



Security Nexus Perspectives

# ACHIEVING EFFECTIVE HERD PROTECTION WITH SARS-CoV-2: A STRATEGY TO PREVENT PUBLIC HEALTH AND ECONOMIC COLLAPSE

By Dr. Noel Lee J. Miranda \*

The main intention of lockdown, known in the Philippines as Enhanced Community Quarantine (ECQ), is to reduce the reproductive rate of SARS-CoV-2 transmission to a point near virus elimination, as demonstrated in the lockdown in Wuhan, China, and in other relatively successful countries.<sup>1,2</sup> Beyond the direct public health goal, strict lockdown measures towards total stamping out of the virus ultimately aspires to prevent public health and economic collapse, or prolonged societal devastation, which this pandemic is capable of causing. This article discusses strategies to harness the collective utility of proven tools and approaches.

This strategy relies on the principle of herd immunity, where the chain of transmission is broken when approximately 60% of the population is protected from infection or are rendered resistant or immune.<sup>3</sup> This is typically achieved through active or passive immunization. However, virus transmission may also be broken through other means, if the ability of sick people to infect others is reduced or inhibited, such as through physical distancing or separation, wearing face masks and shield, strict hand, oral and cough hygiene etc. Therefore, herd immunity is a function of the reduction of the reproductive number ( $R_0$  or  $R$  value)- the number of people an infected individual is able to also infect. Preventing person-to-person transmission, through all possible means, results in optimal herd protection. Herd protection as with herd

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\* Dr. Noel Lee J. Miranda, DVM, MSc, is a regional expert in emerging pandemic threats at animal-human-environment interface, pandemic preparedness and response, and multisystem operations planning. He was among the first veterinary public health field responders on behalf of WHO during the outbreaks of avian influenza in Southeast Asia in 2004. He facilitated ASEAN's pandemic planning in 2006-2013. Formerly a Senior Scientific Officer at the Research Institute for Tropical Medicine in the Philippines. He currently supports COVID-19 pandemic response efforts as a member of expert peer groups contributing national and global policy recommendations and technical guidance.

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immunity (at 60%) is expected to break the transmission chain, not only of SARS-CoV-2, but possibly that of influenza and other respiratory viruses as well.

The strategy needs to target specific segments of the population for better outcomes. In the Philippines, the “productive or workforce age group”- age 20 to 59 years old, has been identified to be the COVID-19-amplifying segment of the population. These people are the ones who leave their houses to go to work, then go home and infect other family members. An August 14, 2020 data showed that 113,914 (77%) of the 147,526 confirmed COVID-19 cases represented this critical target age group.<sup>4</sup>

The state of herd protection should be the aim of enforcing lockdowns. How then may this be approached, given the various tools and knowledge we currently have established over the time we have been in this pandemic? Below are strategies that harness the collective utility of the proven tools and approaches.

- 1) Enforce Zonal and Targeted Lockdown, targeting 60% of households to be physically distanced from the remaining 40%. Zonal refers to the location of economic activity. Sixty percent of persons frequently moving about within this zone should be in lockdown. The strict requirement is to achieve the 60% level. This 60% (lower or higher) may be decided collectively by a panel of experts. Within the zones are critical areas for stricter restrictions and monitoring, as well as where delivery of services needs to be ensured, e.g., main business/economic centers, crowded urban dwellings, and where families may frequently need to go out for essential supplies and services. These are areas where there are higher transmission risk and disease incidence rate. Zones would need to be designated and prioritized based on COVID-19 attack rates and the zonal R value; stricter restrictions are necessary when R values are greater than 1.
- 2) Selectively designate those to be included in the 60%- i.e., principally including the rotated workforce and households, based on the zonal economic activity location of the person designated (e.g., entire Luzon).
- 3) Sustain the lockdown for at least 24 days, based on the accepted 14 days of incubation/quarantine period for COVID-19, and the accepted 10 days of clearance from the onset of disease symptoms.<sup>5</sup> Thus, the critical parameters are: attain the minimum of 60% of people and 24 days of lockdown- or the “60-24 Rule”.
- 4) The 60+% level includes the most vulnerable population, and the 40% level includes the most immune. The most vulnerable refers to people with preexisting diseases, the elderly (>59 years) and the less than 21 years old age groups. The most immune refers to people who have recovered from COVID-19 (these people may need to be tested for neutralizing antibodies- NABs) and those who are determined to have adequate specific T-cell immune responses (if testing can be practically conducted).
- 5) The essential workforce may be rotated or a segment of which may be put in lockdown done rotationally, but ensuring that the 60% level is always being sustained. The method for this will

depend on the concerned establishment's circumstances. One example is to rotate staff based on passing the 24-day observation rule.

- 6) The entire zonal lockdown should be methodically executed and supervised/monitored.
  - a. This requires a detailed plan of execution, considering tools (e.g., app) for remotely tracking people (mobile phone-based location tracker) within the designated zone/s, etc. Movement restrictions should be set.
  - b. Within the 40% essential workforce and others engaged in essential activities, constant testing (this requires effective use of the home-based Rapid Antigen Testing), distancing, contact tracing, isolation, etc. must be methodically done. Supervision and in-house/self-policing would need to be imposed by all establishments.
  - c. Contact tracing and other public efforts can be better targeted to only those within the 40% allowed to sustain economic activities.
- 7) Households in lockdown that experience infection would need to be quickly identified and placed on extended/repeated isolation until the 24-day observation rule is ascertained. A quick-identification scheme is required.
- 8) All suspected COVID-19 cases within the 60% and 40% shall be quickly separated and tested.
- 9) Sustain all recommended public health measures at all times- physical distancing or separation, wearing face masks and shield, strict hand, oral and cough hygiene, etc.
- 10) Other rational means are to be considered, as these are determined to be effective or available. These include:
  - a. Regularly consuming omega 3 (or its food sources) and other fatty acids (e.g., lauric acid and monolaurin found in coconut oil). These have been touted to possess antiviral properties, directly, or indirectly by inducing high density lipoprotein (HDL) elevations. For instance, the three mechanisms proposed to explain the antiviral activity of lauric acid and monolaurin are: 1) disintegration of the virus envelope; 2) inhibition of late maturation stage in the virus replicative cycle; and 3) prevention of the binding of viral proteins to the host cell membrane.<sup>6</sup> The Philippine studies on coconut oil for COVID-19 are ongoing.<sup>6</sup> On the other hand, HDLs are believed to account for a significant portion of the antiviral activity of serum, which acts by preventing virus penetration. HDL may be one of the broadly antiviral defenses in the bloodstream.<sup>7</sup>
  - b. Vitamin D3 supplementation or sun exposure<sup>8</sup>; other nutritional supplements- vitamin C, zinc<sup>9</sup>, etc.
  - c. BCG vaccination for selected individuals (currently under investigation)<sup>10</sup>

- d. Potentially, an important approach to implement across the population is daily oral hygiene by disinfecting the mouth of COVID-19 cases as well as those that may be at high risk of infection. There are known agents that inactivate SARS-CoV-2 virus and are safe to regularly use orally, e.g., Povidone (PVP-I)<sup>11</sup> and coconut oil (lauric acid) by oil-pulling. Theoretically, it should prevent or reduce the rate of transmission or the R0; it prevents one from infecting or getting infected.
  - e. Use of passive (hyper-immune globulins) and active (vaccine) immunization to achieve the full benefit of combined approaches (once these are made available, even in limited quantities. It is projected that these will become available in the next 6 months).
- 11) Antigen-detecting Rapid Diagnostic Test (home-based Ag-RDT) should be widely distributed and done strategically within each household and workplace during the 24 days of lockdown, targeting a 10-day window for probable virus (antigen) detection; Day 5 (probable earliest onset of COVID-19) to Day 14 (latest onset point). However, testing of secondary household or workplace exposures would need to be properly targeted. Within the 10 days, testing can be every other day. Alternatively, asymptomatics may be tested just once from Day 5 to Day 10, which is the period of likely disease onset. People that show COVID-19/ILI symptoms are obvious suspects and should be tested on disease onset. Ag-RDTs are very specific (up to 100%), but it needs to be targeted in relation to disease onset to increase sensitivity (rated at >80%).<sup>12</sup> Positive results are definitely reliable.<sup>13</sup> If correctly performed and interpreted, Ag-RDTs could play a significant role in guiding patient management, public health decision making, and in surveillance of COVID-19.<sup>12</sup> If 50% to 60% of the population in hot spots took such a test every other day, the disease could be suppressed.<sup>14</sup>
- 12) The workforce is shared between private and public groups. The implementation of zonal lockdowns, according to the proposed 60-24 Rule, calls for all out private sector participation, from planning to supervision and constant monitoring. Private companies are expected to readily commit to the required 60% rotated lockdown, and be prepared to manage the process well. Government should harness private sector participation in keeping with the principles of the whole-of-society approach (WoS),<sup>15</sup> especially that the private sector is a major stakeholder in ensuring economic security.
- 13) While there had been notable achievements attributable to the ECQ, we continue to witness the occurrences of a number of disabling and contradicting elements whenever ECQ is imposed. Government and all stakeholders must identify and control these enabling or disabling elements.
- The enabling elements are actions or events that can make people stay home, or not be urged or pressed to go out for their essential provisions. Clearly, government needs to enhance its cooperative and participatory mechanism as it sustains ECQ.
  - The disabling elements are: 1) Actions or events that hinder the effective flow of essential supply chains, which the government says should continue. 2) Situations that will make people

gather in crowds, such as when needing to go to the market, and when claiming government handouts/aid. 3) Measures, such as COVID-19 movement inspections, that cause people and vehicles to congest in lines, and where potentially infected government inspectors would be contacting people.

- The strategy is to cut this movement of people out of households by instituting strategic essential goods provision, where there are designated times and places or means for families to get their essential supplies. And this should be methodically/systematically organized with whole-of-society support.

14) The following are key Lockdown Pointers:

- **People Protection:** At least 60% of the population should be constantly staying home, and strictly social distancing themselves. Each family should remain separated and protected as a unit- with no sudden introductions of members, and no visitors allowed. GPS and QR Code tracking should be maximized to track peoples' movements.
- **Perfect Policies:** Every effort must be taken to ensure social distancing. Things that break or contradict the "stay-home" and "social distancing" rules should be avoided by all means.
- **Personal Provisions:** Essential goods and services (e.g. food, supply, medical care) distributions and deliveries should be enhanced and must reach all communities; that communities have strategic access to these needs (e.g. door-to-door, online ordering, etc.). Public and private entities providing essential services should be fully supported, and their operations and supply chains must not be constrained in any way.
- **Peace-of-mind:** People-caring-participatory communication is the key to societal connectivity and cooperation. Essential services network should be well defined and understood by people. Families must know where, when and how to get food, medical help, emergency home maintenance needs, and other essential goods and services.
- **Public Welfare:** People and families who would have no livelihood should be quick targets for welfare, financial aid, and supplies allocation. This calls for unwavering assistance from all fronts.
- **Participation from all sectors:** Whole of society must support the above aims, with full engagement of private groups and NGOs, working together with government. For example, big corporations should organize community-based food and supplies deliveries (mobile marketing). Well-planned DISTRIBUTION of people in Time and Space is a key approach to effective COVID-19 transmission chain interruption. Provinces, cities and municipalities need to really work with each other, together with the private sector, to meet peoples' needs in the most organized way. For example, Zonal and scheduled assignments of marketing time and points should be organized. Malls could convert their big lobbies and function spaces into

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extended markets to best distribute people by Time and Space. Barangay halls, churches, basketball courts, etc., could also be converted. Large villages could convert their clubhouses and function halls into temporary goods and services depots.

This strategy requires effective planning, supervision and operationalization. Zonal lockdown implies that provinces, cities and municipalities would need to assume oversight, and work closely with whole-of-society stakeholders (i.e. whole-of-government, private groups and the academe), especially the private sector. Sectors getting involved in COVID-19 responses does not truly conform to the WoS approach. WoS entails mounting actions through a single command, following a single plan of action. It is about working together as one. Household and workforce monitoring, tracking, testing, contact tracing, and management of cases are clearly WoS tasks. COVID-19 is everybody's business.

While 24 days is the critical lockdown period, the planning and preparations that need to happen ahead of time are extensive, involving epidemiological evaluations, logistical arrangements, distribution of roles, community awareness and training/briefing the human resources required for close monitoring of households and imposition of the 60-24 rule restrictions. Governing Principles need to be set and be the bases of sound operationalization. An Expert Working Group should be assembled to initiate the entire process once a decision is made to adopt this strategy.

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