

# Prioritizing the vulnerable over the susceptible for COVID-19 vaccination

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## Abstract

The COVID-19 pandemic led to a health crisis with widespread social and economic adverse effects. To address the fallout, vaccine development has been pursued in record time. Several vaccines have already been deployed in countries worldwide, but as the supply is limited, these have been provided selectively. Various allocation schemes, premised on ensuring an equitable distribution, have prioritized the elderly, given their apparent susceptibility. For the Philippines and possibly other countries with extremely limited supplies, the elderly need not always be given primary preference. The level of available supplies can be so low that the immediate focus of allocation should be on mitigating both infection and transmission. The proposed alternative vaccine allocation framework gives priority to groups rendered more vulnerable, such as those who are unable to avoid prolonged exposure to possibly infected people because of medical necessity or occupational conditions. Vulnerable groups include healthcare and other essential workers as well as patients requiring continued healthcare services. The proposed allocation scheme is meant to be complementary to concurrent public health measures, which have to be maintained though made less restrictive as the pandemic is brought under control.

## KEYWORDS

COVID-19, ethics, mass vaccination, Philippines, vulnerable population

## 1 | THE PANDEMIC AND THE PHILIPPINE CONTEXT

By the end of March 2021, around 129 million people have been cumulatively reported worldwide as having been infected with the SARS-CoV-2 virus. Though most have had only mild disease, COVID-19 can also be debilitating and even lethal. Globally, about 2.8 million people have already died from the infection.<sup>1</sup> The signif-

icance of “super-spreaders”, viral loads, and close contact in enclosed spaces in accentuating the transmission and severity of infection have been documented.<sup>2,3</sup> The intervening quarantines and other public health measures which have been widely adopted have magnified the pandemic’s toll. The ensuing social and

<sup>1</sup>World Health Organization. (2021). Coronavirus Disease (COVID-19) Dashboard. Retrieved April 3, 2021, from <https://covid19.who.int/>.

<sup>2</sup>Pujadas, E., Chaudhry, F., McBride, R., et al. (2020). SARS-CoV-2 viral load predicts COVID-19 mortality. *Lancet Respiratory Medicine*, 8(9), e70.

<sup>3</sup>Cevik, M., Marcus, J., Buckee, C., et al. (2020) SARS-CoV-2 transmission dynamics should inform policy. *Clinical Infectious Disease*. <https://doi.org/10.1093/cid/ciaa1442>

economic difficulties have led to a worsening of preexisting health inequities.<sup>4,5,6</sup>

The Philippines, a lower middle-income country, has the highest income inequality in Asia.<sup>7</sup> Furthermore, it is the second most populous country (105 million) in Southeast Asia, following Indonesia. The national poverty incidence in 2018 was at 16.7%. The estimates of the number of those below the poverty threshold among urban and rural residents for the same period were at 5 million and 12.6 million, respectively. The poverty incidence among the elderly was at 9.1% (0.8 million individuals), while the rate for the disabled was at 14.7% (0.3 million individuals).<sup>8</sup>

Comparing with neighboring countries, the Philippines has the 28<sup>th</sup> highest rank in terms of the cumulative tally of COVID-19 cases. And while Indonesia has the most cases, the Philippines has the highest per capita incidence as well as mortality rates.<sup>9</sup> Reports from the early part of the pandemic indicated that the elderly and those from dense urban areas comprised the majority of COVID-19 patients requiring inpatient care.<sup>10</sup> Healthcare workers (HCWs) at one point accounted for a quarter of confirmed cases.<sup>11</sup> The government's response, in terms of travel, commerce, and physical distancing restrictions, has not been as swift as with other Asian countries, but it has subsequently been one of the most stringent and prolonged.<sup>12</sup> The initial COVID-19 testing capacity was limited, and was marred by controversies involving public officials subverting mandated priority rules.<sup>13</sup> The adverse financial, social, and health effects of the imposed lockdown have been severe especially for poor households.<sup>14</sup> Despite being an archipelago, the pandemic has spread rapidly especially in regional urban centers. Trends showed a progressive decline in COVID-19 cases following a peak incidence in

August<sup>15</sup> but another surge is wreaking havoc on the country's healthcare system as has happened in other countries following large gatherings and easing of restrictions as well as the emergence of more transmissible viral variants.<sup>16,17,18</sup>

## 2 | NECESSITY FOR COVID-19 VACCINE

There has been an unprecedented global effort to develop or identify effective therapeutic interventions for COVID-19. These have included research involving drugs, monoclonal antibodies, plasma therapy, and others. Several existing antiviral drugs have been repurposed and their use for COVID-19 has been part of several trials.<sup>19</sup> Nonetheless, no specific prophylactic or therapeutic agent or regimen has been definitively established. Currently, physical control measures -- with their regressive effects -- and supportive care for those requiring hospital admissions are the mainstays of infection control and treatment.<sup>20</sup>

Vaccines thus offer the most promising intervention, as these can potentially reverse the tide of the pandemic, and, by enabling herd immunity, eventually allow the resumption of unhindered community interactions. To date, 172 vaccines for SARS-CoV-2 are in various stages of development.<sup>21</sup> Several vaccines against COVID-19 have already been deployed for use in nearly three dozen countries, mostly under emergency use authorizations (EUA) following favorable phase 3 clinical trial results. Some countries have nonetheless opted to administer their own vaccines to their citizens prior to or while the corresponding clinical trials were in the early stages.<sup>22</sup> The Philippines has belatedly approved the conduct of a vaccine trial. As with newly developed therapies, the novel vaccines have not been tested in all population cohorts (e.g. children and pregnant women), nor have their long-term effects been established. Safety,

<sup>4</sup>Center for Strategic and International Studies. (2021). Southeast Asia COVID-19 Tracker. Retrieved January 3, 2021, from <https://www.csis.org/programs/south-east-asia-program/southeast-asia-covid-19-tracker-0>.

<sup>5</sup>Douglas, M., Katikireddi, S., Taulbut, M., et al. (2020). Mitigating the wider health effects of COVID-19 pandemic response. *British Medical Journal*, 369. <https://doi.org/10.1136/bmj.m1557>

<sup>6</sup>Xafis, V., Schaefer, G., Labude, M., et al. (2020). The Perfect Moral Storm: Diverse Ethical Considerations in the COVID-19 Pandemic. *Asian Bioethics Review*, 28, 1-19.

<sup>7</sup>Bonaccorsi, G., Pierri, F., Cinelli, M., et al. (2020). Economic and social consequences of human mobility restrictions under COVID-19. *Proceedings of the National Academy of Sciences*, 117(27), 15530-15535.

<sup>8</sup>Philippine Statistics Authority. Philippine Poverty Statistics. (2021). Retrieved January 3, 2021, from <https://psa.gov.ph/poverty-press-releases>.

<sup>9</sup>Index Mundi. (2021). GINI Index (World Bank Estimate)-Asia. Retrieved January 2, 2021, from <https://www.indexmundi.com/facts/indicators/SI.POV.GINI/map/asia>.

<sup>10</sup>Haw, N., Uy, J., Sy, K., et al. (2020). Epidemiological profile and transmission dynamics of COVID-19 in the Philippines. *Epidemiology & Infection*, 148, e204.

<sup>11</sup>Salva EP, Villarama JB, Lopez EB, et al. (2020). Epidemiological and clinical characteristics of patients with suspected COVID-19 admitted in Metro Manila, Philippines. *Tropical Medicine and Health*, 48(1):1-8.

<sup>12</sup>Financial Times. (2021). Lockdowns compared: tracking governments' coronavirus responses. Retrieved January 3, 2021, from <https://ig.ft.com/coronavirus-lockdowns/>.

<sup>13</sup>Concepcion, P. (2020, March 23). Gov't officials crowd out patients for COVID-19 testing. *Philippine Daily Inquirer*. Retrieved December 30, 2020, from <https://newsinfo.inquirer.net/1246714/govt-officials-crowd-out-patients-for-covid-19-testing>.

<sup>14</sup>Economic Policy Research Institute, UNICEF, UNDP. (2020). The Impact of the COVID-19 Crisis on Households in the National Capital Region of the Philippines. Retrieved January 3, 2021, from <https://www.unicef.org/philippines/reports/impac-t-covid-19-crisis-households-national-capital-region-philippines>.

<sup>15</sup>Department of Health. (2021). Covid-19 Tracker. Retrieved January 2, 2021, from <https://doh.gov.ph>

<sup>16</sup>Mat, N., Edinur, H., Razab, M., et al. (2020). A single mass gathering resulted in massive transmission of COVID-19 infections in Malaysia with further international spread. *Journal of Travel Medicine*, 27(3). <https://doi.org/10.1093/jtm/taaa059>

<sup>17</sup>Leung, K., Shum, M., Leung, G., et al. (2021). Early transmissibility assessment of the N501Y mutant strains of SARS-CoV-2 in the United Kingdom, October to November 2020. *Eurosurveillance*, 26(1), 2002106.

<sup>18</sup>Tegally, H., Wilkinson, E., Giovanetti, M., et al. (2020). Emergence and rapid spread of a new severe acute respiratory syndrome-related coronavirus 2 (SARS-CoV-2) lineage with multiple spike mutations in South Africa. *medRxiv*. <https://doi.org/10.1101/2020.12.21.20248640>

<sup>19</sup>Ahamad, S., Branch, S., Harrelson, S., et al. (2021). Primed for global coronavirus pandemic: Emerging research and clinical outcome. *European Journal of Medicinal Chemistry*, 209:112862.

<sup>20</sup>Won, J., & Lee, H. (2020). The Current Status of Drug Repositioning and Vaccine Developments for the COVID-19 Pandemic. *International Journal of Molecular Sciences*, 21(24), 9775.

<sup>21</sup>World Health Organization. (2020). Draft landscape of COVID-19 candidate vaccines. Retrieved December 30, 2020, from <https://www.who.int/publications/m/item/draft-landscape-of-covid-19-candidate-vaccines>.

<sup>22</sup>Bloomberg. (2020). Tracking COVID-19. Retrieved January 5, 2021, from <https://www.bloomberg.com/graphics/covid-vaccine-tracker-global-distribution/>.

particularly among the elderly, as well as efficacy issues have been raised regarding some of the vaccines.<sup>23,24</sup>

The Philippines has joined the COVID-19 Vaccines Global Access (COVAX) facility, through which it anticipates to receive vaccine supplies for 3% of the population initially, then possibly enough to meet 15% cumulative coverage later within the year.<sup>25,26</sup> The coverage figures correspond to approximately 3 and 16 million people, respectively. The government has only recently sought vaccines from other suppliers. Private entities and even local governments have arranged to separately procure vaccines.<sup>27,28</sup> Somewhat similar to the earlier controversies surrounding COVID-19 testing, questions have arisen regarding the covert administration of unauthorized COVID-19 vaccines to key public officials, presidential security personnel and even foreign workers.<sup>29,30</sup>

### 3 | VACCINE ALLOCATION BASES

Even as vaccines have already been introduced in several countries, including the Philippines, the available financing and logistical capacity are constrained to varying degrees in most settings. To compound access problems, supplies will have to be sourced from several manufacturers, as production outputs of each are still limited. Most of the lead vaccines have to be administered in two separate doses, which add to the complexity of their inventory and delivery requirements. Vaccines cannot therefore be expected to be made available to the majority of the population within an immediate and short time frame in many countries. A *laissez-faire* approach, whereby only the few who desire and are able to secure and pay for the vaccines, is, of course, possible. But this will not be an optimal arrangement. Only a limited number will directly

benefit, including those who may not even be at significant risk for infection in the first place, while transmission and the consequent health and social adverse effects persist for most. In economic terms, vaccines are therefore best considered as merit goods, and if access is left alone to individual entities or private enterprise, then market failures (and under-provision of vaccines) are to be expected.<sup>31</sup> The contention applies at the international level, where concerns on vaccine nationalism have been raised, as well as on a national level, where local enterprises and government units may crowd out national initiatives. The importance of an integrated and coordinated national government effort in the procurement, provision, regulation, and implementation of a COVID-19 vaccination program cannot be over emphasized.

Nonetheless, it is not only the efficiency of vaccine provision that needs to be attended to by the government. More importantly, particularly under circumstances of extreme shortage, there is a need to ensure the equitable allocation of limited vaccine supplies. The significance of equity for this health resource may be appreciated from several standpoints. From the public health and economics perspective, the inappropriate distribution of vaccines will translate to ineffective infection control, and will also contribute to diminished overall productivity.<sup>32</sup> Ethical principles, such as beneficence and justice, have been referred to in various vaccine allocation schemes.<sup>33,34,35,36,37</sup> Recognition has also been given to the existence of health inequities, wherein individuals, groups, and communities have been made vulnerable to worse health conditions and outcomes by prevailing unavoidable and unjust circumstances.<sup>38</sup> Vaccines and other health interventions have therefore been advocated to preferentially be directed to these sectors, lest existing inequities be further aggravated. Income as well as race-based schemes have been proposed, ostensibly to address not only historical disparities but also prioritize subpopulations found to be more vulnerable to developing severe COVID-19.<sup>39</sup>

<sup>23</sup>Mallapaty, S. (2021). China COVID vaccine reports mixed results – what does that mean for the pandemic? *Nature*. <https://www.nature.com/articles/d41586-021-00094-z.html>.

<sup>24</sup>Torjessen I. (2021). Covid-19: Norway investigates 23 deaths in frail elderly patients after vaccination. *British Medical Journal*. 372, n149. <https://doi.org/10.1136/bmj.n149>

<sup>25</sup>World Health Organization. (2020, August 24). 172 countries and multiple candidate vaccines engaged in COVID-19 vaccine Global Access Facility. Retrieved January 2, 2021, from <https://www.who.int/news>

<sup>26</sup>CNN Philippines. (2020, December 20). PH may secure 3% of its vaccine demand from COVAX pool next year – DOST. Retrieved January 2, 2021, from <https://cnnphilippines.com/news/2020/12/20/COVAX-facility-Philippines-coronavirus-vaccine-demand-DOST.html>

<sup>27</sup>Shira D. (2020). COVID-19 Vaccine Roll Outs in ASEAN & Asia – Live Updates by Country. ASEAN Briefing. Retrieved January 3, 2021, from <https://www.aseanbriefing.com/news/covid-19-vaccine-roll-outs-in-asean-asia-live-updates-by-country/#philippine-sHeader>.

<sup>28</sup>Caliwan C. (2021, January 5). Marikina, Mandaluyong set aside funds for Covid-19 vaccine. *Philippine News Agency*. Retrieved January 5, 2021, from <https://www.pna.gov.ph/articles/1126378>.

<sup>29</sup>Reuters. (2020, December 28). Philippines troops and ministers get COVID-19 vaccine before approval. *The Japan Times*. Retrieved January 4, 2021, from <https://www.japan-times.co.jp/news/2020/12/28/asia-pacific/philippines-coronavirus-vaccine/>.

<sup>30</sup>Senate of the Philippines. (2021, January 5). Statement of Senator Risa Hontiveros on reports that 100,000 POGO workers were inoculated with unauthorized covid vaccine. Press Release. Retrieved January 5, 2021, from [http://legacy.senate.gov.ph/press\\_release/2021/0105\\_hontiveros1.asp](http://legacy.senate.gov.ph/press_release/2021/0105_hontiveros1.asp).

<sup>31</sup>Chen, F., & Toxvaerd, F. (2014). The economics of vaccination. *Journal of Theoretical Biology*. 363, 105-117.

<sup>32</sup>Roope, L., Buckell, J., Becker, F., et al. (2020). How should a safe and effective COVID-19 vaccine be allocated? *Health economists need to be ready to take the baton*. *PharmacoEconomics Open*. 4(4), 557-561.

<sup>33</sup>World Health Organization. (2020). WHO SAGE values framework for the allocation and prioritization of COVID-19 vaccination. Retrieved November 20, 2020, from <https://www.who.int/publications>

<sup>34</sup>Persad, G., Peek, M., Emanuel, E. (2020). Fairly prioritizing groups for access to COVID-19 vaccines. *Journal of the American Medical Association*. 324(16), 1601-1602.

<sup>35</sup>McClung, N., Chamberland, M., Kinlaw, K., et al. (2020). The Advisory Committee on Immunization Practices' Ethical Principles for Allocating Initial Supplies of COVID-19 Vaccine—United States, 2020. *Morbidity and Mortality Weekly Report*. 9(47), 1782.

<sup>36</sup>Gayle, H., Foege, W., Brown, L., et al. (2020). Framework for equitable allocation of COVID-19 vaccine. *The National Academy Press*, Washington, DC. 10, 25917.

<sup>37</sup>Rid, A., Lipsitch, M., Miller, F. (2020). The Ethics of Continuing Placebo in SARS-CoV-2 Vaccine Trials. *Journal of the American Medical Association*. 325(3), 219-220.

<sup>38</sup>Whitehead, M. (1992). The concepts and principles of equity and health. *International Journal of Health Services*. 22(3), 429-445.

<sup>39</sup>Williams, D., Cooper, L. (2020). COVID-19 and Health Equity-A New Kind of "Herd Immunity". *Journal of the American Medical Association*. 323(24), 2478-2480.

## 4 | VULNERABILITY AND OCCUPATIONAL EXPOSURE

Vulnerability to infection is often equated with occupational exposure. HCWs, particularly those who directly care for COVID-19 patients, or even those who face inordinate risk from community transmission due to the demands of their work in other essential areas, intuitively fall in this category of the vulnerable. Protective equipment as well as public distancing measures have greatly helped limit transmission even in these sectors. However, the constancy of exposure attendant to their work, to which they remain committed due to either professional or economic constraints, translate to increased risks for both infection and transmission for these individuals. The latter situation, and the need to ensure their continued contribution to the overall functioning of society, is broadly acknowledged. As such, the primacy of HCWs and other frontline workers in receiving COVID-19 vaccines is uniformly accepted.<sup>40</sup>

Other individuals and groups within given populations have different circumstances. Some may be similarly vulnerable and, due to existing co-morbidities, are also more susceptible to infection.<sup>41</sup> Those who require repeated treatments in health facilities, such as dialysis or chemotherapy services, and even those who require prolonged hospital confinement, would fall under this category. These patients may get to interact with their family or community subsequently, and therefore additionally pose transmission risks. Those who have no choice but to live in overly crowded and unsanitary conditions, such as prisons and informal settlements, or those who have to stay with others who are readily prone to becoming infected, such as in elderly care facilities, may be difficult to protect from communal transmission and even severe disease. Still others, despite being susceptible to COVID-19 by virtue of either age, gender or poor health, may not really be vulnerable if they have the capacity to maintain isolation and observe other public health measures as well as not have any absolute necessity for community interaction.<sup>42</sup> The poverty incidence among the elderly in the country is below that of the national rate, suggesting that most of the elderly may have the same vulnerabilities, by way of restrictive economic circumstances.

Most allocation systems unequivocally give priority to generally defined sectors (e.g., HCWs, elderly, patients with co-morbidities).<sup>43</sup> These, however, are not necessarily attuned to the prevailing local contexts and circumstances. There are different demographic structures across countries, and the observed higher impact of COVID-19 on the elderly in high-income countries may not apply to

lower-income settings.<sup>44</sup> Therefore, an alternative framework that takes into consideration specific conditions and context of lower income countries, such as the Philippines is needed. The young and crowded conditions are associated with a greater burden of disease. Multi-generational households are also more common in many areas, and institutionalized care for the elderly is limited.<sup>45</sup> The same conditions, with the consequent altered risks for exposure and infection especially for the elderly, apply to the Philippines. In particular, crowding is most prominent in public transportation, which most low-income workers rely on especially in urban centers. While quarantine measures in the country have become less stringent, non-work-related travel and social interactions remain limited for adults, and still proscribed among children and the elderly. Workers therefore assume more risks for infection, and for also passing on the disease, particularly to elderly members of multi-generational households. The allocation system should also be responsive to the technical specifications of respective vaccines. Indonesia, for instance, has placed a lower priority for the elderly ostensibly because the safety of the available vaccine has not been established for this group.<sup>46</sup> Currently utilized vaccines have, aside from safety, been primarily evaluated their effectiveness in preventing severe disease.<sup>47,48</sup> Substantial reductions in the viral loads of patients who had confirmed infections following the initial vaccine dose has lately been reported, which is hypothesized to reduce transmission risks.<sup>49</sup> A more nuanced approach is thus needed, one that incorporates locally appropriate ethical perspectives as well as takes into consideration relevant technical and social concerns, if vaccine provision is to be made truly effective and equitable in the country.

## 5 | PHILIPPINE VACCINE FRAMEWORK

The Department of Health (DOH) has drafted a framework for the national deployment of COVID-19 vaccines, which has a three-year time frame.<sup>50</sup> Thus far, the stated primary goals of the program are to reduce COVID-19-related morbidity and mortality as well as maintain essential services. Its secondary goals are to control transmission and minimize social and economic disruptions. It draws

<sup>40</sup>McGuire, A., Aulisio, M., Davis, F., et al. (2020). Ethical challenges arising in the COVID-19 pandemic: An overview from the Association of Bioethics Program Directors (ABPD) task force. *American Journal of Bioethics*, 20 (7), 15-27.

<sup>41</sup>Kottow, M. The vulnerable and the susceptible. (2003). *Bioethics*, 17(5-6), 460-471.

<sup>42</sup>Peckham, H., de Grujter, N., Raine, C., et al. (2020). Male sex identified by global COVID-19 meta-analysis as a risk factor for death and ICU admission. *Nature Communications*, 11(1), 6317.

<sup>43</sup>Joint Committee on Vaccination and Immunization. (2020) Independent report: interim advice on priority groups for COVID-19 vaccination. Retrieved January 3, 2021, from <https://www.gov.uk/government/publications/priority-groups-for-coronavirus-covid-19-vaccination-advice-from-the-jcvi-30-december-2020>.

<sup>44</sup>Laxminarayan, R., Wahl, B., Dudala, S., et al. (2020). Epidemiology and transmission dynamics of COVID-19 in two Indian states. *Science*, 370(6517), 691-697.

<sup>45</sup>Moodley, K., Rossouw, T. (2021). What could fair allocation of an efficacious COVID-19 vaccine look like in South Africa? *Lancet Global Health*, 9(2), e106-e107.

<sup>46</sup>Widianto, S., Diela, T. (2021). Indonesia is vaccinating younger people first. Here's why. *World Economic Forum*. Retrieved January 20, 2021, from: <https://www.weforum.org/agenda/2021/01/indonesia-vaccinating-working-population-before-elderly/>.

<sup>47</sup>Polack, F., Thomas, S., Kitchin, N., et al. (2020). Safety and Efficacy of the BNT162b2 mRNA Covid-19 Vaccine. *New England Journal of Medicine*, 383(27), 2603-2615.

<sup>48</sup>Baden, L., El Sahly, H., Essink, B., et al. (2020). Efficacy and Safety of the mRNA-1273 SARS-CoV-2 Vaccine. *New England Journal of Medicine*, 384(5), 403-416.

<sup>49</sup>Levine-Tiefenbrun, M., Yelin, I., Katz, R., et al. (2021). Initial report of decreased SARS-CoV-2 viral load after inoculation with the BNT162b2 vaccine. *Nature Medicine*, 1-3. <https://doi.org/10.1038/s41591-021-01316-7>

<sup>50</sup>Department of Health. (2020). National Strategic Policy Framework for COVID-19 Vaccine Deployment and Immunization (draft). Retrieved January 5, 2021, from [www.doh.gov.ph](http://www.doh.gov.ph).

heavily on the WHO SAGE principles, even as these are not distinctly referred to as the ethical basis for the provisions. It thus subscribes to the same principles of human well-being, reciprocity, equal respect, and national equity. The identified priority groups are healthcare workers, senior citizens, indigents, and uniformed personnel. There are offices tasked with program monitoring, particularly for Adverse Events Following Immunization (AEFI).

The said framework, in many respects, falls short in terms of providing the necessary foundations for an optimal vaccine allocation system for the country. While the adopted principles and objectives may be said to be universal, other ethical dimensions, if not alternative interpretations of the same, that are more locally relevant could have been considered. The framework does not even designate any ethics body to participate in the planning and implementation of the vaccination program. It is worth noting that the DOH had relatively recently administered a failed dengue vaccine campaign, which did not undergo a prior ethics review. After having been rapidly administered to school children, it was subsequently determined that the vaccine was primarily indicated for those who already had prior dengue infection. Several children who received the vaccines died. As no serologic tests were done prior to the vaccination, attribution of the mortalities to the dengue vaccine, could not be dispelled. An immense public outcry followed, leading to widespread opposition to other vaccination campaigns.<sup>51</sup> The prioritized recipients for the COVID-19 vaccines cumulatively comprise nearly 23% of the total population, which greatly exceed the anticipated COVAX provision. Tellingly, a recent survey showed that there was only a 25% COVID-19 vaccine acceptance rate in the capital region, where there remains a relatively high incidence of infection.<sup>52</sup> Transparency is not a key principle of the DOH framework, despite calls for greater openness in the transactions related to the national vaccination program.

## 6 | ALTERNATIVE ALLOCATION SYSTEM

An alternative system is hereby proposed, which is anchored on more fundamental as well as more relevant ethical and social precepts. Where these are particularly important, related technical concerns are also highlighted.

### 6.1 | Ethical Values

#### 6.1.1 | Maximization of public health

In a public health emergency, public health goals acquire greater importance than individual health needs. During the current

pandemic, the control of transmission rises to the top of societal priorities. This does not mean that the health of individuals loses importance. However, there is a recognition that the protection of an individual's health depends on how well public health is protected in general and in the long run. Corollary, greater priority should be given to protecting a particular individual's or group's health when such protection has the effect of contributing more to the promotion of general public health through faster and more sustained control of transmission. The point is that the impact of resource allocation measures such as those relating to vaccines, primarily has to be measured in terms of how well it contributes to the control of disease transmission.

This is not to say that control of transmission and the minimization of harm – for example, the minimization of the number of deaths likely to result from COVID-19 infections – are mutually exclusive. On the contrary, the two are largely compatible. However, there are steps that may need to be taken to maximize the impact on the control of transmission while resulting in potentially greater aggregate harm to a number of individuals, mainly in the short run.

For example, it may be useful to give priority in vaccination to office-based workers over the elderly considering the much greater risk of increasing transmission in public transport when the unvaccinated non-elderly travel to and from their offices. While this may entail prolonging the period of risk for the unvaccinated elderly, the vulnerability of large numbers of commuting but non-elderly, office-based workers can be a strong argument for giving them vaccine priority over the former. This is not difficult to justify, especially if the elderly population under consideration have access to safe isolation facilities at home and they have no urgent reasons to expose themselves in crowded places without non-drug protection. While the elderly are more susceptible to severe disease or mortality, the vaccination of office-workers in their household is likely to have broader impact on the control of transmission because of their unavoidable physical interaction with others who are similarly situated. The positive impact of this measure can be expected to increase in proportion to the level of scarcity of vaccines that are available since the distribution of the vaccines has to be more nuanced in order to be able to address local outbreaks.

#### 6.1.2 | Minimization of harm

Serious harm to individuals brought about by SARS-CoV-2 obviously needs to be minimized, if not eliminated. Vaccination is meant to support this value, the importance of which can only be exceeded by the value of general public health in the event of a conflict, as explained above. Likewise, direct harm arising from the use of vaccines should also be avoided, or at least kept to the minimum, including among the elderly. There are also related ethical issues. There is a *duty to rescue* those who have greater exposure risks while performing essential work, more so when there are no other adequate or reliable means of protection. Likewise, there should be a *priority for the economically*

<sup>51</sup>Larson, H., Hartigan-Go, K., de Figueiredo, A. (2019). Vaccine confidence plummets in the Philippines following dengue vaccine scare: why it matters to pandemic preparedness. *Human Vaccines & Immunotherapeutics*. 15(3), 625-627.

<sup>52</sup>Baclig, C. (2021, January 5). Only 25% of Metro Manila respondents willing to get COVID vaccine – survey. *Inquirer.Net*. Retrieved January 6, 2021, from <https://newsinfo.inquirer.net>.

**TABLE 1** Proposed prioritization for COVID-19 vaccination

Priority	Sector
First Tier	<ul style="list-style-type: none"><li>• Frontline HCW &amp; non-HCW with co-morbidities, multiple exposures, and multiple interactions</li><li>• Patients requiring continued or regular health care facility care for medically significant conditions (with no medical contraindication for vaccination)</li></ul>
Second Tier	<ul style="list-style-type: none"><li>• Other frontline HCW &amp; non-HCW</li><li>• Those among the following who have limited personal protection or distancing means (e.g., crowded residences) and require repeated personal interactions (including use of public transportation):<ul style="list-style-type: none"><li>• Workers</li><li>• Elderly</li><li>• Patients with co-morbidities (with no medical contraindication for vaccination)</li></ul></li></ul>
Third Tier	<ul style="list-style-type: none"><li>• Other adults</li><li>• Children, depending on established vaccine safety</li></ul>

worst-off should be observed so as to concomitantly address existing health inequities. The economically worst-off are those who have a history of vulnerability to infectious and even non-communicable diseases due to economic circumstances that have not been given adequate societal attention. Owing to the same disadvantaged circumstances, they also have limited means of addressing COVID-19 or other health concerns in general. Thus, the availability of vaccines during the pandemic provides an opportunity to somehow make up for previous shortcomings.

### 6.1.3 | Reciprocity

This applies to members of society who have assumed the primary burden of risks associated with the direct response to the pandemic – such as HCWs and other essential frontline workers. This also involves the sharing of benefits with vaccine trial participants who assume the risks associated with the use of experimental vaccines.

### 6.1.4 | Transparency

Since the implementation of vaccine trials and vaccination programs require the utmost participation and cooperation of all, it is absolutely important that authorities keep all stakeholders properly informed about all aspects of the program as these are decided. The relevant information needs to be fully disseminated in a form understandable to all.

## 6.2 | Program Objectives

One should not confuse the *primary goal of the total COVID-19 effort*, which is reduction of morbidity and mortality, with the *primary goal of COVID-19 vaccination program*, which is control of transmission. While these two objectives are not mutually exclusive, as previously explained above, equitability in vaccine allocation needs to be understood in connection with the primary goal of vaccination. Vaccine allocation can only be made equitable if it is line with the latter goal.

Transmission can occur only from infected individuals, and is accentuated under certain circumstances.

The principle of equity entails giving everyone access to protection from COVID-19, but not necessarily to protection by vaccination. Insisting on equal access to vaccine protection at a point when vaccines are scarce, can go against the objective of fairly distributing effective protection as expeditiously as possible. As a result, the over-all effort to limit infections among those who are also most likely to get infected as well as transmit the disease can be slowed down and even rendered ineffective. At times, the way the benefits are distributed is given more importance than the maximization of outcome of the benefits distributed. Thus, what is to be fairly allocated is not the vaccine per se, but the benefit it provides.<sup>53</sup> The appropriate prioritization of recipients should therefore be premised upon this benefit, the curtailment of infection among the vulnerable as well as transmission to the susceptible. It must also be borne in mind that individual protection can be provided to the susceptible by means other than vaccination (e.g. wearing of masks, isolation, safe distancing), to the extent that the concerned individuals or groups have the capacity or support to sustain these.

## 6.3 | Allocation Priorities

The foregoing, together with due consideration of the best available scientific evidence, as balanced against on-the-ground feasibility and implementation flexibility, should be the basis for an equitable vaccine allocation system. It is further assumed that the national government will retain the lead for vaccine procurement and allocation. Likewise, existing public health measures, including graduated quarantine and isolation means as well as the corresponding official stratification of persons and firms, are to continue. With these in mind, an alternative prioritization scheme is thus proposed to provide guidance for a selective and phased COVID-19 vaccination program in the country (as summarized in Table 1). Prioritization refers both to timing as well as financial support,

<sup>53</sup>Wu, J., John, S., Adashi, E. (2021). Allocating Vaccines in a Pandemic: The Ethical Dimension. *American Journal of Medicine*. 133(11), 1241-1242.

such that those with higher ranks will get vaccines earlier as well as receive more subsidized provision.

#### Priority Groups

1. *People who, by virtue of their occupation or physical/medical condition, are repeatedly exposed to the risk of infection in healthcare settings.* These include persons who are indispensable to the vaccine implementation program.
  - a. *HCW frontliners.* Being at the frontline exposes them to highest risk. Their protection is essential to COVID-19 containment and, more specifically, the vaccination efforts. Protection given by vaccination also has a multiplier effect because these are the people expected to administer the vaccines.
  - b. *Non-HCW frontliners.* Although they are not professional HCWs, they are going to be indispensable to essential public or healthcare services, including support for the implementation of the immunization program.
  - c. *Non-frontliners but at-risk patients.* These are individuals who have underlying medical illnesses that require repeated or continuous care in health facilities and are therefore at risk, either during transport or actual care.
2. *Essential workers who are exposed to unsafe environments in line with their responsibilities.*
  - a. *HCW non-frontliners.* These are the HCWs who have to continue providing professional services personally in hospitals and clinics.

*Those who have to travel to work using public transportation or have to stay in crowded or exposed areas.* They may be distinguished from those who have the option to work from home. Having no private means of transport, they are forced to expose themselves to risk in public utility vehicles with inadequate physical distancing. Those who work in areas wherein public health measures are difficult to observe are also included. Within this group, higher priority is recommended for *people living in crowded dwellings with no facilities for isolation and/or hand washing.* Having very limited or no access to non-vaccine protection, they are exposed to a high degree of risk and if they become infected they also are in danger of infecting others. Giving them a high priority gives them needed protection as they continue to perform their essential services. The high priority also makes up for their traditional lack of access to societal resources.

*Note:* If Groups 2a and 2b are protected, they are also able indirectly to protect stay-at-home members of their families, including the elderly and those with underlying conditions.

3. *Those with underlying medical conditions, pregnant women, and the elderly.* Subject to adequate assessment particularly of the risks of vaccination, these patients may be vaccinated with corresponding precautions.

*Note:* Any member of this group who meet the criteria for any of the first 5 groups should be given the highest priority as a member of that group.

4. *Non-essential workers who have to travel to work using public transportation or work in exposed working spaces.* While their occupations may not have the same societal value as those in the preceding sections, these individuals nonetheless have to earn a living for themselves and their families and can be at risk for exposure in doing so. Public restrictions may be placed regarding their work resumption, but they will eventually need vaccines once supplies are available to enable them to have additional protection.
5. *Non-essential workers who do not have to travel to work using public transportation or work in exposed working spaces.* Being non-essential and having the option to work from home, these workers are able to control and limit their public exposure, thus ensuring safety also for stay-at-home household members.
6. *Children.* Putting children at this low level of priority assume that they are still covered by quarantine restrictions and are going to enjoy indirect protection because of the vaccination of adult household members. If they are going to be allowed out of the house then they should be given higher priority.
7. *All other groups*

## 6.4 | Implementation and Monitoring

The Philippine legislature recently passed the COVID-19 Vaccination Program Act of 2021.<sup>54</sup> It defines the roles of the national and local governments as well as private organizations in vaccine procurement and administration. It also established a National Vaccine Indemnity Fund, purposely to provide an insurance mechanism for AEFI cases. The official inclusion of the private sector is a tacit acceptance of the government's limited fiscal space as well as logistical capacity to obtain and efficiently distribute the vaccine requirements for the country. Nonetheless, the national government should attend to the provision of accurate and unbiased information, ensure the equitable distribution of vaccines, enforce voluntary participation, and monitor and address AEFIs. The role of the county's Food and Drug Administration (FDA) is crucial in regulating the introduction of safe and efficacious vaccines. The relevant vaccine information should be communicated in the best way possible to all the sectors of society. The prioritized groups should receive vaccines first, and these should be at no charge to the recipients. Every effort should be made to encourage, if not ensure, widespread vaccine coverage in accordance with the prioritization scheme. These should focus on positive strategies. Resorting to vaccine mandates may cause a resurfacing of the Philippines' dengue vaccine-related concerns and further undermine greater public acceptance. Thus, particularly as long-term effects are

<sup>54</sup>Congress of the Philippines (2021). Republic Act 11525: An act establishing the coronavirus disease 2019 (COVID-19) vaccination program expediting the vaccine procurement and administration process, providing funds therefor, and for other purposes.

still unknown, vaccination should be done on a voluntary basis and require an informed consent from recipients.


## 7 | CONCLUSION

Although a number of countries have their vaccine campaigns well underway, the Philippines' COVID-19 vaccination program has only just begun. While the delay is unfortunate, this also provides an opportunity to reevaluate the rapidly evolving vaccine landscape, particularly the potential for transmission control, and further consider the prevailing circumstances in the country. Various allocation schemes have been utilized in other countries. Given their apparent susceptibility to severe COVID-19, the elderly have been prioritized in many of the initial rollouts. We subscribe that for the Philippines and possibly other countries under similar circumstances, the elderly need not be given primary preference. In some respects, the recommended scheme is similar to what Indonesia has already undertaken. The rationale are different, however. Two types of vaccines were introduced only a few weeks' apart in the Philippines, unlike the reliance on a single option, with an undetermined safety for the elderly, early on for Indonesia. The primary focus has also been on prioritizing the vulnerable, which, for both countries, also equate mostly to the economically marginalized sectors. With the objective of mitigating both infection and transmission, giving higher priority to more vulnerable groups over admittedly susceptible individuals, provides an equitable basis for vaccine distribution under appropriate circumstances. The proposed COVID-19 vaccine allocation scheme is meant to be complementary to an effectively organized national program as well as the maintenance of concurrent public health measures.

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