

# Strengthening Capacity for COVID-19 Clinical Management in Papua New Guinea

From May 2020 to December 2021, the Meeting Targets and Maintaining Epidemic Control (EpiC) project funded by the United States Agency for International Development (USAID) provided technical assistance (TA) and capacity strengthening for the Papua New Guinea (PNG) health system to respond to the COVID-19 pandemic and prepare for future epidemics. The United States Government (USG) provided US\$350,000 through USAID to build the capacity of PNG health providers and facilities to manage severe COVID-19 and other conditions that require critical care. EpiC collaborated closely with the National Department of Health (NDoH) to strengthen the capacity of the government to receive, install, and use ventilators for the management of patients who require breathing support. EpiC began the activity with an assessment of targeted health facilities to identify gaps in critical care capacity. Subsequently, EpiC provided training for facility health workers on critical care, including practical skills on mechanical ventilation. The initial training was followed by clinical mentoring to strengthen the health system's capacity to respond to the ongoing COVID-19 surge in infections and to prepare for future epidemics. To scale up and sustain achievements, EpiC partnered with the Society of Anesthesiologists in Papua New Guinea (SAPNG) to develop a training package and disseminate standard operating procedures (SOPs) for improvement in the quality of critical care.

## EPIC'S KEY ACCOMPLISHMENTS

- Conducted facility-level assessments of hospital capacity to provide critical care and identified TA needs in 17 selected health facilities
- Trained 61 clinicians in critical care and management of patients who need breathing support
- Trained six biomedical engineers to set up and operate ventilators
- Provided operations and coordination support to facilitate the installation and use of USG-donated ventilators
- Provided 19 health facilities with clinical mentoring and TA to improve critical care

## ACTIVITIES AND ACCOMPLISHMENTS

### ADDRESSING KNOWLEDGE GAPS THROUGH FACILITY-LEVEL ASSESSMENTS

EpiC PNG conducted a detailed assessment of the capacity of health facilities to provide critical care. The assessment report included results from 17 health facilities and provided information to the government and other stakeholders on existing capacity and gaps in human resources, infrastructure and equipment, medicines, infection prevention and control, and training needs to

strengthen the health system to manage clients with severe COVID-19, including patients who need breathing support. The assessment highlighted critical actions needed to sustainably build capacity for critical care and served as a key planning resource for NDoH and humanitarian clusters for COVID-19 response and preparedness. NDoH and SAPNG responded positively to the report and issued a strong statement of commitment to advocate for additional health facility assessments as part of efforts to strengthen critical care support. Shortly after EpiC and NDoH jointly disseminated the report to the National Control Centre (the national-level COVID-19 response coordination body), the health cluster prioritized critical care training as a major gap requiring support. The facility assessment report was also used to identify skill gaps that the EpiC project, in collaboration with NDoH and SAPNG, subsequently addressed through training and clinical mentoring.

### **BUILDING CAPACITY IN CRITICAL CARE**

Considering the high level of training needs identified in the assessment, EpiC developed a training plan with NDoH and provided national- and site-level TA to facilities receiving the USG-donated ventilators, as well as other facilities that needed the support. EpiC supported the SAPNG to finalize a training manual on mechanical ventilation by reviewing and revising the content to include relevant sections on COVID-19 and the use of ventilators, which was subsequently used in critical care training programs for health workers supported by other stakeholders. EpiC also provided technical materials to facilitate virtual capacity building for health facilities. In total, 61 health workers from 15 health facilities received training on critical care, the operation of ventilators, and management of clients in need of breathing support. Sixteen trainers, including 13 anesthesiologists and three biomedical engineers, participated in a training-of-trainers forum to build their skills on new knowledge and competency in the rollout of critical care for COVID-19 patients. This TA boosted the national COVID-19 response by building the capacity of staff shifted from standard wards and facing new challenges in the management of patients with severe COVID-19. Following the training, six health facilities began using ventilators for patient treatment for the first time. The training built the competency of health workers to manage clients requiring critical care, including severe COVID-19. To ensure sustained use of the ventilators, the project also trained biomedical technicians at the national and provincial levels on operating, maintaining, and troubleshooting any potential technical issues with the ventilators.

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*Prior to the ventilator workshop, physician anesthetists operated mechanical ventilators... Since the training, nursing officers can now competently set up ventilators, dial different settings to suit the clinical condition of the patient, and wean patients from the ventilators.*

—Dulcie Nagivalena, nursing officer from Alotau General Hospital, Milnebay Province

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### STRENGTHENING COVID-19 CASE MANAGEMENT AND THE REFERRAL SYSTEM FOR CRITICAL CARE

EpiC supported the installation and use of 21 of the 40 donated ventilators during the project's implementation period. The NDoH Health Facility Branch deployed the remaining ventilators. Supervision reports showed that by the end of the activity, 11 out of the 17 health facilities targeted for support were managing patients on ventilators. The remaining six facilities either did not have ventilators, were referring patients requiring breathing support to other facilities, or had not received any clients in need of breathing support. In addition to bedside use in the intensive care ward or critical care unit, the ventilators were found to be suitable as transport ventilators, particularly in rural areas, given their long battery life. The SAPNG provided guidance for health facilities to use the devices for the transfer of patients between emergency rooms and wards, as well as from smaller to larger health facilities by ambulance for continuity of critical care.



Photo credit: Simon Nianfop, FHI 360

*Health workers in PNG participate in a practical session on how to use the USG-donated ZOLL ventilator.*

### COORDINATING WITH STAKEHOLDERS

The EpiC team in PNG joined the national COVID-19 response coordination team and advocated for strengthening the quality of care and planning for sustainable critical care services at all provincial hospitals. EpiC actively participated in the Health Cluster and National Control Centre meetings, providing weekly updates and coordinating with other partners to ensure efficiency and the best use of resources.

### Conclusions

The EpiC ventilator TA project supported the government's COVID-19 epidemic preparedness and response and worked with key stakeholders to collectively build the capacity of the health system in Papua New Guinea to improve critical care services. Information obtained from the facility level assessment informed the capacity-strengthening efforts of the project. EpiC's TA to health facilities on COVID-19 critical-case management continues to support patients and strengthen the health system's capacity to respond to ongoing surges in cases. EpiC built the capacity of NDoH biomedical engineers to receive and install any brand of ventilators, and the project continues to deploy the remaining donated ventilators (after they have been calibrated at the national level) and train recipient facilities on their use.

## Lessons Learned and Considerations for Sustainability

EpiC identified several important lessons to consider in future programming involving the international donation of equipment such as ventilators, and the project proactively engaged with the NDoH to identify ongoing solutions. Key lessons include:

- Although EpiC supported the training of 61 clinicians, built the capacity of six biomedical engineers, and provided 19 health facilities with clinical mentoring and TA, the number of health workers trained on critical care, including the use of mechanical ventilators, remains suboptimal in PNG given the high level of need. To avoid burnout, especially during COVID-19 surge periods, an institutionalized training program that adapts to the country's needs and the conditions of the health situation is essential.
- To sustain these capacity-building efforts, EpiC provided resources the PNG team can use, helped to finalize the ventilator training manual and training-of-trainers curriculum, and printed and distributed SOPs on emergency care. EpiC provided PNG, as well as all other participating countries, with an open-source link to knowledge resources on critical care that is regularly updated to include the latest evidence.
- Stock-outs of ventilator consumables can directly limit the effective use of the machines. PNG requires a national-level plan to ensure the availability of critical commodities related to intensive care. EpiC provided open-source online materials to guide forecasting and quantification of critical care commodities and consumables to partners in PNG.
- Local capacity must be built for the maintenance and annual calibration of the specific brand of donated ventilators to avoid the burdensome requirement of regularly shipping equipment from facilities to the capital and ultimately overseas. This was logistically challenging and caused gaps in service delivery.
- The complete oxygen ecosystem should be evaluated and strengthened, including the availability of medical oxygen itself as well as accessories for oxygen delivery, to enable facilities to provide effective critical care and ventilatory support.
- Providing TA that was complementary to the delivery of ventilators proved to be a life-saving intervention for many in this island nation. Beyond the 17 health facilities selected to receive the donated ventilators, all 22 provinces of the country benefited from the tools produced and disseminated. The TA complemented the efforts of the government of PNG to strengthen the capacity of intensive care units and high-dependency units in all provinces.

## SUCCESS STORY

### TRAINING AND TASK SHIFTING BRIDGES THE GAP IN HUMAN RESOURCE CONSTRAINTS FOR CRITICAL CARE OF COVID-19 PATIENTS IN PAPUA NEW GUINEA

Sister Dulcie Nagivalena is one of 61 clinicians trained by EpiC in the clinical care and management of patients who need breathing support. Sister Nagivalena, who is based in Alotau General Hospital, a rural hospital in Milne Bay Province of Papua New Guinea, noted that “prior to the USAID-funded mechanical ventilation workshop conducted by FHI 360 and SAPNG in August 2021, physician anesthetists operated mechanical ventilators. Doctors are not usually around in the intensive care units, instead concentrating in the operating theatre.” Given the limited number of anesthetists and doctors in rural facilities, there was a shortage of human resources available to support ventilator operation for patients requiring care, and anesthetists had limited time available to support routine patient care. To address this shortage, the in-service trainings provided by EpiC focused on task shifting the operation of ventilators to nurses and other health care workers with a comprehensive understanding of anatomy and physiology, while ensuring quality of care.

The in-service training empowered nursing officers at Alotau General Hospital and 18 other facilities receiving support to competently set up ventilators, input settings to suit the clinical condition of the patient, and wean patients off ventilator support. As a result of the knowledge and skills gained from the in-service training, nurses can receive orders from doctors over the phone and ventilate patients following the doctor’s instructions. Sister Nagivalena commended the training for supporting task shifting, an important tool for bridging the gap in human resource constraints in intensive care units in Papua New Guinea during periods of increased hospitalization of COVID-19 patients.



Sister Dulcie Nagivalena is a critical care nursing officer who completed her specialty training in critical care nursing at the School of Medicine and Health Sciences, University of Papua New Guinea. The mechanical ventilation training consolidated her skills and knowledge in critical nursing care. *Photo by Dulcie Nagivalena*

*Meeting Targets and Maintaining Epidemic Control (EpiC), a five-year global project funded by the United States Agency for International Development (USAID), EpiC is led by FHI 360 with core partners Right to Care (RTC), Palladium, and Population Services International (PSI). EpiC and its consortium members are implementing COVID-19 activities in more than 20 countries on three continents. In 13 of those countries, EpiC is providing technical assistance (TA) to governments and specific health facilities that received U.S. Government (USG)-donated ventilators and to health providers on COVID-19 clinical case management.*

*This brief is made possible by the generous support of the American people through the United States Agency for International Development (USAID). The contents are the responsibility of the EpiC project and do not necessarily reflect the views of USAID or the United States Government.*