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# The Coronavirus and Lessons for Preparedness

*Joshua R. Hendrickson*

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In the midst of a pandemic, the most pressing issues are those of containment and mitigation—both in terms of the virus itself and the economic costs. However, it is also in the midst of a pandemic that one can learn important lessons about preparedness for possible future pandemics.

The difficult thing about pandemics is that they require hospitals to be capable of expanding capacity rapidly and significantly. Certain resources are easy—at least in theory—to mobilize. For example, hospitals can, to some extent, reallocate empty beds, floor space, and nurses to accommodate an influx of new patients. However, such diversions are all for naught if the necessary equipment to treat these patients is unavailable. Ventilators for patients, as well as masks and other protective gear for doctors and nurses, are critical for keeping patients alive and keeping doctors and nurses healthy so that they can care for those patients. Government should subsidize industries so that they produce additional quantities of this kind of equipment during noncrisis times in preparation for a possible pandemic.

Ramping up the production of these critical goods might be difficult. Greater production per unit of time means that producers will face higher costs of labor and other inputs. These costs will be passed along to hospitals or the government, should it engage in financing these purchases. Physical limits on the "time to build" in production are also a crucial constraint in the midst of a crisis.

Given the need to ramp up production, policymakers need to use lessons from this pandemic to prepare for the future. Fortunately, policymakers can use a little economic theory, as well as lessons from historical crises, such as wars.

In the 1970s, UCLA economist Earl Thompson presented a model explaining why national defense–based arguments for subsidies to certain industries were rational and efficient.[1] His argument was

that governments often impose rationing and price controls during wars on particular types of goods. Because the firms that produce these goods know this, they tend to underinvest. He argued that a rational response to this problem is for the government to subsidize industries affected by these policies in peacetime to prevent such underinvestment. In other words, during peacetime the government should compensate the industries that bear the policy-induced costs during wartime. Thompson's examination of subsidies in the United States confirmed this predicted pattern.

In my own work, I have pointed out that a similar argument applies for industries engaged in the type of production that is complementary to national defense.[2] During peacetime, the military operates at a lower capacity than it would during a war. When war begins, the military has to be able to dramatically increase its capacity. Certain industries, such as shipping and airlines, are complementary to defense because they are capable of providing sealift and airlift for the military during times of war or other emergencies. Nonetheless, if these industries expect that the government is going to divert their assets for military use during such times, they will tend to underinvest. As a result, the US government provides peacetime subsidies to these industries in exchange for their services during times of war and other emergencies. In short, there are gains from trade between the US military and the shipping and airline industries during times of war. However, rather than waiting for war to break out to attempt to strike an agreement, the US government has an explicit policy that outlines the terms of the agreement.

Policymakers need to recognize that the same economic logic applies during a pandemic. When a pandemic occurs, the demand for medical supplies such as masks and other protective equipment for healthcare workers and ventilators for patients necessarily increases. The excess masks and ventilators that the hospital has on hand before the pandemic are quickly used up. One solution would be for the government to provide subsidies to firms that make the products used in intensive care during noncrisis times, perhaps through direct purchase and storage of these goods, so that the country is prepared when faced with a possible pandemic. This solution would require the government to maintain a stock of N95 masks, isolation gowns, eye shields, disposable gloves, ventilators and ventilator supplies, oxygen masks, suction equipment, ECMO machines, dialysis machines, feeding tubes, glucometers, and urinary catheters. While the US government has attempted to embark on similar measures in the past, it has never followed through with a comprehensive plan or proper replenishment.[3]

Preparedness is not limited to supplies but also extends to domestic productive capacity. A comprehensive program would require consulting medical professionals to determine everything that is necessary for pandemic preparedness. In the aftermath of the current pandemic, the government should put together a committee of medical professionals and industry experts to determine a comprehensive list of goods that are needed in a pandemic, but for which the time to build is lengthy or ordinary market activity does not create sufficient capacity to ramp up production over short periods of time or for which domestic production capability does not currently exist.

In general, the objective of these policies is to rapidly scale up US capacity to provide intensive care to its citizens in the face of a pandemic.

These policies are not without precedent. The US government already has initiated these types of policies. For example, the production of vaccines requires the use of chicken eggs. When vaccines need to be produced rapidly, this imposes an important constraint on production because the number of eggs available is limited by the number of hens and the fact that each hen only lays approximately one egg per day. A country of 300 million people will either need to have a lot of hens or have to wait a long time before a sufficient number of vaccinations are available. Of course, hens are typically raised for purposes that are not related to the production of vaccines. From a social perspective, since pandemics are low-probability events, the market tends to underprovide hens and eggs. As a result, the Biomedical Advanced Research and Development Authority (BARDA) within the Department of Health and Human Services uses federal contracts to ensure that there is a sufficient supply of eggs available in case of a pandemic.[4] These contracts ensure that there is the economic capacity to develop a vaccine without having to divert resources during a crisis.

Some might worry that the sorts of policies being advocated here might lead to rent-seeking behavior, with many companies arguing that their products are crucial to fight a pandemic. The term "rent-seeking" refers to the attempts of firms and industries to try to acquire the benefits of the subsidy without actually contributing anything of value to the program. As with any government subsidy, there is little doubt that some degree of rent-seeking would occur. Industries might petition for subsidies and lobby to be designated as crucial. Therefore, this policy approach requires limits, rules, and transparency measures that guard against the problems that arise from government-granted subsidies. Nevertheless, the relevant question is whether the benefits of the subsidy program would be greater than the costs, inclusive of rent-seeking. Some back-of-the-envelope calculations would seem to suggest that rent-seeking would be a minor concern.

For example, suppose that there will be one additional pandemic from now until the end of time. How much would the United States be willing to spend on an annual basis to be better prepared? To get a sense of the willingness to pay, suppose that this pandemic would result in the deaths of 1 percent of the US population. Given the current US population, this amounts to approximately 3 million deaths. Now suppose that, of these deaths, only 2 percent could have been saved from better preparedness. This amounts to 60,000 lives saved from preparedness—a very conservative estimate given that deaths could spiral out of control owing to a lack of preparedness. Using the value of a statistical life of $9 million, this number of lives saved would imply a value of $540 billion from better preparedness.[5] Using a discount rate of 3 percent, the average annual cost of such a program, including rent-seeking, would have to exceed $16.2 billion from now until eternity to offset the benefits.[6] And even that estimate assumes that only one pandemic ever occurs and that the total number of lives saved is a small fraction of all possible deaths. The actual costs of purchasing and storing supplies and equipment are likely to be low on an annual basis because

most of the cost is related to storage and periodic replenishment. Thus, it seems that the costs of rent-seeking would have to be pretty substantial for this program not to pass a cost-benefit analysis. Other policies, such as subsidies to encourage domestic production, might be more of a target for rent-seeking. However, the government could potentially prevent rent-seeking for candidate firms by imposing price controls on these firms during pandemics.[7]

It is time to recognize that policies designed to create preparedness for war offer potential lessons for preparing for a pandemic. Like wars, pandemics require a quick and substantial increase in capacity. Similar to how militaries must be able to quickly scale up their capacity, pandemics require that hospitals be able to scale up their capacity to provide intensive care. In order to scale up the military quickly and effectively, the government provides peacetime subsidies to particular industries in exchange for their services or sacrifices during wartime. The US government has already taken similar actions for the production of vaccinations during a pandemic. However, the government needs to go further so that hospitals are capable of scaling up intensive care capabilities.

The costs are likely to be modest relative to the federal budget. BARDA pays approximately $57 million per year to secure a sufficient egg supply for vaccines. This amount is comparable to a rounding error in the federal budget. Since some items for pandemic preparedness are storable, they would entail much smaller periodic expenditures and likely modest storage costs. In addition, these costs are likely to be substantially lower than the costs paid in the midst of a pandemic, when governments would have to pay elevated prices. And that is not to mention the cost of the unnecessary loss in human life that could have been prevented through better preparedness. The cost of these lost lives is likely to swamp the cost of the subsidies as well. Thus, compared with the relevant counterfactual, these preparedness subsidies would not only better prepare the United States for future events, but they would be less costly than the status quo over the long run. Finally, drawing lessons from war preparedness would better prepare the United States not only for pandemics, but also for the potential of biological warfare and similar threats.

## ABOUT THE AUTHOR

Joshua Hendrickson is an associate professor of economics at the University of Mississippi and a senior affiliated scholar at the Mercatus Center at George Mason University.

## NOTES

1. Earl A. Thompson, "An Economic Basis for the 'National Defense Argument' for Aiding Certain Industries," *Journal of Political Economy* 87, no. 1 (1979): 1–36.
2. Joshua R. Hendrickson, "U.S. Maritime Policy and Economic Efficiency" (working paper, November 2019).
3. Beth Reinhard and Emma Brown, "Face Masks in National Stockpile Have Not Been Substantially Replenished since 2009," *Washington Post*, March 10, 2020.

4. Public Health Emergency, "BARDA Funds Year-Round Egg Supply for Pandemic Flu Vaccine: $57 Million Contract Supports U.S. Pandemic Preparedness as New Technology is Developed," *HHS News*, October 8, 2010.

5. Note that, assuming that the value of a statistical life grows at a rate equal to the discount rate, $540 billion is both the current value and the present value.

6. The discount rate in this calculation can be thought of as the cost of borrowing, or the long-term real interest rate. Macroeconomists typically calibrate this at 4 to 5 percent. However, given recent trends in interest rates, I have used a more conservative estimate of 3 percent.

7. As a point of comparison, subsidies to domestic shipping companies for participating in the Maritime Security Program are approximately $3 million per ship per year in exchange for mandatory service during wars and other national emergencies. Thus, even programs designed to support domestic production of particular goods needed in a pandemic are likely to be of similar magnitude (i.e., millions rather than billions of dollars) and much lower than the back-of-the-envelope cost estimates.