Strengthening critical care capacity to manage COVID-19 patients in Bhutan

The United States Government (USG), through the United States Agency for International Development (USAID), provided the Royal Government of Bhutan with a donation of 15 ventilators for intensive care units (ICU) to assist its fight against COVID-19. The donation delivered on the U.S. administration's pledge to provide these critically needed supplies and support Bhutan's ongoing efforts to mitigate the effects of the COVID-19 pandemic in the country.

Between October 2020 and December 2021, EpiC provided technical assistance (TA) and capacity-strengthening support for critical case management to health providers and facilities. EpiC collaborated closely with the Ministry of Health (MOH) to strengthen the capacity of the government to receive, install, and use the ventilators. EpiC also led facility-level assessments of critical care capacity and resources and TA needs for the clinical management of COVID-19 and provided clinical TA.

EPIC'S KEY ACCOMPLISHMENTS

- Supported the installation of 15 ventilators across five hospitals
- Conducted five facility-level assessments to assess hospital capacity and identify training needs
- Trained 390 health workers (100 doctors and 290 nurses) in COVID-19 clinical case management
- Reviewed/developed eight key ICU protocols
- Developed a web-based COVID-19 equipment tracking system
- Trained 40 biomedical personnel on the use of the COVID-19 equipment tracking system

Activities and Accomplishments

COORDINATION WITH STAKEHOLDERS

EpiC collaborated with key stakeholders in-country to design, plan, and implement project activities. The donated ventilators were jointly inspected and installed by the Biomedical Engineering Division (BMED) of the MOH, and Must Healthcare (the local agent of Medtronic). EpiC's local consultant also joined to oversee the installation. Focal officials from BMED and the Emergency Medical Services Division within the MOH were designated to coordinate implementation of EpiC project activities and were engaged throughout the project. With the support of the MOH, the project could engage the only intensivist in the country at the Jigme Dorji Wangchuck National Referral Hospital (JDWNRH) as the clinical focal point for this project, formed a technical working group to help adapt and develop training materials and intensive care unit (ICU) protocols, and rolled out clinical trainings. The MOH and all stakeholders were informed of progress through regular one-on-one and review meetings led by Dasho Dr. Pandup

Tshering, honorable secretary of health for the MOH. For in-country coordination, EpiC partnered with Save the Children, Bhutan.

FACILITY-LEVEL ASSESSMENTS

Facility-level assessments (FLA) were conducted in December 2020 in the five facilities where the 15 donated ventilators were dispatched and installed, including the country's three referral hospitals. The assessment examined facility capacity to provide critical care, including care for mechanically-ventilated patients and effective use of ventilators. The findings suggested limited expertise to manage mechanically ventilated patients and provide critical care, and a general lack of ICU protocols in the facilities surveyed. The results informed the development of a training program and COVID-19 asset tracking system.

TRAINING ON COVID-19 CLINICAL MANAGEMENT

A training of trainers (TOT) model was adopted to roll out clinical trainings for health care providers on basic ICU management of COVID-19 patients. A total of 25 providers from the five facilities became master trainers using EpiC's Adult Case Management Series training curriculum. The curriculum was adapted by the technical working group to suit local needs and was peer reviewed by a clinical expert from the University of California San Francisco (UCSF). Since April 2021, about 390 health workers (including medical specialists, anesthesiologists, general medical doctors, intern doctors, and nurses) have been trained through 21 batches of cascade trainings. The clinical training initially focused on the five facilities where the USG-donated ventilators were installed and was later expanded to 45 of the country's 51 hospitals. The training sessions were facilitated by members of the technical working group and the master trainers, and some sessions were delivered by UCSF's clinical expert.

Photo credit: Dr. Ujal Pradhan, JDWNR Hospital

Participants practice intubation in a training session.

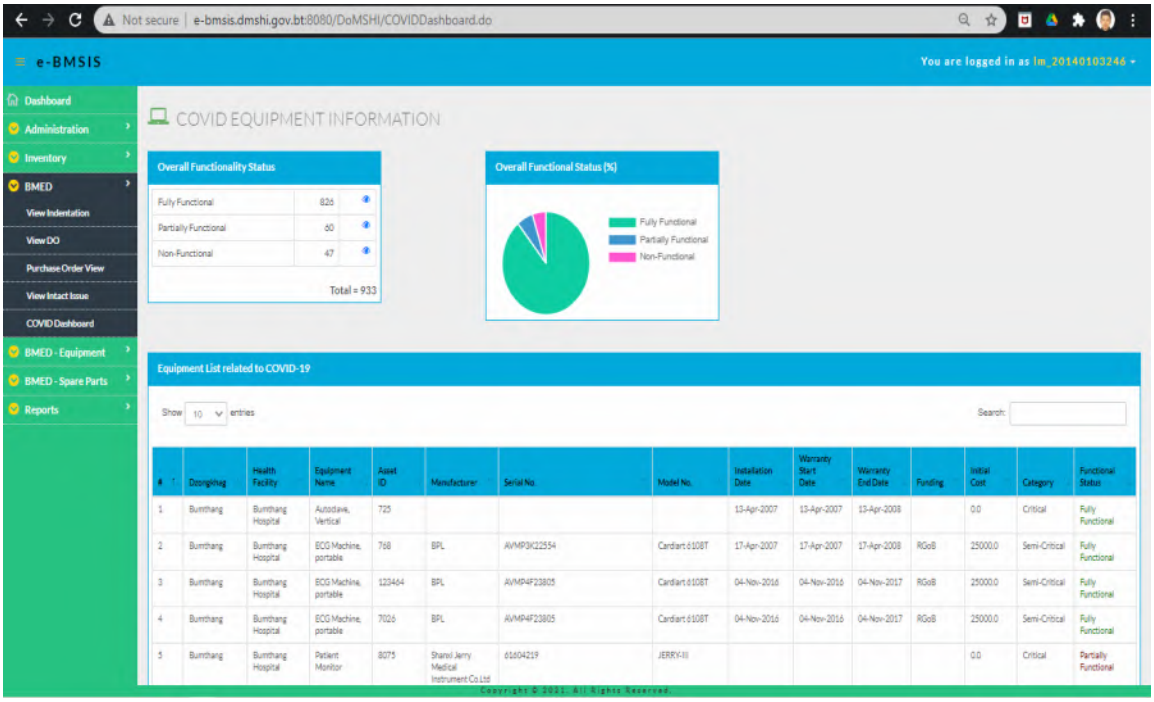
Additionally, the project supported the registration of 203 learners for the general online Fundamental Critical Care Support (FCCS) course offered by the Society of Critical Care Medicine (SCCM). The project also supported the registration of 114 learners for the FCCS obstetrics and pediatric courses. By the end of the project, around 160 learners completed the general FCCS, and 52 have completed FCCS courses in obstetrics and pediatrics. Two Medical Specialists, two Emergency Physicians, and an Anesthesiologist were also supported for the FCCs provider course to enable them to become certified FCCS instructors. They have submitted their application and are currently working towards fulfilling the instructorship requirements of the SCCM.

ICU protocols, books, and job aids

In response to recommendations from the FLA, the technical working group developed eight key ICU protocols with input and review from EpiC's clinical expert. The protocols covered acute respiratory distress syndrome (ARDS) ventilation, ventilator weaning, ventilator-associated pneumonia (VAP) prevention, paralysis/proning, sedation, early mobility, delirium prevention, and nutrition. The project also supported the procurement of 20 textbooks and training resource books on ICU and critical care. The technical working group developed job aids, quick references on critical care, quick references on advanced cardiovascular life supper and basic life support (ACLS/BLS), and posters on universal precaution. These materials were printed and disseminated to all facilities with ICU departments.

Ventilator tracking system and ventilator maintenance training

With support from the project, a web-based COVID-19 asset tracking system was developed to help the BMED of the MOH track COVID-19-related equipment in facilities across the country. A local IT consultant was recruited to develop and integrate the system into the MOH's national Computerized Maintenance Management System. Data on all COVID-19 equipment and spare parts were compiled by the BMED and shared with the consultant to be entered into the system.



A screen shot of the COVID-19 equipment tracking system

EpiC conducted two batches of training on the use of the asset tracking system for about 40 biomedical engineering personnel. The engineering personnel were also oriented on the repair and maintenance of ventilators by the biomedical engineer from Must Healthcare and the BMED. EpiC procured laptops to facilitate MOH use of the asset tracking system.

Conclusions

EpiC has enhanced the country's capacity to manage COVID-19 patients and provide care for mechanically ventilated patients. In his address during the FLA dissemination meeting, Dr. Tshering said "the technical assistance not only is beneficial during this pandemic but has also helped to strengthen the overall critical care capacity in the country." He noted that the FLA tool may be used in facilities where the MOH plans to establish ICUs in the future. Similarly, most participants of the clinical trainings have shared feedback that the training was very useful and that they gained knowledge, skills, and confidence in the management of patients needing critical care. This improvement in critical care knowledge was shown in significant increases in post-test scores compared to pre-test scores. For example, post-test scores increased by 60 percent among master trainers who attended the TOT, and post-test scores increased by 160 percent among doctors and nurses of the Eastern Regional Referral Hospital in Mongar who participated in the cascade clinical training.

The MOH requested that the three FCCS courses be kept open for those who have not yet completed the courses. The Emergency Medical Services Division under the MoH plans to use the training curricula on COVID-19 Adult Case Management and the pool of master trainers including those undergoing FCCS instructorship certification to train new recruits and provide refresher trainings to doctors and nurses in the future. Similarly, other resources gathered and developed through the support of the TA project such as the books on critical care and ICU management, ICU protocols, and job aids could be used to improve critical and emergency care. The MoH also intends to explore opportunities to mobilize resources through other sources and partners to expand and continue clinical trainings on critical care management.

Meeting Targets and Maintaining Epidemic Control (EpiC), a five-year global project funded by the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) and the United States Agency for International Development (USAID), is dedicated to achieving and maintaining HIV epidemic control. EpiC is led by FHI 360 with core partners Right to Care (RTC), Palladium, Population Services International (PSI), and Gobee Group. 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.

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