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CHEST

Reserve System Implementation During the COVID-19 Pandemic

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Reserve systems enable the equitable allocation of a resource by partitioning its total supply into multiple "categories," each allocated according to a separate principle.[1,2] Categories may be designed to differ in size, eligibility criteria, and allocation order. Effective implementation of reserve systems demonstrates that multiple ethical considerations can be prioritized concurrently to mitigate disparities across a population, all within a single framework. First described by Pathak et al,[3] reserve systems have been used to allocate both medical and nonmedical goods, including donor kidneys, United States (US) H1-B visas, and Boston public school assignments.[3]

The COVID-19 pandemic has created an unprecedented demand for biomedical therapeutics and equipment, necessitating the implementation of allocation frameworks both locally and nationally. In October 2020, the US National Academy of Medicine recommended that 10% of the total federal COVID-19 vaccine supply be reserved for areas in the top quartile of the US Centers for Disease Control and Prevention Social Vulnerability Index (SVI) within each state.[4] In response, some US cities and states implemented reserve systems to prioritize vaccine allocation among socially vulnerable communities and areas experiencing high COVID-19 incidence.[5-7]

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In this issue of *CHEST*, Rubin et al[8] examine the viability of a reserve system to equitably allocate COVID-19 monoclonal antibody (mAb) therapies to outpatients in a large urban health system.[8] Following guidance from the Commonwealth of Massachusetts,[9] the Mass General Brigham health system implemented a reserve system in which 20% of COVID-19 mAb infusion appointments were reserved for patients living in zip codes with an average SVI in the top quartile of the state and patients living in towns in the top quartile of COVID-19 incidence. A lottery was used to determine allocation priority if the number of eligible patients exceeded allotted infusion appointments.[8] Using this system, Rubin et al[8] found that a significantly greater proportion of patients who received COVID-19 mAb infusions came from socially vulnerable communities than would have been expected if infusions had been allocated using only a lottery (25.3% vs 17.6%). This work contributes to a growing body of evidence that reserve systems offer a pragmatic framework for equitably allocating scarce resources.[10,11] This work is the first to examine reserve system implementation on an individual patient level during a pandemic.[8]

As reserve systems become more prevalent, it is important to acknowledge and understand the psychological effects on participants. Not only do reserve systems enable policymakers to allocate resources equitably, but they also signal to participants that expert judgment has been used to design a system for maximal societal benefit. Participants eligible for prioritized categories (eg, patients from high-SVI zip codes) may feel more adequately safeguarded. Conversely, participants in nonprioritized categories should not feel disadvantaged. Ideally, reserve categories should be structured so that most, if not all, participants feel they have fair access to the resource. How participants perceive and experience reserve systems remains an open question and warrants further consideration through qualitative research.

Moreover, participant-reported outcomes should be regarded as a distinct endpoint from resource allocation outcomes. Health equity must not only be demonstrated objectively but must also be perceived by participants in

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the system. Rubin et al[8] reported that patients in the top SVI quartile (ie, the most vulnerable patients) declined mAb infusion appointments at a disproportionately higher rate (31.7% of those who declined vs 19.9% of total referrals). Unfortunately, this dampens the intended prioritization of patients from socially vulnerable communities[8] and may reflect socioeconomic differences in access to transportation or paid sick leave, trust in the health care system, or skepticism regarding novel therapeutics.[12] Ultimately, this disparity highlights an opportunity for improved patient outreach and education by clinicians and public health experts. Nevertheless, patients in the prioritized category may have felt sufficiently safeguarded by virtue of being offered mAb therapy, despite not receiving it. In such instances, offering the resource to a greater number of participants is inherently beneficial.

Despite challenges related to administering a time-sensitive, novel therapeutic during a pandemic, Rubin et al[8] demonstrate that a reserve system can be used effectively on an individual patient level to prioritize access for certain groups. Additional qualitative research would improve our understanding of how reserve systems are experienced by participants in prioritized and nonprioritized categories. We believe this innovative work may serve as a model for the future use of reserve systems by health systems in the United States and abroad.

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