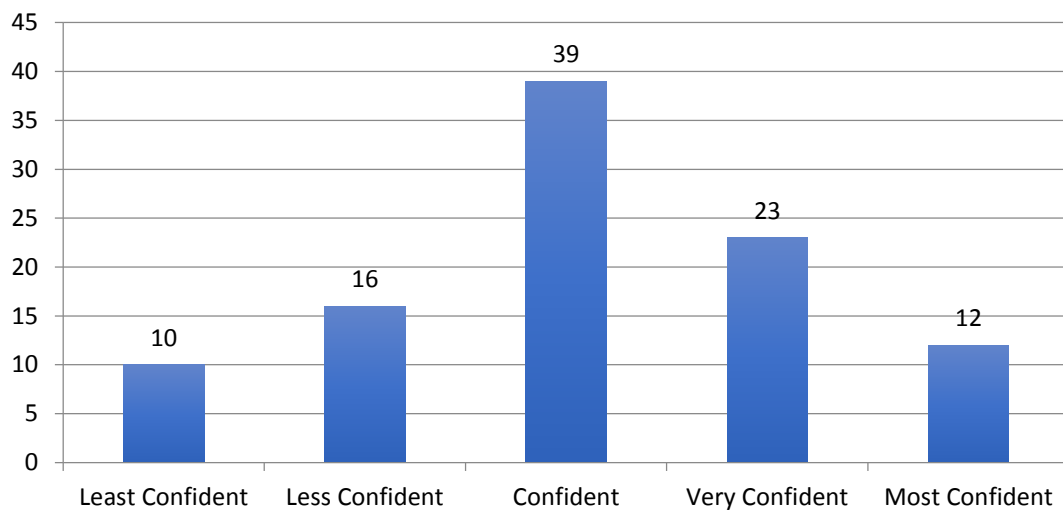


Only about half of all respondents from the state reported receiving PPE from the government - 38% from the government, and 14(14%) from multiple sources including the government.

Almost half 43(43%) reported that they did not get PPE of appropriate size.

When asked about confidence regarding protective capacity of PPE, 39 rated 3 out of 5.

Level of Confidence in protective capacity of PPE (Maharashtra)



Almost half (44%) reported that they faced practical difficulties while working with PPE and over a quarter (28%) reported that they had some fear/concerns regarding use of PPE.

When asked if they felt that there was discrimination in the process of distribution of PPE, 43% (43) said yes. A third of respondents (34%) respondents reported that they reuse the PPE provided to them.

Tamil Nadu

There were a total of 58 respondents that worked in Tamil Nadu. Of these, 32 (55.17%) were male, and 26 (44.83%) were female. Among the 58 respondents, 26(44.83%) were doctors, 21(36.21%) were medical students (postgraduate residents and interns), 2 (3.45%) were nurses, 2 (3.45%) were Public health professionals, and 3 (5.17%) were technicians.

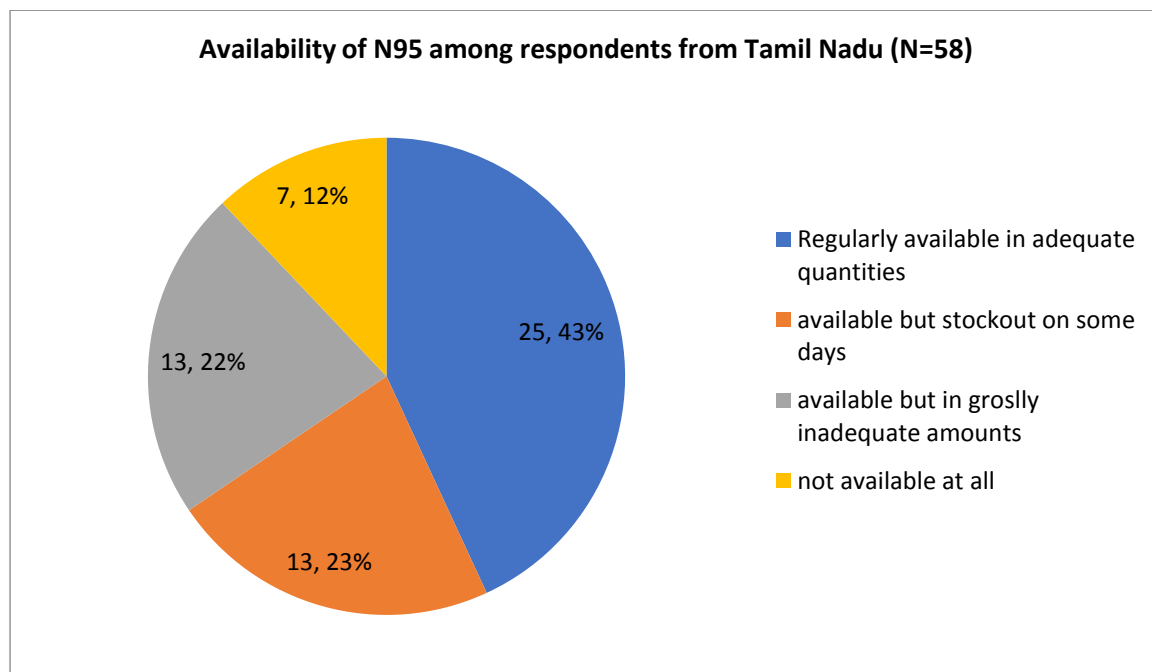
43 (74.14%) classified their workplace as public sector. Of the rest, 5 (8.62%) reported as working in private for profit sector, 7 (12.07%) in private not for profit sector and 3(5.17%) in community based work.

In terms of area of work, 19(32.76%) worked in the OPD, 17(29.31%) worked in wards, 3(5.17%) worked in Labour room and 4(6.9%) in OT, 3(5.17%) worked in counselling patients and relatives, 1(1.72%) in record keeping, 2(3.45%) were involved in community work, and 9(15.52%) were involved in more than one such area of work.

Of these, 38(65.52%) worked in designated COVID centres. 35(60.34%) worked in Red zone districts, 23(39.66%) in Orange zone districts.

Two thirds of respondents from the state (63.79%) reported that they did not receive any training on use of PPE. Only eight (13.79%) respondents had knowledge regarding appropriate PPE for their workplace, an overwhelming majority of 49(84.48%) did not. Of those that did receive training, ten (17.24%) got training from Government sources, and another 4(6.9%) from more than one source one of which is the government. and 2(3.45%) from multiple sources none of which is the government.

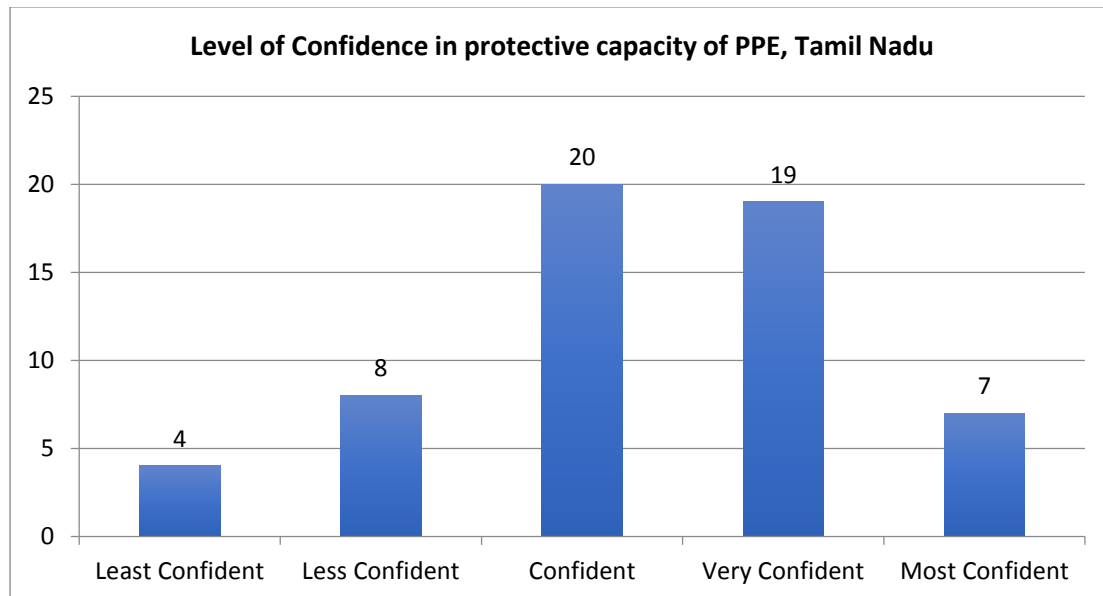
Of the 58 respondents from Tamil Nadu, 25(43.1%) reported that they have regular availability of N95 masks.



For 53.45% (31) respondents, the source of their PPE was the government, 5 (8.62%) received PPE from private hospital authorities, 3 (5.17%) had to purchase PPE themselves, 1 (1.72%) received PPE as donations from NGOs, 9 (15.52%) got PPE from multiple sources

including the government. The availability of appropriate size PPE was one of the questions to which 23 (39.66%) responded that they did not get PPE of appropriate size.

When asked about confidence regarding protective capacity of PPE, 20(34.48%) rated 3 out of 5.



29% (44) reported that they faced practical difficulties while working with PPE. 25.86% (15) reported that they had some fear/concerns regarding use of PPE.

When asked if they felt that there was discrimination in the process of distribution of PPE, 43.1% (25) said yes.

Almost a third (18, 31.03%) respondents reported that they reuse the PPE provided to them.

Madhya Pradesh

There were a total of 44 respondents that worked in Madhya Pradesh. Of these, 16 (36.36%) were male, and 27 (61.36%) were female. Among the 44 respondents, 7 (15.91%) were doctors, 13 (29.55%) were medical students (postgraduate residents and interns), 11(25%) were Community Health Workers, 1 (2.27%) were Public health professionals, and 1 (2.27%) was a technician, 11 (25%) were others.

29.55% (13) of these were working at the tertiary level, 11.36% (5) at the primary level, 13.64% (6) at the secondary level. 34.09% (15) worked at centres that cannot be classified as any of the above including community based work. 5 respondents worked at multiple levels.

Of these, 18 (40.91%) worked in designated COVID centres. 23 (52.27%) worked in Red zone districts, 16 (36.36%) in Orange zone districts.

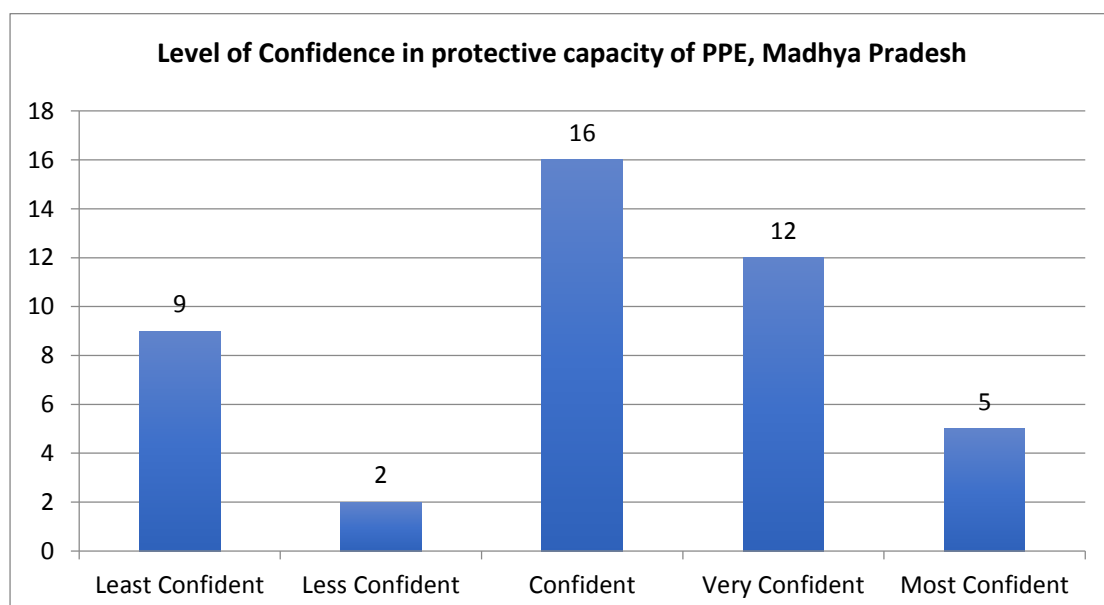
Of the 44 respondents from Madhya Pradesh, only 9 respondents reported regular availability of N95 masks.

Three-fourths of respondents from the state (75%) reported that they did not receive any training on use of PPE. Only two (4.55%) respondents had knowledge regarding appropriate

PPE for their workplace, an overwhelming majority of 39(88.64%) did not. (For three respondents, the appropriate PPE recommendation could not be determined due to lack of clarity regarding area of work). Of those that did receive training, seven (15.91%) got training from Government sources, and another 3 (6.9%) from more than one source one of which is the government.

For 47.73% (21) respondents, the source of their PPE was the government, 1 (2.27%) received PPE from private hospital authorities, 5 (11.36%) had to purchase PPE themselves, 12 (27.27%) got PPE from multiple sources including the government. The availability of appropriate size PPE was one of the questions to which 22 (50%) responded that they did not get PPE of appropriate size.

When asked about confidence regarding protective capacity of PPE, 16 (36.36%) rated 3 out of 5.



50% (22) reported that they faced practical difficulties while working with PPE. 56.82% (25) reported that they had some fear/concerns regarding use of PPE.

When asked if they felt that there was discrimination in the process of distribution of PPE, 45.45% (20) said yes.

Half (22, 50%) of respondents reported that they reuse the PPE provided to them.

Annexure 2: Tables

Table A1: Distribution of respondents by age

N= 388		
Respondents Age	No. of Cases	%
20-29 years	182	46.91
30-39years	128	32.99
40-49 years	56	14.43
50-59 years	18	4.64
60-69 years	4	1.03
Mean age	42.2 years	

Table A2: Distribution of respondents by gender

N= 392		
Respondents gender	No. of Cases	%
Male	209	53.32
Female	182	46.43
Other	0	0
Prefer not to say	1	0.26
Total	392	100.00

Table A3: Distribution of respondents by Level of care

N= 392		
Level Of Care	Frequency	%
Multiple	41	10.46%
other	69	17.60%
Primary	60	15.31%
Secondary	80	20.41%
Tertiary	142	36.22%
Total	392	100.00%

Table A4: Distribution of respondents by area of work

N= 392		
Respondents by area of work	No. of Cases	%
OPD	135	34.44
Ward	76	19.39
Labour room	24	6.12
OT	20	5.10
Counselling of patients and relatives	7	1.79
Record keeping	7	1.79
Community work	50	12.76
Any Other	73	18.62
Total	392	100.00

Table A5: Distribution of respondents by most of the time working in what kind of the work place

N=		392
Respondents by work place	No of cases	%
Public sector hospital	229	58.42
Private sector for profit hospital/ health centre	50	12.76
Private sector not for profit hospital/ health centre	45	11.48
Community/field level work	68	17.35
Total	392	100.00

Table A6: Distribution of Doctors by designation

N=		155
Designation of Doctor	Frequency	%
Specialist	71	45.82%
Medical officer(MBBS)	79	50.96%
Medical officer(AYUSH)	5	3.22%
Total	155	100.00%

Table A7: Distribution of respondents by the state where their workplace is located

N=		392
Respondents by their State	No. of Cases	%
Andhra Pradesh	7	1.79
Assam	3	0.77
Bihar	13	3.32
Chandigarh	3	0.77
Chhattisgarh	23	5.87
Goa	2	0.51
Gujrat	6	1.53
Himachal Pradesh	21	5.36
Jharkhand	6	1.53
Karnataka	23	5.87
Kerala	7	1.79
Madhya Pradesh	45	11.49
Maharashtra	100	25.51
Manipur	1	0.26
Meghalaya	1	0.26
New Delhi	16	4.08
Odisha	6	1.53
Puducherry	3	0.77
Panjab	1	0.26
Rajasthan	8	2.04
Tamil Nadu	58	14.08
Telangana	5	1.28
Tripura	1	0.26
Uttar Pradesh	21	5.36
Uttarakhand	9	2.30
West Bengal	3	0.77
Total	392	100.00

Table A8: Distribution of respondents by Colour coding of the district as per the date of Response

N=		392
Respondents by colour coding of the district as per the date of Response	No of cases	%
Red	212	54.08
Orange	98	25.00
Green	81	20.66
Unable to determine	1	0.26
Total	392	100.00

Table A9: Distribution of respondents by their work in designated COVID centre

N =		392
Work in designated COVID centre	No. of Cases	%
No	209	53.32
Yes	183	46.68

Table A10: Distribution of doctors by their work in designated COVID center

N=		155
Doctor working in Designated COVID center	Frequency	%
No	88	56.77%
Yes	67	43.23%
Total	155	100%

Table A11: Distribution of doctors by the colour code of the district they work in

N=		155
Colour code of District	Frequency	%
Red	75	48.39%
Orange	41	26.45%
Green	39	25.16%
Total	155	100%

Table A12: Distribution of respondents by whether or not they received training

N=		392
Training received?	Frequency	%
No	221	56.12%
Yes	171	43.88%
Total	392	100%

Table A13: Distribution of respondents based on source of training

N=		392
Training received from	No of Cases	%
Not applicable/ not received any training	221	56.12
Public health system	78	19.9
Private hospital authorities	25	6.38
NGO	5	1.28
Multiple Sources of training including government	34	8.67
Multiple Sources of training did not include government	29	7.4
Total	392	100.00

Table A14: Distribution of respondents from Red zone according to training

N=		212
Training received?	Number	%
No	110	51.89%
Yes	102	48.11%
Total	212	100.00%

Table A15: Distribution of respondents working in Designated COVID Center according to training

N=		183
Training received?	Number	%
No	80	43.72%
Yes	103	56.28%
Total	183	100.00%

Table A16: Distribution of respondents from Tamil Nadu according to training

N=		58
Training received?	Number	%
No	37	63.79%
Yes	21	36.21%
Total	58	100.00%

Table A17: Distribution of respondents based on knowledge of appropriate PPE recommendations

N=		392
Knowledge of Appropriate PPE?	Number of respondents	%
Yes	35	8.93%
No	345	88.01%
Unable to determine	12	3.06%
Total	392	100%

Table A18: Distribution of respondents from Red Zone districts based on knowledge of appropriate PPE recommendations

N=		212
Knowledge of Appropriate PPE?	Number of respondents	%
Yes	15	7.08%
No	190	89.62%
Unable to determine	7	3.3%
Total	212	100%

Table A19: Distribution of respondents from designated COVID center based on knowledge of appropriate PPE recommendations

N=		183
Knowledge of Appropriate PPE?	Number of respondents	%
Yes	17	9.29%
No	163	89.07%
Unable to determine	3	1.64%
Total	183	100%

Table A20: Distribution of respondents working in OPD by availability of N95 masks

N=		135
N95 mask	Number	%
Regularly available in adequate quantities	27	20.00%
Available but stock out on some days	20	14.81%
Available but in grossly inadequate amounts	45	33.33%
Not available at all	43	31.85%
Total	135	100.00%

Table A21: Distribution of respondents working in wards by availability of N95 masks

N=		76
N95 mask	Number	%
Regularly available in adequate quantities	21	27.63%
Available but stock out on some days	19	25%
Available but in grossly inadequate amounts	30	39.47%
Not available at all	6	7.89%
Total	76	100.00%

Table A22: Distribution of respondents working in Labour rooms by availability of N95 masks

N=		24
N95 mask	Number	%
Regularly available in adequate quantities	4	16.67%
Available but stock out on some days	2	8.33%
Available but in grossly inadequate amounts	16	66.67%
Not available at all	2	8.33%
Total	24	100.00%

Table A23: Distribution of respondents working in OPD by availability of gloves

N=		135
Gloves	Number	%
Regularly available in adequate quantities	79	58.52%
Available but stock out on some days	24	17.78%
Available but in grossly inadequate amounts	27	20%
Not available at all	5	3.7%
Total	135	100.00%

Table A24: Distribution of respondents working in wards by availability of gloves

N=		76
Gloves	Number	%
Regularly available in adequate quantities	21	27.63%
Available but stock out on some days	19	25%
Available but in grossly inadequate amounts	30	39.47%
Not available at all	6	7.89%
Total	76	100.00%

Table A25: Distribution of respondents working in labour rooms by availability of face shield

N=		24
Face shield	Number	%
Regularly available in adequate quantities	7	29.17%
Available but stock out on some days	2	8.33%
Available but in grossly inadequate amounts	5	20.83%
Not available at all	10	41.67%
Total	24	100.00%

Table A26: Distribution of respondents working in OTs by availability of face shield

N=		20
Face shield	Number	%
Regularly available in adequate quantities	11	55%
Available but stock out on some days	2	10%
Available but in grossly inadequate amounts	3	15%
Not available at all	4	20%
Total	20	100.00%

Table A27: Distribution of respondents working in community by availability of surgical masks

N=		68
Surgical masks	Number	%
Regularly available in adequate quantities	17	25%
Available but stock out on some days	15	22.06%
Available but in grossly inadequate amounts	21	30.88%
Not available at all	15	22.06%
Total	68	100.00%

Table A28: Distribution of respondents working in community by availability of gloves

N=		68
Face shield	Number	%
Regularly available in adequate quantities	22	32.35%
Available but stock out on some days	10	14.71%
Available but in grossly inadequate amounts	19	27.94%
Not available at all	17	25%
Total	68	100.00%

Table A29: Distribution of respondents working in Red Zone districts by availability of N95 masks

N=		212
Face shield	Number	%
Regularly available in adequate quantities	63	29.72%
Available but stock out on some days	41	19.34%
Available but in grossly inadequate amounts	62	29.25%
Not available at all	46	21.7%
Total	212	100.00%

Table A30: Distribution of respondents working in OPDs within Red Zone districts by availability of N95 masks

N=		66
N95 mask	Number	%
Regularly available in adequate quantities	14	21.21%
Available but stock out on some days	12	18.18%
Available but in grossly inadequate amounts	26	39.39%
Not available at all	14	21.21%
Total	66	100.00%

Table A31: Distribution of respondents working in designated COVID centres by availability of N95 masks

N=		183
N95 mask	Number	%
Regularly available in adequate quantities	68	37.16%
Available but stock out on some days	35	19.13%
Available but in grossly inadequate amounts	59	32.24%
Not available at all	21	11.48%
Total	183	100.00%

Table A32: Distribution of respondents by the source of supply of PPE

N=			392
Source of supply of PPE	No of cases	%	
Government supply	161	41.07	
Purchased by private hospital	38	9.69	
Purchased by you for yourself	39	9.95	
Donated by NGO	17	4.34	
Don't know	64	16.33	
Multiple sources including government supply	62	15.82	
Multiple sources that did not include government	11	2.81	
Total	392	100.00	

Table A33: Distribution of respondents in Red Zone districts by the source of supply of PPE

N=			212
Source of supply of PPE	No of cases	%	
Government supply	75	35.38	
Purchased by private hospital	26	12.26	
Purchased by you for yourself	20	9.43	
Donated by NGO	9	4.25	
Don't know	37	17.45	
Multiple sources including government supply	37	17.45	
Multiple sources that did not include government	8	3.77	
Total	212	100.00	

Table A34: Distribution of respondents by whether or not they made innovations regarding use of PPE

N=		392
Made innovations regarding PPE?	Number	%
No	130	33.16
Yes	80	20.41
Did not respond	182	46.43
Total	392	100%

Table A35: Distribution of respondents by mode of disposal of PPE

N=		392
Mode of disposal of PPE	Number	%
Using color coded bins	297	75.77
In general garbage	24	6.12
No disposal mechanism	44	11.22
Other	27	6.89
Total	392	100%

Table A36: Distribution of respondents by whether or not they reuse PPE

N=		392
Reuse PPE?	Number	%
No	245	62.5
Yes	147	37.5
Total	392	100

Table A37: Distribution of respondents by confidence in protective capacity of PPE

N=		392
Confidence in protective capacity of PPE (Out of 5)	Number	%
1	36	9.18
2	57	14.54
3	141	35.97
4	118	30.1
5	40	10.2
Total	392	100

Table A38: Distribution of respondents by whether or not they had any fear/concern regarding PPE

N=		392
Fear/Concern regarding PPE?	Number	%
No	134	34.18
Yes	138	35.2
Did not respond	120	30.61
Total	392	100

Table A39: Distribution of respondents based on whether PPE of appropriate size was available to them

N=		392
Availability of PPE of appropriate size?	Number	%
No	158	40.31
Yes	234	59.69
Total	392	100

Table A40: Distribution of respondents of Red Zone districts based on whether PPE of appropriate size was available to them

N=		212
Availability of PPE of appropriate size?	Number	%
No	87	41.04
Yes	125	58.96
Total	212	100

Table A41: Distribution of respondents based on whether they experienced practical difficulties while working with PPE

N=		392
Experience practical difficulties during work with PPE?	Number	%
No	212	54.08
Yes	180	45.92
Total	392	100

Table A42: Distribution of respondents based on whether they perceived discrimination in the process of distribution of PPE

N=		392
Perceive discrimination in distribution of PPE?	Number	%
No	246	62.76
Yes	146	37.24
Total	392	100

Table A43: Distribution of respondents that perceived discrimination in the process of distribution of PPE by designation

N=		146
Designation	Number	%
Admin staff	2	1.37
CHW	7	4.79
Dentist	2	1.37
Doctor	56	38.36
Medical student	47	32.19
Nurse	9	6.16
Public Health professional	5	3.42
Technician	5	3.42
Other	13	8.9
Total	146	100

Table A44: Distribution of respondents working in OPDs in Public sector workplaces by availability of N95 masks

N=		85
N95 mask	Number	%
Regularly available in adequate quantities	16	18.82%
Available but stock out on some days	10	11.76%
Available but in grossly inadequate amounts	32	37.65%
Not available at all	27	31.76%
Total	85	100.00%

Table A45: Distribution of respondents working in OPDs in public sector workplaces by availability of N95 masks

N=		65
N95 mask	Number	%
Regularly available in adequate quantities	17	26.15%
Available but stock out on some days	17	26.15%
Available but in grossly inadequate amounts	26	40%
Not available at all	5	7.69%
Total	65	100.00%