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Consolidated Impact Assessment Report for Honeywell Entities on behalf of their implementing agency Honeywell Hometown Solutions India Foundation

Project Name: COVID-19 Pandemic Relief Support

Prepared By



Prepared for

Honeywell

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We design, monitor and evaluate social & environmental impact for CSR, government, philanthropic foundations, research think-tanks and NGOs in an efficient, transparent and inclusive way.



List of Abbreviations

CC	COVID Care Center
CCC	COVID Critical Care Center
HHSIF	Honeywell Hometown Solutions India Foundation
IDI	In- Depth Interview
KII	Key Informant Interview
LPM	Liquid Per Minute
OGP	Oxygen Generation Plant
PHC	Public Health Center
PPP	Personal Protective Equipment

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This study was conducted to assess the COVID relief efforts by Implementation partner- HHSIF Hometown Solutions India Foundation (HHSIF) in association with on-ground partners- Sustainable Environment and Ecological Development Society (SEEDS) and Americares India Foundation, across various parts of India.

Methodology

The research employed qualitative research to gain deeper insights into the activities, outputs, and outcomes of an intervention. In-depth interviews were conducted with Hospital staff (who have worked in COVID Care Centers & COVID Critical Care Centers), the personnel in charge of Oxygen Generation Plants, and personnel from the Implementation Team.

Findings

The major interventions undertaken by the HHSIF during the COVID-19 pandemic can be categorized into two main areas: providing infrastructural aid for COVID-19 patient care and implementing measures to alleviate oxygen shortage.

Infrastructural aid to COVID-19 patient care:

- HHSIF supplied 10,000 N95 respirators, and 4,500 personal protective equipment (PPE) kits, and established 2 COVID Critical Care Centers (CCCs) and 10 COVID Care Centers (CCs).
- These interventions were highly beneficial, with the facilities being utilized 50% to 60% of the time.
- Materials provided as part of the intervention are still in use, with CCC materials being repurposed to expand ICU facilities in hospitals and CC materials repurposed to remote Primary Health Centers (PHCs). Special mention has been made to the usefulness of portable X-ray machines and Laryngoscopy equipment in day to day functioning of the health facility
- HHSIF's attention to detail, quick decision-making, and provision of high-quality materials were commended by stakeholders.



Measures to alleviate oxygen shortage:

- Honeywell donated around 1000 oxygen concentrators across the country and established 10 Oxygen Generation Plants (OGPs) across 4 states in India.
- Oxygen concentrators were provided promptly, and stakeholders expressed satisfaction with their quality, with the oxygen concentrator still being used in the daily functioning of the facility.
- Setting up OGPs was challenging, but site visits by the Americare Foundation ensured proper functioning and detailed training and maintenance activities were conducted during the initial year.
- While setting up OGPs took around 6 months, they were established towards the end of the COVID wave, limiting their current impact but positioning them as valuable assets for future pandemic preparedness.

Conclusion

The study reveals significant positivity among stakeholders regarding their association with the HHSIF. Stakeholders appreciated the quality of materials provided by HHSIF and the prompt decision-making process. The high-quality materials received from HHSIF have contributed to their continued use beyond the COVID-19 pandemic, ensuring long-term impact.

However, the only area of concern mentioned was the delay in setting up the Oxygen Generation Plants (OGPs) in some facilities, attributed to on-ground challenges during the peak of the second COVID-19 wave. Despite this delay, stakeholders unanimously testified that OGPs would be invaluable during future pandemics in preventing acute oxygen shortages at these locations.

Overall, stakeholders expressed widespread positivity about their association with Honeywell, with all expressing a desire for future collaborations with the organization.



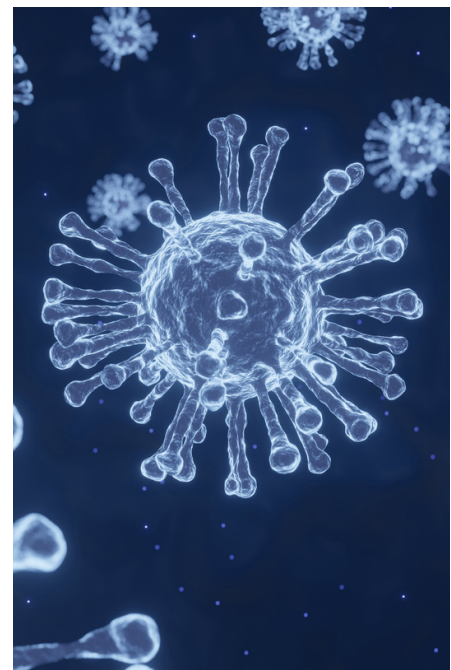
INTRODUCTION

The COVID-19 pandemic, declared by the World Health Organization (WHO) as a global pandemic (Kaushik et al., 2021), has had profound and devastating effects worldwide, including in India. With over 5.5 million deaths globally, the pandemic has caused widespread disruption to lives, economies, and societies, with developing countries particularly affected (WHO, 2022).

In India, the impact of COVID-19 has been severe, resulting in a significant loss of lives and affecting millions of people. The country has witnessed over 5,33,445 deaths and millions of cases (GOI, n.d). The pandemic's effects have varied across different waves, with the second wave, which occurred from March to May 2021, having the most devastating impact on the country's health system. This wave exposed significant challenges, including shortages of medical facilities such as oxygen beds and ICU facilities, as well as shortages of medical staff and oxygen supply. Frontline workers and crematoriums faced immense crisis, and many hospitals were overwhelmed, leading to patients being turned away (Lahoti, 2021).

To combat the onslaught of COVID-19, the Government of India adopted a multipronged approach, including leveraging Public Private Partnerships (PPP). Collaboration with communities, non-profits, and civil society organizations played a crucial role in implementing projects due to their extensive reach and volunteer bases within the community (Marwaha, 2021).

CSR initiatives like that of Honeywell's have stepped in to provide support to the government and the health system during the pandemic. Through its Honeywell Hometown Solutions India Foundation (HHSIF) (implementation agency), the Implementation Agency partnered with on-ground partners (Americares India Foundation and SEEDs Foundation) to establish COVID Care and Critical Care Centers, as well as Oxygen Generation Plants, in several states across India. Additionally, HHSIF donated essential medical equipment such as oxygen concentrators, ventilators, respirators, and PPE kits to various hospitals. The company also committed to establishing COVID care and critical care centers in multiple states to provide much-needed healthcare infrastructure during the crisis.



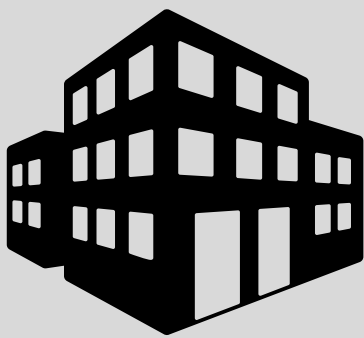


PROJECT BACKGROUND

Honeywell is a Fortune 100 technology company that delivers industry-specific solutions globally. The Honeywell Hometown Solutions India Foundation (HHSIF) is a not-for-profit organization responsible for implementing Honeywell's corporate social responsibility (CSR) endeavors in three critical areas: education, skill & research, sustainability community development, and humanitarian relief activities.

During the COVID-19 pandemic, under the scope of disaster management, COVID-19 interventions under 2 major areas. These are:

Infrastructural aid to COVID-19 patient care:



HHSIF facilitated the establishment of 20-bedded COVID-19 Care Centers (CCCs) and set up two 10-bedded COVID-19 Critical Care Centers (CCCs) across five states in India. These CCCs were equipped with essential medical equipment such as Fowler beds, class I ventilators, defibrillators, multipara monitors, X-ray machines, and BIPAP machines to effectively treat critical COVID-19 patients. The establishment of these facilities was carried out in collaboration with the on-ground partner Sustainable Environment and Ecological Development Society (SEEDS).

Sr. No.	COVID Care Centers	Locations
1	Aggarwal Dharamshala, Kirari	Delhi
2	Employees State Insurance Corporation Hospital in Bibwewadi	Maharashtra
3	Rajiv Gandhi Hospital in Yerawada, Pune.	Maharashtra
4	Bharat Bhagya Vidhaata Hospital	Gurugram
5	Rajkiya inter college, Khanshyu, Okhalkhanda.	Uttarakhand

Table 1: List of COVID Care Centers



Furthermore, HHSIF provided additional support by supplying 10 ventilators, 10,000 N95 respirators, and 4,500 personal protective equipment (PPE) kits to various hospitals across the country. This aid was instrumental in enhancing patient care and ensuring the safety of healthcare workers on the frontlines of the pandemic. HHSIF's proactive efforts in providing essential medical infrastructure and supplies significantly contributed to the effective management of COVID-19 cases in India.

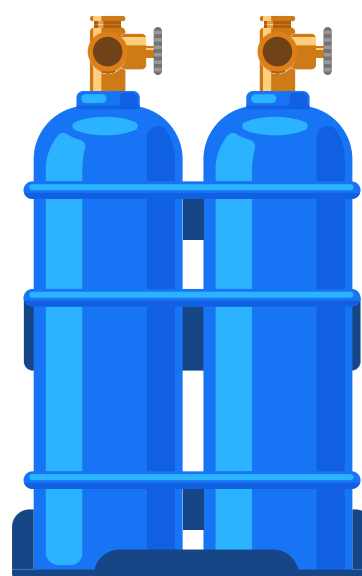
Sr. No.	COVID Critical Care Centers	Locations
1	Bowring Hospital, Shivaji Nagar- Bangalore	Karnataka
2	Jumbo Facility Hospital in Kandarpada, Dahisar West	Maharashtra

Table 2: List of COVID Critical Care Centers

Measures to address acute Oxygen shortage

During the COVID-19 pandemic, medical oxygen emerged as a critical necessity in India, with significant shortages reported nationwide (Gettleman et al., 2021). In response to this pressing need, Honeywell took proactive measures to address the shortage by donating 1000 oxygen concentrators to both government and private hospitals across the country.

Moreover, as part of their preparedness efforts for future COVID waves or other pandemics, the implementation agency established 600LPM Pressure Swing Adsorption (PSA) Oxygen plants in 10 facilities spanning 4 states in India.





Sr. No	Oxygen Generation Plant location	State
1	Sub District Hospital, Akhuj, Solapur	Maharashtra
2	Khedekar Hospital, Bopodi, Pune	Maharashtra
3	Rural Hospital, Raipatan, Ratnagiri	Maharashtra
4	Sub District Hospital, Vengurla, Sindhudurg	Maharashtra
5	Taluka Hospital, Joida , Uttara Kannada	Karnataka
6	Sub Divisional Hospital, Honnavar	Karnataka
7	Sub Divisional Hospital, Siddapur	Karnataka
8	Civil Hospital, Gharaunda, Karnal	Haryana
9	District Hospital, Uttarkashi	Uttarakhand
10	Soban Singh Jeena Base Hospital, Haldwani	Uttarakhand

Table 3: List of Oxygen Generation Plant



RESEARCH METHODOLOGY

The study aims to understand the implementation pathways of HHSIF COVID response projects and their impact and value-added on the primary stakeholders i.e. the hospitals, hospital staff, etc. The impact study would look into the value addition of the intervention, the sustainability of the intervention, and how much of the intervention could be used for future purposes

3.1 Research Objectives

The major objectives of the study are as follows:

- **Relevance:** Assess the extent to which the project objectives and strategies align with the needs of the targeted Key Performance Indicators (KPIs) and the CSR plan.
- **Effectiveness:** Evaluate outcome indicators in terms of strategic and immediate outcomes aligned with CSR objectives, while also assessing stakeholder engagement and primary stakeholder experiences without various stakeholders providing services.
- **Adequacy:** Examine the extent to which strategies are used to achieve desired outcomes and how well these outcomes address local needs in terms of a future pandemic.
- **Impact:** Measure the impact of projects on stakeholders in terms of improvements in well-being and quality of life.

3.2 Theoretical Framework

OECD- DAC Framework

OECD DAC Assessment Framework ensures a comprehensive and systematic evaluation of projects, allowing for a thorough examination of their relevance, effectiveness, efficiency, impact, and sustainability. This framework provides a structured approach to assess the outcomes and benefits of initiatives, enabling organizations to make informed decisions and improve their social and developmental efforts. By adhering to the OECD DAC Assessment Framework, organizations can enhance accountability and transparency, fostering greater credibility and trust among stakeholders.



Figure 1: OECD- DAC framework

Using this framework, following questions/indicators were adopted to assess the project using the six parameters stated in the above in the picture. These questions were further finalized after discussions with the Honeywell team.

3.3 Data Collection

A qualitative approach was chosen for data collection to gain deeper insights into the activities, outputs, and outcomes of the intervention. Qualitative methods allow for a rich understanding of complex phenomena and help in constructing a comprehensive narrative of the implementation process and its impacts. During qualitative data collection, respondents were interviewed to explore their experiences with the intervention, identify any significant changes resulting from the intervention, and assess the potential utility of the intervention for similar scenarios in the future.



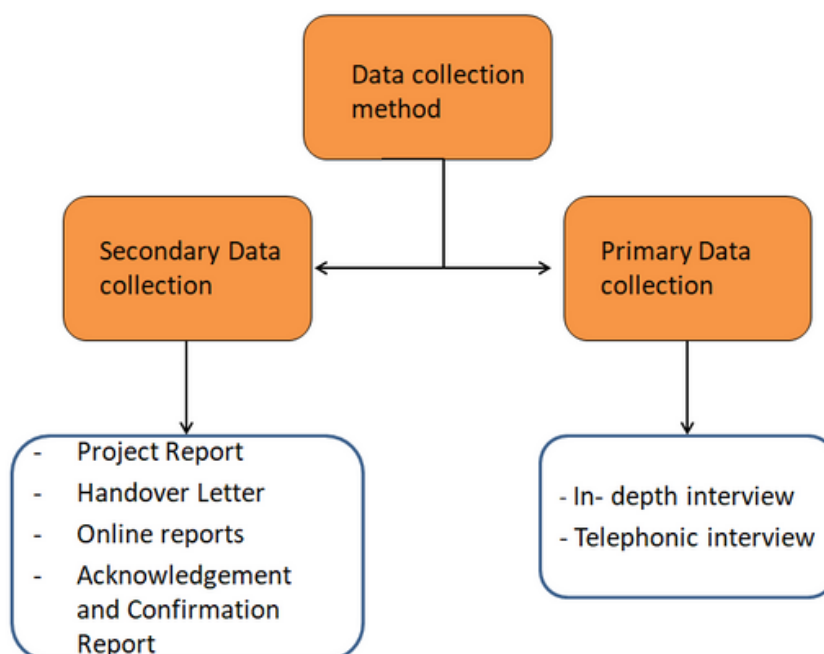


Figure 2: Data Collection Plan

Secondary Data Collection:

Secondary data collection involved reviewing various documents and materials created as part of the project. This included examining photographs, online articles related to COVID interventions, acknowledgment and handover letters provided to the organization and reports such as those from the Americares India Foundation on Oxygen Plants. These documents were analyzed to gain a deeper understanding of the implementation process, the needs assessment conducted, specifications of materials provided, and other relevant details.

Primary Data Collection:

Primary data collection primarily utilized qualitative methods. Key Informant Interviews, In-depth interviews, and telephonic interviews were conducted with various stakeholder groups, including hospital staff and the implementation team. These interviews aimed to gather detailed information on the implementation process, the value added by the intervention, the demographics of beneficiaries, and potential future applications of the intervention. Recordings of these interviews were translated and subjected to thematic analysis using software such as Atlas.ti. This analysis helped to identify key insights regarding the project's objectives, its current status, and its impact on the ground level.



3.4 Sampling

Semi-structured interview Schedules were created on a stakeholder basis to assist with data collection and in-depth interviews were conducted. Purposive sampling was utilized among all the stakeholders to ensure a comprehensive understanding of the impact of the project

Table 4: Sample Plan

SI No	Stakeholders	Location	Sample Size
1	Hospital Staff (Senior Doctors/ Medical Officers)	Gurugram- Delhi, Banglore	3 IDIs (1 each from 2 COVID Care Centers and 1 from Critical Care Centre)
2	Oxygen Generation Centre In-charge	Joida, Pune & Karnal	9 IDIs (from 3 centers)
3	On-Ground Partners	Americares India Foundation	2 IDIs
4	Implementation Team	HHSIF	2 KIIs
	Total Interviews		16

*IDI= In-Depth Interview *KII= Key Informant Interview

3.5 Data quality assurance, validation and analysis

Fieldwork quality in the assignment was maintained through a rigorous monitoring process. A senior researcher monitored the performance of data collection teams on a sample basis to ensure accuracy and consistency. Any necessary comments or corrections were provided promptly to improve data collection procedures.



Qualitative data collected during the fieldwork was transcribed and systematically analyzed using Atlas ti, a qualitative data analysis software. Thematic Analysis was utilized during the current study with codes being developed in the initial stages. Further, these codes were combined to create Themes so that a deeper understanding of the data could be arrived at and meaningful insights and key themes or patterns could be identified in the data.

3.6 Ethical considerations

The interviews with the general public raised important ethical considerations that were carefully addressed during the research process. Before conducting interviews, explicit consent was obtained from participants, particularly in cases where interviews were conducted virtually and involved voice recordings. In instances where consent for voice recordings was not provided, researchers relied on field notes as the primary source for coding and analysis.

Confidentiality was maintained throughout the study, with researchers ensuring that participants' identities and personal information remained protected. Participants were informed of their right to withdraw consent at any point during the study, and recordings were destroyed after the conclusion of the research, following agreement from the Honeywell Team.

Furthermore, participants were informed of any potential risks or harm associated with their participation in the study, and the purpose of the research was communicated to them. These measures helped to ensure that the research was conducted ethically and under established guidelines for research involving human participants.

3.7 Limitations of the Study

The challenges and limitations faced during the implementation and evaluation of the project include:

- Response Bias: Self-reported data from participants may be influenced by social desirability bias or other factors, leading to responses that do not fully reflect their actual experiences. This can affect the accuracy and reliability of the findings.



- Time Gap: The time gap between the implementation of the project and the study may introduce recall bias and affect participants' ability to accurately recall their experiences. This can impact the validity of the data collected and the narrative of the intervention's effectiveness.

- Scheduling Constraints: Difficulties in scheduling meetings and obtaining reports within specified timelines may hinder the collection of timely and comprehensive data. This can delay the evaluation process and affect the overall assessment of the project's outcomes.

- Personnel Changes: The turnover of personnel, particularly in government settings during the COVID-19 pandemic, may result in challenges in accessing participants with lived experience of the intervention. Personnel changes can impact the continuity and implementation fidelity of the project.

- Preparedness Activities: Certain interventions have been majorly implemented as preparation for future pandemics, complicating detailed impact analysis. Evaluating their effectiveness might necessitate long-term monitoring and evaluation.



Figure 3: IDI conduction with hospital staff



MAJOR FINDINGS AND ANALYSIS

The story of any intervention begins with identifying the ground needs and the rationale behind the intervention. Subsequently, the process of implementation, the impact, effectiveness, efficiency, and sustainability of the intervention are examined. Finally, there's an exploration of potential improvements for future interventions.

HHSIF's major COVID-19 interventions were implemented from April 2021 - August 2021 and can be categorized into two primary areas: infrastructural support to aid patient care and measures addressing the acute oxygen shortage during the pandemic.

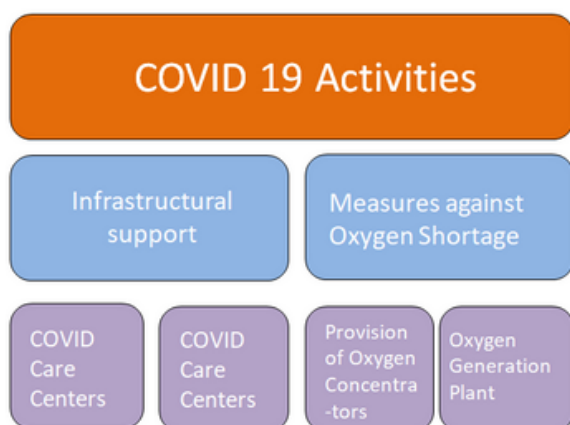


Figure 4: Major intervention by HHSIF

Thus it's essential to delve into the effectiveness and impact of these interventions, identifying areas of success and areas needing improvement. Evaluating and incorporating feedback from stakeholders would also be crucial for optimizing future interventions.

4.1 Infrastructural Aid for COVID-19 Patient Care

Relevance and Coherence of Intervention

During the COVID-19 pandemic, a significant challenge in India was the lack of adequate healthcare infrastructure, particularly in the public sector. Private healthcare, often expensive and inaccessible to many, left public healthcare as the primary option for a large portion of the population (Prachi Singh et.al, 2020).



Isolation wards for critical cases and intensive care units were crucial necessities within the Indian context. Thus HHSIF has assisted by the creation of Both CCCs and CCs across India. HHSIF's intervention focused on rural areas with high COVID-19 case numbers and oxygen shortages, where interventions of other forms were struggling to reach. In some instances, government offices communicated specific needs to the organization, leading to the creation of necessary facilities.

Several factors guided the selection of intervention areas, including the need assessment by the government, remoteness, travel time to hospitals with sufficient facilities, support from government officials and local communities, population demographics, etc (Hospital Staff). Interventions were primarily implemented in densely populated areas with poor or lower-middle-income populations experiencing high rates of COVID-19 prevalence.

“ *In the case of Bharat Bhaagya Vidata facility, there was somebody was willing to take charge of work with the patients. At that time even if the resources were available, we needed people who would run these places because only the resources would not help. There had to be people who would work so Bharat Bhaagya Vidata was chosen at that time.*

(CSR activities In-charge during COVID, Gurugram)

“ *Yeah actually at that time when suddenly the number of cases increased most of the hospitals were not prepared to handle the patient load and many cases were requiring ICU admission with oxygen supply, we are very happy that we received the supply from your Honeywell agency.*

(Medical Officer, Joida Taluk hospital)

These interventions were designed as one-time investments to address immediate needs during the COVID-19 pandemic while also assisting the health department in potential future pandemics. Hospital staff have attested to the significant benefits of these interventions during the COVID-19 crisis, noting that the implementation was prompt and timely. Stakeholders specifically highlighted the speed at which facilities were arranged, with some being accomplished within as little as 24 hours of needs being identified.

Efficiency and Effectiveness of the Intervention

In the healthcare sector, efficacy refers to the capacity of an intervention to bring about beneficial change, while effectiveness pertains to the performance of that intervention in real-world conditions. Therefore, assessing the efficiency and effectiveness of an intervention is crucial in evaluating its impact (Burches Enrique & Burches Marta, 2020).



The COVID Care Centers (CCC) and Critical Care Centers (CCU) were established in 2020 and remained operational until 2023. The CCC served as isolation wards for COVID-positive patients, while the CCU catered to individuals with low oxygen saturation, particularly those requiring immediate attention in the "red zone." Patients were assessed upon arrival to determine whether isolation or critical care was necessary. Those requiring critical care were either treated in CCUs or transferred to ICUs with CCU facilities.

CCC facilities typically accommodate up to 20 beds to accommodate a larger number of patients. According to the Health Inspector in Karnal, these facilities operated at 40-60% capacity throughout the period until 2023. The establishment of CCCs aimed to provide accessible and safe facilities approved by the community.

Creating these facilities presented significant challenges and was considered one of the most difficult interventions by the implementation team. Challenges included obtaining government and community approval, and recruiting staff and personnel willing to work in these facilities, among others.

Sustainability of the Intervention

Sustainability in program management is defined as the continued use of program components and activities to achieve desirable outcomes over time. This is essential as interventions often require significant investments in human, financial, and technical resources. Neglecting sustainability could lead to wastage and inefficiency (David Roger Walugembe et.al, 2019).

Regarding the Critical Care Center, it has been reported that the machines utilized are still operational within hospitals, extending ICU capacity. Machines such as the portable X-ray machine and laryngoscopy equipment have proven particularly useful, enabling bedside X-rays for non-ambulatory patients and aiding in diagnosis. This has been testified by the doctor at the COVID Critical Care Center in Bengaluru

“ We have shifted these materials into PHCs and other small rural sub-centers utilization. So that the facilities in these small hospitals could be improved to their maximum capacity.

(Medical Officer, Guragaon)





“ Now all the machines are very useful. The x-ray portable machine is now being used to take X-rays at the bedside, in ICUs, and all for patients who are not ambulatory. Monitors and all we have now established in the ICU setup to improve ICU care. Laryngoscopy and suction cups are also very useful and used in the ICU setup. Ventilators are also used, and defibrillators are also being used currently. Bifarscopes are also being used. The monitors are also being used. We increased the number of beds in the ICU and we have used these machines to increase the beds in the ICU.

(Nodal Officer, Bowring and Lady Curzon Hospital) ”

Similarly, materials provided in COVID Care Centers, many of which were standalone units, have been repurposed after the decline in COVID cases. Stakeholders have mentioned that the materials received from Honeywell is enough to create a mini hospital setting. These materials have been relocated to remote Primary Health Centers (PHCs) to enhance their capacity, benefitting other patients beyond the pandemic period. This approach underscores the sustainability and continued utilization of resources beyond the initial intervention phase.

4.2. Measures to alleviate Oxygen Shortage

Relevance and Coherence of Intervention

Oxygen has always been crucial in hospitals for treating various conditions such as myocardial infarction, asthma, acute head injuries, and road traffic incidents. Traditionally, this need was met through the use of oxygen cylinders and concentrators.

However, the sudden surge in COVID-19 cases resulted in a significant shortage of oxygen concentrators and cylinders in hospitals. Procuring these oxygen sources became a major challenge, requiring extensive time, effort, and expense (Jeffery Gettleman et.al, 2021). Hospital staff testified to the difficulties, with stakeholders working overnight to arrange for oxygen cylinders and transport them within hospitals to treat patients. Despite these efforts, deficiencies in meeting oxygen requirements persisted, posing ongoing challenges for patient care.





HHSIF has addressed this need by donating 1000 oxygen concentrators and by setting up 10 Oxygen Generation Plants (OGPs) in various facilities across India. The aim is to ensure readiness for future pandemics or COVID waves.

“ *The help was needed, and we received it. Initially, we faced a lot of troubles in the procurement and logistics of cylinders. We used to look out for oxygen in many places and hospitals, but with the start of the plant, we were able to save time, labor, and effort.*

(OGP Incharge, Khedakar Hospital) ”

The oxygen concentrators have been handed over to government officials for deployment in areas of need. State officials have testified that the oxygen concentrators were promptly provided and utilized for the treatment of COVID-19 patients. Regarding the Oxygen generation plant they were created as a preparatory measure this along with various field challenges; have taken around 3-6 months in setting up. From the analysis, it could be seen that the OGP that were established earlier and in areas where the patient load was high have been beneficial to the patients.

Efficiency and Effectiveness of the Intervention

The Oxygen Generation Plants (OGPs), created with the assistance of Americare as the on-ground partner, typically had a capacity of 600 LPM and came with a one-year warranty. Unlike traditional plants, these OGP not only have the capability to connect each bed using pipes but also support the refilling of oxygen cylinders, eliminating the need to transport oxygen cylinders within the hospital while also helping other nearby hospitals in refilling their depleted oxygen cylinders. For the initial year, maintenance and other actions were managed by the implementation agency and vendors at the ground level, after which the responsibility for proper functioning was handed over to the hospitals.

Setting up the OGP posed numerous challenges for the implementation team. These included difficulties in working with government offices, coordinating with multiple stakeholders, logistical challenges such as transporting machines from vendors in Delhi, the technical setup of the machines, shortage of willing manpower, and creating the necessary infrastructure to support OGP functionality. Despite these challenges, site visits were conducted by the implementation team to ensure the quality of facilities provided.





“ We needed to check the space wherein the oxygen generation plant has to be created- there would be fellows would go to inspect the site- then PWD inspection would be done- Pipelines would be put by the pollution board and electric department and- then this has to be adjusted in such a way that the load produced by the plant could be dealt with. All this was an immense and complex process that took around 6-9 months to complete setting up.

(Project Staff, On-ground partner)



Training sessions lasting a week were conducted for hospital staff on OGP operation, covering topics such as oxygen generation, compressor function, initial purity checks, and maintenance procedures. Some state governments, like Haryana, further provided training to ensure staff competence in operating the facilities. Additionally, a group of documents, including layout details, plant specifications, and emergency contact information, were handed over to hospital in-charges to facilitate the proper functioning of the plant.

After the initial setting process, the implementation team and on-ground partners also worked to address challenges hindering proper OGP functioning, such as power shortages and cuts in remote areas in collaboration with government officials. Maintenance activities were effectively conducted in these spaces for a year following their establishment.

However, It has to be noted that these OGPs were set up with the idea that they could be used for consequent COVID waves or future pandemics. This along with the challenges faced in setting up the facility, meant that the OGPs these facilities were established towards the end of the second wave of the pandemic (depending on the remoteness of the location) and were able to assist approximately 1000-1500 patients before the end of the COVID-19 pandemic.

Therefore, the creation of OGPs should primarily be viewed as a preparedness activity, serving as a proactive measure to enhance the country's readiness to tackle similar health crises in the future.



Sustainability of the Intervention

Preparedness and the potential for future use are crucial elements to consider when assessing the value of Oxygen Generation Plants (OGPs) as an intervention as it was created with that aim in mind. This forward-thinking approach acknowledges the long-term benefits of such infrastructure investments beyond the immediate crisis, ensuring that resources are utilized effectively to enhance the nation's resilience and response capabilities against future health emergencies.

“With us, this is more like a preparedness kind of thing, like last time regardless of how much we were spending we were not able to get enough oxygen, we know how much we struggled to get 10-20 cylinders back then, so after this came 200 patients would get covered in this at a time. I think we could cover up to 900 patients at a time.

(OGP Assistant, Civil Hospital-Gharaunda)

“There was no oxygen supply or anything of that sort, it was a jungle area so if you needed to get oxygen then you needed to go 100 to 150 kilometers we had to go. So it was a good thing that we got the oxygen generator here at our place itself. So that we could use it in times of emergency or something we could use it.

(Doctor, Joida Taluk Hospital)

To ensure proper functioning of the OGP the plants have been checked by the on-ground partners every 6 months to ensure that the plants can function when a future pandemic happens (Project In-charge, Implementation team). With regards to Oxygen Concentrators, the ownership of which has been given to the state authorities it has been mentioned that the device is of great quality and can be used in case of oxygen emergency in future (CSR activities In-charge during COVID, Gurugram). Thus seeing the interventions as something that would play a major role in the preparation for a future pandemic.



4.3 Experience of Stakeholders

OGP Staff



Figure 5: Experience and Quality rating by OGP Staff

The Oxygen Generation Plant (OGP) staff expressed complete satisfaction with the quality of the plant, with 100% of participants indicating their happiness with it. Their overall experience of association with the implementation agency has been rated at 8 out of 10. Hospital staff particularly appreciated the promptness with which technical issues were addressed by the implementation partner, expressing satisfaction with their efficiency in follow-up, query resolution, and maintenance.

“ We faced a few technical issues initially with the plant and raised a query for it. Within a short time after raising the issue by email, the technician arrived at the hospital in 2-3 days and addressed the issue. Americare is very efficient regarding follow-up, query addressing, and maintenance.

(Doctor In-charge, Khedakar Hospital)

Hospital Staff

During that time materials and facilities were scarce in general in the nation. Thus, it was testified that these facilities were very useful in containing COVID in respective areas:

“ So before getting all these pieces of equipment, it was difficult to check the condition of the patient and we were unable to handle so many patients. So after receiving things we were able to organize the treatment and it made it easy for us to provide the treatment.

(Nodal Officer, Bowring and Lady Curzon Hospital)



The best thing was Honeywell supported the administration in a quality manner. There was wide praise that the quality of materials provided was really good. Secondly, because HHSIF has supported us, other organizations like ISCON, and Akshaya Patra also started sponsoring us. Honeywell's association created trustability in our functioning and other sponsors also started joining us.

(Medical Officer, Gurugram)



The materials provided by HHSIF have been used to expand the facilities within the hospital and are currently being used for other needs in the hospital. Hospital Staff have also testified that all these materials were of good quality and had warranties of at least around 2 years, these equipment would be working faultlessly for some time (CSR activities In-charge during COVID, Gurugram).

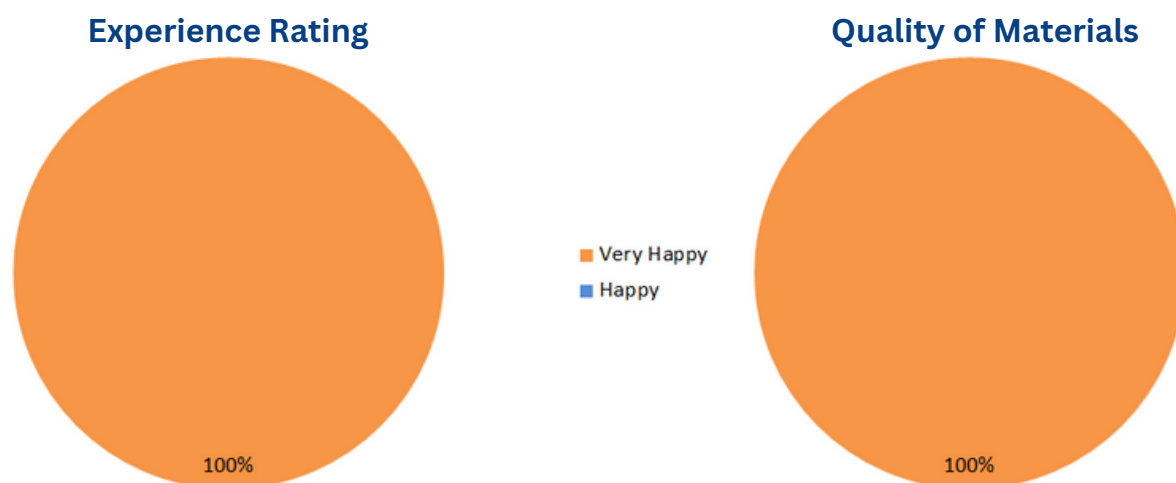


Figure 6: Experience and Quality rating by CCC and CC Staff

100% of the participants from CC/ CCC have mentioned that they are extremely happy with the quality of materials provided and their association with HHSIF.

Special mention has been made of the implementation teams' meticulous attention to detail during the design phase of the center, where even the smallest details were carefully considered. Additionally, their quick decision-making skills have been highlighted, with crucial decisions made within as little as 24 hours, demonstrating their responsiveness to the urgency of the situation. This has been achieved because of the commitment and the understanding manner in which the implementation team and the on-ground partners have worked towards achieving the goal.



“ Everyone understood that COVID doesn't give us the time gap to make decisions at a usual pace. So when at an organizational level there is a commitment, then a lot of actions could be made in a pacy manner. Leadership has given a blanket go-ahead to all the activities with the finance team being mentioned to disburse funds within 2-3 days, agreements have to be sorted and signed within a week. On-ground partners (Americares) have also implemented the process in a very fast manner. Everyone was functioning in a very fast manner which is why the decision-making happened in a fast manner.
(Program In-charge, Implementation agency) ”

Furthermore, there has been a general sense of positivity regarding Honeywell's involvement, as it has attracted other organizations such as ISCON and Akshaya Patra to support the center. Staff at Gurgaon mentioned that their association with HHSIF has led to sponsorship from other organizations, illustrating the ripple effect of HHSIF's involvement.

Overall, stakeholders have expressed a desire to associate with HHSIF in future emergencies, highlighting the confidence and trust placed in the organization's capabilities and commitment to effective crisis management.



Oxygen Generation Plant at Karnal, Haryana



RECOMMENDATIONS



Continuous and Regular Training Sessions: Implementing periodic training sessions would be beneficial, especially for facilities located in government settings where staff turnover is high. This would ensure that during future emergencies, the facilities can be swiftly brought into functional operation without significant delays.



Appointment of Special Staff for OGP: It is essential to designate specialized staff for the operation of Oxygen Generation Plants (OGP). Healthcare workers who are already burdened with hospital duties may find it challenging to manage OGP operations efficiently, as these machines require technical expertise due to the high-pressure nature of their functioning. Therefore, recruiting dedicated staff solely for OGP operation would ensure smoother operations in the long run.



Ensuring Provision of Supportive Measures for Facility Functioning: Adequate provision of supportive measures is crucial for the seamless functioning of facilities like OGPs. For instance, some plants, such as the one in Joida, require a high electricity consumption of 120 KW for operation. However, delays in obtaining government permission for installing 120 KW lines have forced these facilities to rely on costly alternatives like generators. Addressing such logistical hurdles is essential to optimize the utilization of these facilities.



Reaching a Wider Audience During Emergencies: Extending services to a broader audience during emergencies can significantly amplify the impact and help more people in need. By reaching out to a larger population, the interventions can effectively mitigate the challenges posed by emergencies and provide timely assistance to a greater number of individuals.



CONCLUSION

The COVID-19 pandemic has inflicted widespread devastation globally, resulting in approximately 5.5 million deaths worldwide. In India, the impact has been particularly severe, with over 5 lakh reported COVID-related deaths and millions affected by the virus. The second wave of the pandemic, in particular, exacerbated shortages in medical facilities, healthcare personnel, and oxygen supplies across the country.

In response to these critical challenges, the Honeywell Hometown Solutions India Foundation (HHSIF), a non-profit organization responsible for Honeywell's CSR activities, intervened through two major initiatives. Firstly, they provided infrastructural aid by establishing COVID-19 Critical Care Centers and COVID-19 Care Centers. These centers were strategically located based on COVID-19 prevalence and accessibility to nearby hospitals, catering to the urgent healthcare needs of patients. The materials used in these facilities were of high quality, and the rapid decision-making and intervention by HHSIF were lauded by stakeholders. Additionally, materials from these centers were repurposed, contributing to the overall healthcare system, either within the same facilities or in remote Primary Health Centers (PHCs).

Secondly, measures were taken to address the oxygen deficiency crisis by donating oxygen concentrators to both private and government healthcare facilities and establishing Oxygen Generation Plants (OGPs). While oxygen concentrators were instrumental during the second and third waves of COVID-19 and continue to be utilized, OGP's were predominantly set up as a preparedness measure for possible subsequent COVID waves or for future pandemics, limiting their immediate impact due to lower patient loads. However, this would be a potential measure against future pandemics, preventing oxygen shortages in affected areas.

Overall, the interventions undertaken by the HHSIF have been highly relevant and effective in addressing the challenges posed by the COVID-19 pandemic. Stakeholders applauded the quality, sustainability, and promptness of these measures, expressing eagerness for future collaborations with HHSIF.



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1. HOSPITAL STAFF QUALITATIVE

SI No	Demographic Details	Probes
1	Name of the Interviewer:	
2	Name of the Interviewee:	
3	Name of the COVID care centre:	
4	Position within the COVID care centre:	
	COVID Care Center/ COVID Critical Care Center	
SI No	Questions	
1	Has the facilities been established in a timely manner?	When was it established, time period taken for setting up of the facility, time period when setting was functional
2	How many beneficiaries have availed the medical help and what was the nature of the medical help availed?	Approximate number of beneficiaries who have availed the facility, period of operation of facility
3	Could you tell us how the COVID Care Center have helped during COVID?	condition before and after, how the placement of the facilities helped,
4	In the hypothetical scenario of another COVID happening tomorrow, then how would we be able to utilise the facilities that have been created ?	how much of the facilities could be used for this, what other equipment are needed for conduction of program, what are other facilities needed for further pandemic
5	What improvements or additional support would you recommend for future similar initiatives?	
6	On a scale of 1-10, could you rate your experience working in COVID Care Centre?	
7	On a scale of 1-10, could you rate the quality of the materials in the COVID Care Centre?	
8	On a scale of 1-10 could you rate your experience with the Honeywell foundation?	
9	Any other suggestion/ comments that you would like to share	



2. OXYGEN GENERATION PLANT STAFF

SI No	Demographic Details	Probes
1	Name of the Interviewer:	
2	Name of the Interviewee:	
3	Name of the Hospital:	
4	Position in the Hospital:	
SI No	Questions	
1	Has the facilities been established in a timely manner?	When was it established, time period taken for setting up of the facility
2	Were trainings provided by Americares foundation? If yes could you explain the contents of the trainings?	Staffs who were involved, major contents with respect to the oxygen generation plant that are discussed
3	Can you explain how Oxgen Generation Plant have helped during the COVID time period?	Pre requirement of Oxygen cylinders, how was the need met, what was the process of dispersing the Oxygen cylinder, Post condition within the district
4	How many beneficiaries have availed the service?	Approximate number of Oxygen cylinders sold, Major consumers of the oxygen cylinder, time period of operation of facility.
7	In the hypothetical scenario of pandemic of a similar nature how the established facilities will help you to fight the same? What is the preparedness of the existing system?	how much of the facilities could be used for this, what other equipments are needed for conduction of program
8	Were there any unexpected positive outcomes or lessons learned from operating the plant?	
9	On a scale of 1-10, could you rate performance of the Oxygen Generation plant?	
10	On a scale of 1-10, how much would you rate ease of assistance from the Americares foundation?	



3. ON-GROUND PARTNERS

SI No	Questions	
1	Name of the Interviewee:	
2	Name of the Interviewer:	
3	Could you give a brief about your role in the creation of COVID Critical Care Center and COVID Care Centre?	
4	What was the condition on the ground before the intervention?	need assessment, choice of location for setting up oxygen generation plant
5	Could you tell us about the specifications of the Oxygen generator plant setup in these facilities?	warranty, output that they produce, subsidiary equipment that have been provided
6	What are some of the support structures that have helped during the setting up of Oxygen generation plant? *Emphasis on help received from the HHSIF	Funding help, other technical support received, training or other forms of support received
7	How was the overall experience with Honeywell foundation and their funding?	Ease of functioning,
8	What are the maintenance activities which have been conducted on the Oxygen Generation Plant?	amount of money utilised on maintenance works, hurdles faced while trying to conduct the maintenance works
9	In the hypothetical scenario of another COVID happening tomorrow, then how would we be able to utilise the facilities that have been created ?	how much of the facilities could be used for this, what are other facilities needed for further pandemic
10	What recommendations or improvements would the implementation partner suggest for future collaborations?	
11	On a scale of 1-10 could you rate your experience of working with Honeywell to your organization?	
12	On a scale of 1-10 how important was the funding of Honeywell to the intervention?	
13	On a scale of 1-10, could you rate the quality of the materials in the Oxygen Generator Plant?	