

Research Data Archive, Center for Disease Control, The Executive Yuan, R.O.C.
Readme file

Project Title: Personal Protective Equipment Management Integrated Research Plan

Project Number: DOH97-DC-1003

Executing Institute: Soochow University 、 National Yang-Ming University

Principal Investigator(P.I.): S.I. Ivan Su 、 Der-Ming Liou 、 Huan Lin

P.I. Position Title: Professor 、 Associate Professor 、 Associate Professor

P.I. Institute: Soochow University 、 National Yang-Ming University

Abstract:

The purpose of this integrated research is to assess and analyze current national personal protective equipment (PPE) preparedness plan and its implementation effects so as to provide suggestions for planning improvement to enhance the national pandemic disease preparedness planning and ceasing capability with the best utilization of resources. Because of limited research time and resource, the research focuses on key PPE items, namely N95 mask, protective clothing and surgical mask, many of which are overdue and cost a lot for keeping these items.

The integrated research is divided into three sub-researches, including (1) optimal inventory model and reverse logistics feasibility study for PPM; (2) study and assessment the requirements of PPE management information system alternatives to integrate national PPE resources; and feasibility study of establishing Taiwan as an Asia PPE supply Hub.

The research methods include literature collection and analysis, field study, expert meeting and interviews, and supply chain simulation to understand the current states and operations of foreign and domestic PPE supply chains. With the study results and insights, this research attempts to propose a proper public-private supply chain collaboration mechanism to increase the efficiency and effectiveness of current PPE supply chain operations.

The key findings and conclusions of this research are summarized below :

- 1 、 A full investigation and understanding of the operations of key suppliers of protective clothing, N95 and surgical mask were achieved.
- 2 、 This is the first time in Taiwan to conduct a full scale survey of the demand status of PPE users. The survey targets include local health authorities and all levels of hospitals. The research found that many users purchase, stock and manage PPE by themselves, some of them store their materials in poor environments and the turnover rate of PPEs are usually very low. These lead to serious overdue situation of many PPE items. In addition, individual purchasing does not allow for the efficiency generated by economic scale. Furthermore, the disposal rate of overdue PPE in hospitals is much higher than that in local health authorities.
- 3 、 PPE supply chain simulation analysis results showed that existing pandemic

protection and control standard in Taiwan is much higher than that of WHO guidelines. Under Taiwan standard, the safety stockpile of PPE in Taiwan is also much higher than the safety stockpile of PPE required by WHO guidelines. The research team suggests CDC to change current standard and adjust it to match WHO guidelines, thus reduce national PPE safety stockpile level.

- 4、 This research evaluated and compared current domestic and international PPE supply chain operational models. It then proposed a future PPE supply chain operational framework. CDC, local health authorities and responsible hospitals can arrange for group purchasing together, set up supply chain collaboration mechanism to allow for the turnover of PPE items, and use logistics service provider(s) to handle logistics operational activities.
- 5、 Analyzing existing data of MIS system, CDC stocks are the highest for both of N95 masks and protective clothing stocks and the actual stock have been far higher than the national inventory policy. Since the number of purchase, inventory, and consumption cannot be audited, the data were not reliable. The most frequently reported data of surveyed hospitals was consumption of N95 mask, and the least frequent was purchase of protective clothing. The responsiveness of MIS system is not good enough and needs improvement.
- 6、 Although users have a high degree of satisfaction for PPE MIS system, only 25% users had the will to use it and still 5.6 percent of the users considered that using system will increase the work time and workload. There were 55.5 percent of users believe that using MIS system can help PPE management, and health authorities with 80% in agreement gained most benefits by using MIS system. health authorities also had more satisfaction in using system, and surveyed hospitals considered that integration with other system should be helpful to simplify working flow of hospitals.
- 7、 In the proposed MIS system, operations are automated to replace manual operations. For integration among other systems, the new system can transmit electronic data with other systems, so that the information of PPE can be updated dynamically in real-time. The PPE deployment mechanism can be adjusted according to the organizational situations. The proposed MIS system has much higher flexibility.
- 8、 From the study of the feasibility of building a regional PPE supply hub in Taiwan for the Asian region, we suggested CDC should adopt PPE Logistics model applied by Singapore Public Health Bureau, with which we expect the flow of PPE storage will be improved by expanding the scale of PPE market and increasing the turnover rate of Taiwan PPE stockpile. After Singapore model are adopted in Taiwan, a feasibility study for Asia Pacific PPE regional supply hub in

Taiwan serving selected partner countries could be conducted in the future. The way to design and implement Singapore model in Taiwan, as we suggested, is to form a package contract which can harmonize the legal relationship between relating parties, CDC, PPE suppliers, public hospital and health authorities. The package contract including the following sub-contracts: the consignment contracts between PPE suppliers and third party logistics service providers, the management contracts between CDC and third party logistics service providers, Basic Ordering Agreements between CDC and PPE suppliers and sale contracts between PPE suppliers and healthcare institutes.

Keyword : Personal Protective Equipments, Supply Chain Management, Safety Stockpile, Reverse Logistics, PPE Management Information System, Asia Pacific Supply Hub