

COVID-19 Recommendations for Policy Makers

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I. THE CHALLENGE

COVID-19 is a rapidly transmitting disease requiring hospitalization in about 20% of cases, ICU care in 10%, and resulting in death in 2-4%. Complications rapidly increase for persons over 50 years old with comorbidities such as heart failure and coronary artery disease further increasing risk. COVID-19 can transmit even with mild symptoms (coughing, sneezing or elevated temperature) and perhaps before symptoms appear.

The COVID-19 outbreak has many more cases now than are visible (tip of the iceberg) and they grow rapidly:

- Absent the impact of sufficiently effective intervention, the daily multiplier is 1.5 (China 01/20-01/27, South Korea 02/19-02/22, Iran 02/22-03/03, and Denmark 02/26-03/09). So if you have 100 new cases today, the number of new cases you have in one week will be 1,700, two weeks 29,000.
- If you act to cut the multiplier down to 1.1, then if you have 100 new cases today, the number you have in one week will be 195, two weeks 380.
- If you act to cut the multiplier down to 1, then if you have 100 new cases today, the number you have in one week will be 100, two weeks 100.
- If you act to cut the multiplier down to 0.9, then if you have 100 new cases today, the number you have in one week will be 48, two weeks 23, and you will be well on your way to stopping the outbreak.

The rapid growth means that the number of cases seems unimportant until it all of a sudden overwhelms our ability to respond. This includes hospital beds and even the ability to maintain normal societal functions.

Due to the delay between transmission and symptoms, all prevention effects are postponed by around 4 days. Even if right now all citizens are encapsulated in sterile bubbles, the daily increase will still carry on for about 4 days.

People are connected by an invisible transmission network whose links are the physical contacts between individuals, the breathing of common air that can contain particles that are coughed, sneezed or even just breathed out and in, as well as between individuals and physical objects that can carry viral particles deposited on them and subsequently touched by others. This transmission network is operating all the time as we engage in normal activities. It includes both workplace/professional and personal contacts with family, friends and community members. How the network is connected among individuals determines the risk that an individual will contract the disease and transmit it to others.

The key to reducing the multiplier is radically pruning the network of transmission.

II. RECOMMENDED INTERVENTIONS

We call on government officials to take the following actions now:

- 1) Limit transportation from country to country, and between parts of a country, requiring at least 14 day quarantines for those transferring from region to region. A divide and contain strategy is essential.
- 2) Work with health institutions, businesses and academic institutions to rapidly ramp up mass testing to identify individuals for isolation. There are many labs in academia and companies that can perform tests and save lives.
- 3) Lockdown communities with active transmission, currently entire countries in Europe. Everyone except those providing essential services should stay home in these areas. Perform door to door search (with Personal Protective Equipment (PPE)) for cases, and need for services, with community involvement.
- 4) Encourage businesses to maintain essential functions and reduce impact on all functions using Safe-Space workspaces. This includes maximizing work from home to enable self-isolation and promoting Safe Spaces for individuals and families.
- 5) Increase medical capacity by converting public and private spaces to temporary hospitals for mild and moderate symptom cases to help separate the infected individuals from the rest of the population. Expand ICU capacity as rapidly as possible.
- 6) Monitor, protect and address the needs of vulnerable populations, including the homeless, and high-density facilities including prisons, nursing homes, retirement communities, dormitories, and psychiatric institutions.
- 7) Carefully reexamine medical resources and estimate potential shortages in the face of exponential growth in need. Begin to mitigate those shortages now. Stockpile essential resources, repurpose businesses to produce them, prioritize the protection of medical staff.
- 8) Actively cooperate with the global community on novel ways of intervention (such as South Korea's drive-through testing). This is a new and fluid situation, innovations are implemented and tested worldwide all the time.
- 9) Relax rules and regulations based upon "normal" experience that don't apply to the current conditions. Be nimble and proactive instead of waiting for a perfect solution.

Careful and transparent communications that promote public engagement are necessary as their active involvement in their own safety is essential.