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Effective supply chain surveillance for PPE

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Control of the COVID-19 pandemic has been hampered by reported shortages of personal protective equipment (PPE) and other crucial supplies for health-care providers across the USA.[1] A key impediment to increasing the supply to meet this demand is reliable data on nationwide needs.[2] Reliable forecasting models could help provide information to more accurately scale PPE production, set expectations for health-care facilities on bidding and pricing, and enable appropriate deployment of resources, such as funds from the Coronavirus Aid, Relief, and Economic Security Act (2021).[3] However, predictive modelling of needs for key necessities during public health disasters are largely non-existent. To the best of our knowledge, the most comprehensive publicly available data has been the Get Us PPE shortage index, but it is an incomplete and non-representative picture of national PPE needs within the USA.[4] We recommend the following framework to better inform crisis response for inevitable future public health disasters.

First, there is a need to aggregate demand data. Similar to a strategy to estimate incidence of injuries in emergency departments, data should be collected from a representative sample of health-care institutions (eg, acute and non-acute care facilities and clinics) where PPE is necessary.[5] Key data elements and a comprehensive humanitarian data dictionary should be developed and redeployed in future scenarios (appendix).

Second, there is a need to aggregate supply data through periodic reporting by manufacturers and incentivised by a federal procurement commitment when a crisis occurs. The Drug Supply Chain Security Act (2013) provides a template for a track and trace programme using a unique serial number that can then] to develop aggregated estimates.

Third, we recommend using the collected data to project supply and demand trends over time. Integration of COVID-19 incidence rates, use of PPE by institution type, and supply available at representative institutions will help us forecast gaps. Integration of susceptibility indices that include socioeconomic and racial equity indicators ensures that the groups who are at high risk of being exposed to COVID-19 are prioritised for PPE distribution.

Finally, we need to drive action. Forecasts should have a clear call to action with predetermined benchmarks for supply chain preparedness and response, including activating the Defense Production Act (1950), offering large contractual commitments for PPE, and activating a designated national digital clearing house for PPE similar to how Get US PPE currently functions.

To our knowledge, no model currently fulfills this framework. Our framework enables the collection of appropriate data and the development of relevant live models that can inform PPE allocation during any future public health crises.

SH, RB, and MLR are unpaid volunteers and executive board members of Get Us PPE. SH is an unpaid lawyer for the American College of Emergency Physicians PPE Supply Chain Task Force. SH is on the advisory board for COVID Act Now and the Safeter app, cofounder of ConductScience, and a committee member for the American College of Emergency Physician PPE Supply Chain Task Force; receives research funding from the Foundation for Opioid Response Efforts, and reports personal fees from MazeEngineers, Withings, Boston Globe, and the American College of Emergency Physicians. RA is a member of the board of the US Global Health of the National Academies. MLR reports grants from National Institutes of Health (NIH) and the US Centers for Disease Control and Prevention, speaker fees from Medscape for talks about COVID-19 testing, and travel fees from the American College of Emergency Physicians and Society for Academic Emergency Medicine. MLR has participated on the Data Safety Monitoring Board for NIH Clinical Trials Network, was a former board member of the Society for Academic Emergency Medicine and American Foundation for Firearm Injury Reduction in Medicine, and is a current board member of the NonViolence Institute.

Supplementary Material

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mentary appendix

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