

USING EXTENSIVE TESTING AND GEOGRAPHICAL ISOLATION TO MITIGATE THE CORONAVIRUS CRISIS IN HAWAII

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Hawaii needs to quickly adopt and implement a plan to control and then halt the spread of the coronavirus or the cost in terms of lives and damage to the economy will be catastrophic. The 1918 Spanish flu pandemic had an infection rate of 28% and a death rate of 2.5% for the infected population. If the coronavirus followed the same path in penetrating Hawaii's current population of 1.4 million, it would lead to 9,800 deaths. Before considering a specific plan, we lay out the roles of the federal and state governments in preventing an economic collapse and in controlling the pandemic. Given this general framework, Hawaii's chosen plan should then take into account the state's special characteristics that should give it some advantages in facing these challenges compared to states on the mainland.

The Shock to the Economy: What Can the State and Federal Governments Do?

As the coronavirus crisis explodes and lockdown measures quickly put much of the Hawaii economy to sleep, it is useful to remind everyone that the capacity of our state and local governments to offset a major economic crisis is extremely limited. Unlike the federal government, state and local governments cannot print money, and have limited borrowing capacity. During a crisis, state and local tax revenues also decline.

The total shutdown of Hawaii's tourism sector will slash state and local tax revenues from tourists and local workers. In 2019, there was a daily average of 249,000 tourists in our islands, paying the general excise tax of 4.5% on all goods and services and the hotel room tax of 10.25%. Revenues from these taxes will collapse in 2020. In addition, as the tourism and related industries lay off or furlough perhaps 120,000 workers, local incomes will decline causing revenue from the excise tax and the state income tax to drop. The state cannot easily maintain its current level of spending, without the revenue to pay for it. State policy makers have the ability to make changes in state programs that will speed recovery, such as moving already planned construction projects forward. But the overall effect of these types of adjustments will at most add a few thousand jobs. A state can borrow to cover a shortfall by selling bonds, but only if investors believe that a state can repay them from future revenues. Such a large decline in tax revenue will call the state's capacity into question, limiting borrowing, and it will be forced to cut expenditures, speeding the economy's decline.

What Congress does in the next few days and weeks will determine to a considerable degree whether there is a modest or major recession. The federal government has far greater borrowing capacity and can borrow very cheaply. Running a large deficit financed by U.S. Treasury bond sales, the federal government can assist the states by providing grants to fund programs to fight the virus and the recession, by providing loans to business, or by handing out checks directly to individuals and households. Already, the Federal Reserve has assisted by buying up the new Treasury bonds, but it may also help if it starts to buy state and local government bonds that would enable states to borrow more to maintain their expenditures. Many of these measures are unprecedented and require a political consensus across political parties and across states and regions to enact. A united Hawaii congressional delegation will help to make sure our voice is heard in Washington and that relief measures benefiting Hawaii are enacted.

Halting the Pandemic: What Can the Federal and State Governments do?

While the federal government needs to take a strong lead to offset the economic shock, the states need to take strong leads, assisted by the federal government, to halt the pandemic. It is critically

important for Hawaii governments to realize that the best way to restart the state economy is to implement effective measures to stop the spread of the virus as soon as possible and prevent its resurgence. First, stem the flow of new coronavirus infections into the state. The Governor's mandatory 14-day quarantine of all incoming travelers has already done this. Second, radically slow the rapid, invisible spread of the virus by a shutdown of economic and social activity for at least the 14-day incubation period of the virus and more realistically for several weeks. (Several weeks may be needed due to secondary transmission within families and violations of stay-at-home orders.) This is the goal of the shelter-in-place order issued this week by Governor Ige for Hawaii. Thirdly, once the danger of widespread transmission has been reduced by the shutdown but before the shelter-in-place order is lifted, a system must be in place for anyone with symptoms to be tested for coronavirus, quarantined until the results are back, and cared for and treated, if necessary. This needs to be coupled with expanded Department of Health capacity to quickly trace their contacts with others so they and their contacts can be appropriately quarantined and tested. This will allow the larger, uninfected population to go back to work.

Hawaii's geographic isolation presents us with a much better opportunity to accomplish the first task (outlined above) than mainland state governments. People in Hawaii don't normally think of geographical isolation as something positive as it imposes all sorts of costs on Hawaii's people. High shipping costs raise the prices of groceries, construction materials, and furniture. And, yes, toilet paper. Long flight times to cities in Asia and North America make it virtually impossible for international corporations to locate headquarters in our small market.

The coronavirus crisis presents Hawaii with a rare and unique opportunity to leverage its geographic isolation to its advantage. Eight islands separated by 2,400 miles of ocean from the next big city (San Francisco) provide the state government with the ability to effectively seal the state's borders to all infected non-residents. Equally as important, state government can also tightly restrict travel between the eight islands and then work on resolving this epidemic separately on each island.

The ability to isolate Hawaii's eight islands is critical for our response to the coronavirus crisis because it provides the necessary conditions for the Hawaii state government to focus exclusively over the next few months on the health of Hawaii residents and not worry about new arrivals who carry the disease circulating among the population. This ease of border control would allow public health authorities to follow the methods successfully used by governments in Taiwan and Singapore—*islands*—and South Korea, a peninsula with a single sealed land border with North Korea, to control their outbreaks. Once isolating and controlling the entry and general spread of the virus, their approach has focused on testing anyone with respiratory symptoms or having concerns about potential contact with the virus. When someone is found to be infected, they are isolated, cared for, and treated until the disease has run its course and their contacts are proactively followed and tested. The result: Singapore and Taiwan have had relatively few cases, while after an initial large outbreak South Korea has been able to markedly reduce the number of new infections. Note also that Hawaii would not be the first government to impose a quarantine for all arrivals at its border while still retaining trade connections to other countries and states. Peru, Australia and New Zealand have closed their international borders to all non-residents and are imposing strict quarantines on returning residents. The United States has closed its airports to almost all passenger traffic from Europe.

A Sketch of a Plan for Hawaii

Let us sketch out a possible plan for control of the virus in Hawaii. The plan is loosely based on the successful responses to date in places like Singapore and Hong Kong and considers our current epidemic status in Hawaii and our unique situation. This plan has four steps: 1) stem the influx of new infections; 2) rapidly slow the spread of the epidemic in the local population; 3) once the spread has stopped, conduct wider testing of those with symptoms and at elevated risk and proactively trace contacts of any who are

positive; and 4) based on active monitoring of the testing done set triggers to reimpose shelter-in-place orders if the epidemic resurges.

Hawaii has three very different circumstances that would facilitate effective implementation of a control plan based on wider, but targeted, testing and contact tracing after arresting widespread transmission: Our geographic isolation, our small population (1.4 million people), and the very small numbers of governments (4 counties and 1 state government) across which actions would need to be coordinated. The first step in implementing an effective control plan in Hawaii has already been taken, as the state government has imposed a mandatory 14-day quarantine on all incoming travelers and has moved to tightly restrict inter-island travel. The second step has also already been taken, as Governor Ige has imposed a state-wide lockdown to slow transmission of the virus between individuals and reduce the burden on the state's health care providers from very sick individuals requiring intensive care. The third step is the most challenging and is still pending: at some point during the lockdown, state government should rapidly implement a plan to expand availability of testing in each of the four counties, routinely test all individuals with respiratory symptoms or fevers for coronavirus and proactively trace the contacts of all found infected with coronavirus. This should be coupled with widespread availability of testing for anyone concerned about possible exposure. Test results would allow the government to enforce isolation of ill people until the disease ran its course. For most people with the virus, this would be 2-3 weeks, a period short enough to allay most (but not all) concerns about restrictions on civil liberties. We note that 500 tests per day are now being done in Hawaii, which on a per capita basis is about the same as in South Korea. Thus, expanded testing would be building on an already substantial base. The fourth step would require agreement between health professionals and civil authorities on what the surveillance-based triggers for restoring shelter-in-place orders would be.

Once individuals with the virus have been isolated, the state could lift the shelter-in-place order for healthy and recovered individuals, thereby allowing most of Hawaii's population to get back to work, resume their education, and engage in valuable social activities. Those more vulnerable to the virus, e.g., the elderly or those with pre-existing risk conditions, and those in close contact with them would still be encouraged to stay in isolation until the threat has truly passed. While the lifting of the state quarantine would not allow the tourism sector to restart, it would allow the rest of the state economy to resume business. Contrary to conventional wisdom, the non-tourism part of the state economy amounts to about 77% of Hawaii GDP (i.e., annual output of goods and services). Tourism accounts for about 17% of state GDP in 2018, with induced "multiplier" income created by this sector amounting to 6% of GDP. Restoring 77% of the state economy would be a huge step forward from the lock-down period, in which overall output will probably be reduced to 40-50% of 2018 levels.

When could tourism resume? To some extent, the answer is out of our control, as it depends on those U.S. states and countries that usually send tourists to Hawaii bringing their coronavirus epidemics under control. Alternatively, tourism might also resume when a new, quick test can be given to air travelers at their home airports before getting on the plane. When such a test becomes available and Hawaii brings its epidemic under control, tourism might spring back relatively quickly. This is because tourists would be more willing to visit a destination that has controlled its epidemic and ended its lock-down.

There are four major obstacles to implementing a widespread testing and surveillance program in Hawaii. Overcoming them will require a large and sustained commitment of will and resources by public and private partners. First, state and county governments would need to enforce a near total lock-down of the state's population for the initial period while the necessary testing and contact tracing capacity is built. This would require both state and local governments to ensure these orders are being followed. The Department of Health would need a major infusion of resources and personnel. Second, the state would need to find resources to pay for the cost and infrastructure necessary to conduct much more widespread testing and

contact tracing in the state. Given the FY2019 state budget of more than \$14 billion, the resources could be found, even if tax revenues are rapidly shrinking. (Some costs of testing might be covered by public and private health insurance plans, while building laboratory capacity should be seen as an investment for the future.) Third, it requires coordination between city and county governments and the U.S. military to make sure that all Hawaii residents in need of tests, including members of the armed forces, receive them. There are logistical challenges, such as where and when to conduct testing and how to build lab capacity, that would be resolved much easier if Hawaii governments and the military cooperate closely in crafting responses. Hawaii residents are familiar with multiple examples where our governments fail to coordinate, yet in an emergency a small number of governments has lower costs of cooperating than do a large number of governments. They would hopefully choose to work closely together.

Finally, could the state and private partners locate enough tests over the next five weeks and identify sufficient personnel resources and laboratories in Hawaii to process the necessary volume of tests? The answer to this is probably “no” if we just look to approved FDA products produced in the United States. This could change if the federal government decides to make use of the Defense Mobilization Act to try to force increased production of tests and equipment to process them. But if we expand horizons to buy tests overseas (think the tests already in use in Korea) and to develop additional sites for processing tests (think UH laboratories, Diagnostic Lab Services, and Clinical Lab Services), we may well find that the plan discussed above becomes both feasible and effective. Consider that the County of Los Angeles just contracted this week with a Korean firm to provide it with 100,000 test kits per week. If LA County can do this, so can the State of Hawaii. Implementation of a more nuanced version of the plan sketched out above would allow the state’s epidemic to be stopped in its tracks and restore much of the state’s economy sooner than under a long-term lockdown.

Nothing is certain in the current economic and political environment as the coronavirus pandemic sweeps across the globe. This is because our ability to construct rational responses to the pandemic is limited by our thin and rapidly changing knowledge of the disease’s epidemiology. Andrew Atkeson, an economist at the Federal Reserve Bank of Minneapolis, applies a simple model of an epidemic to this pandemic “to ask what happens if extremely severe mitigation efforts are imposed on a temporary basis (for a few months) and then gradually relaxed. The model predicts that once mitigation efforts are relaxed, the disease simply restarts its rapid progression and sweeps through the population in less than 18 months, reaching its peak infection rate about 450 days from now.” Atkeson’s simulation results make it clear that if a state relaxes severe shelter-in-place policies “too soon,” the epidemic could quickly re-emerge. His results provide a warning to policy makers that they need to be willing to adapt their chosen policy model as we learn more about the coronavirus. To cope with the potential for re-emergence after lock-down ends, the State of Hawaii should announce that it will impose a new lock-down period if new infection rates rise above a pre-specified level. Ready availability of testing would make such a policy commitment more credible.

The good news for Hawaii is that we face conditions more favorable to the pandemic’s control than other states. Our situation is not unlike that in Singapore, Taiwan and Hong Kong which have successfully controlled the epidemic so far, but know they must remain vigilant to avoid a resurgence. We have much to gain if the state government acts quickly to adopt and implement a transparent plan to control and then halt the spread of the coronavirus.

The views expressed in this article are those of the authors and do not represent the views of the East-West Center or the University of Hawaii.

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