

# Optimal Action Delphi Process Summary Report January 2021

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## SUMMARY

An expert consensus ranked a national stay at home order with financial compensation for lost wages as the most effective intervention to slow the spread of SARS-CoV-2 and the burden of COVID-19. Experts reasoned that the US may see a surge in cases with the presence of new variants like B.1.1.7, that testing and contact tracing are most effective when a population is under quarantine, and that decreasing the frequency of contact between individuals will slow the spread of disease. Though, experts did comment that this may be a difficult intervention to implement in the US due to sociocultural and economic factors.

The second most effective intervention proposed by experts was to increase the rate of vaccination by opening new locations to provide a vaccine or expanding the hours of vaccination centers, making it easier to register for a vaccine, adopting methods of vaccine delivery proven to be effective in other countries, and placing priority on a first dose over second dose. The most frequent reason for an increased rate of vaccination, given by experts, was that a small percentage of distributed vaccines to date have been used to inoculate the US population.

The third most effective intervention proposed by an expert consensus was to impose a mask mandate, an enforceable requirement that the population wear masks when interacting in a public place. Experts reasoned that masks are known to effectively reduce the transmission of viral particles from one infected person to another.

The fourth, fifth, and sixth most effective interventions were, in order, to increase the frequency and availability of COVID-19 tests, to design a coordinated and single response to mitigating COVID-19, and to prioritize masking essential workers.

Experts also proposed interventions that may be important to highlight for public health officials. One expert proposed a novel vaccine strategy that prioritizes essential workers and a single person from each household designated to “run errands” (i.e. interact with the general public). A second expert proposed local stay at home orders for regions that are experiencing high infection rates that allows the number of residents who are vaccinated to increase while decreasing potential exposures to the virus.

The interventions by an expert consensus highlight the need for a nationwide, coordinated effort to prevent the further spread of SARS-CoV-2 and place an emphasis on limiting exposure or taking action to protect against exposure to the virus. The feasibility of interventions (cost, adherence to interventions, etc.) was taken into account but not prioritized among this expert consensus.

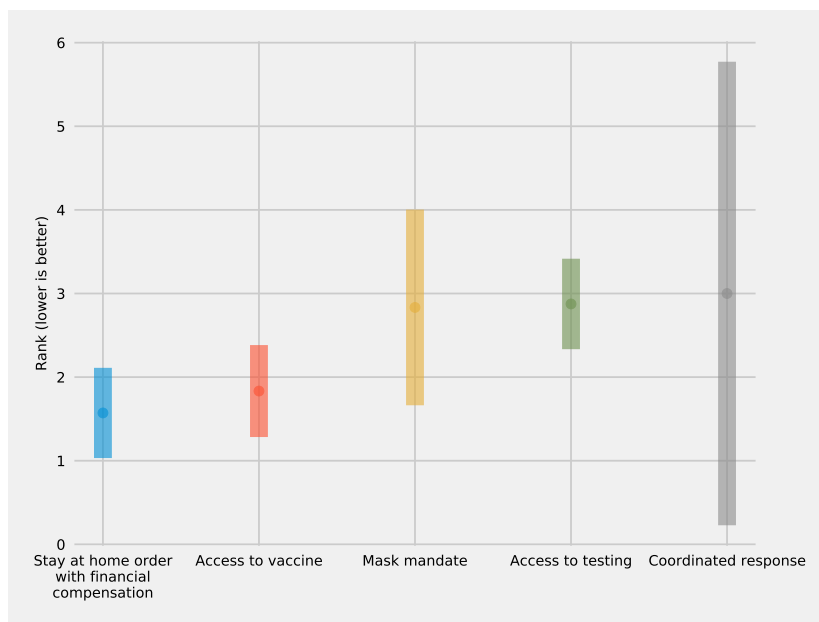


FIG. 1: The mean and 95CI rank assigned to intervention topics by subject matter experts. The best possible rank is one and the worst rank is five.

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## Methodology

Effective interventions were aggregated using the Delphi process—a technique to generate a behavioral (as opposed to a mathematical) consensus by allowing a group of experts to come to a consensus through iteratively proposing and revising ideas.

For this project, there were two phases to the Delphi process.

In Phase I, experts were asked to submit the top 5 most effective interventions and a rationale. Experts were asked to rank the intervention/rationale they felt was most effective (rank of 1) to the least effective (rank of 5). Experts were asked not to speak to other members who participated in the Delphi process, and they could submit interventions from 2021-01-07 to 2021-01-15.

After Phase I the interventions and their rationales were collected into a single document to present to experts in Phase II. Interventions and their corresponding rationales were kept anonymous and grouped by their rank. For each group of interventions the order they were presented in was randomized. This prevented a single expert's set of interventions from appearing in the same position. In addition to a document that listed all interventions ranked by effectiveness, we also created for each expert a document that listed the interventions they proposed in Phase I.

In Phase II, experts were presented with the document of all ranked interventions and their personal list of interventions, and asked to resubmit what they felt would be the top five most effective interventions and corresponding rationales. Experts were encouraged to read over the collective document and, if possible, to copy over the exact text from interventions in Phase I when appropriate. Experts were asked to submit interventions from 2021-01-21 to 2021-01-28.

The final set of proposed effective interventions were categorized into the following 11 topics: “Stay at home with financial compensation”, “Stay at home local”, “National Mask Mandate”, “Access to vaccines”, “Access to testing”, “Coordinated response”, “Contact tracing for B.1.1.7”, “Increase masking of essential workers”, “Sero study”, “Close indoor non-essential businesses”, “Other” and this summary document was produced.

An effective intervention was defined for experts as one that “requires few resources, can be implemented fast, and is most likely to lead to behavioral changes that reduces the incidence of cases and deaths due to COVID-19.”

## Data

De-identified interventions, their corresponding rationales, the assigned topics, and their ranks for the eight experts that participated in this Delphi experiment are in the supplement to this document, and will be made available in a dedicated GitHub repository, and on the Harvard dataverse (URL upcoming).

## PHASE II REPONSES

### The most effective interventions and a rationale

Mask mandate in public places and increased availability of surgical masks

Masks are known to be very effective in reducing infection events and disrupting transmission chains.

Above and beyond any individual intervention it will be key to have a coordinated response to avoid a patchwork of places with interventions and those without.

Recent work has shown that non-uniform implementation of interventions can lead to individuals who are noncompliant to the intervention moving and increasing spread across areas. For example if bars/churches/gyms/etc are closed in county A but open in county B individuals may (and do) move from A to B potentially spreading to county B or being infected in B and transmitting it to A.

A national stay-at-home order \*with financial compensation for wages lost\*

With B117 now in multiple states it is likely that we will see a considerable surge in cases during a period of growth that is \*already\* exponential in many locations. Though stay-at-home orders are not sustainable in the long-term

financial compensation for wages lost may make its use more feasible as a short-term stop-gap measure during unprecedented periods of transmission. With appropriate planning and foresight I believe that the Biden Administration is capable of putting into place such a measure.

Reiterating:

"Lockdowns" with fully supported paid time off for all residents.

All current testing/contact tracing quarantine and isolation schemes assume persons have the resources needed to self-isolate or self-quarantine; true "stay at home" is essential to get the national epidemic to a state where distancing/contact tracing can be effective.

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Improve the efficiency of creating a vaccinated population including prioritizing all essential personnel and one person per household who can run errands. This may involve a combination of making it easier to register for vaccines and calling people on the waitlist when there are no-shows to ensure no vaccines are wasted; employing additional people to administer vaccines; or adopting practices from vaccine campaigns in other country for other diseases.

It is important to reduce the number of people who will suffer (hospitalizations deaths etc) from COVID-19. If one person per household is vaccinated it will be much easier to keep vulnerable people safe. This assumes that vaccinated people are not only less symptomatic but also less likely to transmit it most likely because of a smaller viral load but also because they will cough less.

Coordinated comprehensive mandatory facemask requirement (N95 or surgical as much as possible) with strong enforcement and penalties for non-compliance. Possibly coupled with a concerted education/outreach campaign (yes the mask does need to cover the nose!).

Masks work against any COVID strain properly worn they are incredibly effective they are fairly cheap a lot of business and schools can remain open we have enough masks to implement it.

Increase the rate of vaccination by opening new locations and/or expanding hours for vaccine administration.

A small percentage of distributed vaccines have been used. Increasing the actual administration of these vaccines is critical for slowing the spread of the epidemic.

### **The second most effective interventions and a rationale**

Rapid paper-strip antigen testing made cheaply available to individuals and encouraging people to take the tests 1-2 times weekly.

The technology exists and these tests are already being produced at large scale in the US but sent overseas. Infectiousness reaches its peak just prior to or at the onset of symptoms making it necessary for testing to catch infectious individuals before they spread infection to others. We don't need to stop all infections but this sort of testing could rapidly drop reproduction numbers cheaply and effectively. Other interventions are likely to take longer to implement or be too costly for widespread use.

Lockdowns with financial compensation.

We have strong demonstrated evidence that lockdowns work at stopping transmission across the globe. Assuredly this will be difficult to implement in the US due to sociocultural and economic factors but if we are looking to stop transmission lockdowns will do it.

Increase the rate of vaccination by opening new locations and/or expanding hours for vaccine administration.

A small percentage of distributed vaccines have been used. Increasing the actual administration of these vaccines is critical for slowing the spread of the epidemic.

Honestly all other interventions seem in my opinion to be much less effective/feasible. Increasing vaccination is of course useful but we are constrained by supply. Stay at home/lockdown orders would be useful but likely just economically too costly. Rapid systematic testing could help but we don't have the supplies/tools and infrastructure. So I consider a lot of the other approaches that were proposed worth doing but they are so far lower in anticipated effectiveness and feasibility compared to masks and depend so much on the details that I can't really rank them further.

See comment above.

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Ramping up testing accessibility and turn-around times in conjunction with a larger cadre of contact tracers/community health workers. Part 1 is feasible in the short time intervals under consideration whereas Part 2 would be medium-term.

Testing is readily available in many/most urban centers but lacking elsewhere; and turn-around time is often too slow for health response. This is the bedrock of mitigation and we're not utilizing resources well.

First-dose vaccination using a majority of available doses (with health care workers and the elderly put first followed by employees who cannot work from home) employing creative solutions for further production (i.e. engaging the Defense Production Act of 1950) and reach (i.e. overnight vaccination in open-air stadiums mobile vaccine vehicles etc.)

A recent study by Tuite et al. in the Annals of Internal Medicine suggests that first-dose vaccination for as many people as possible (with a <50% reserve for Dose 2) \*while simultaneously\* investing in logistics and supply chain for second dose distribution may avert significantly more cases than reserving 50% of available doses for Dose 2.

We need to shut down as much as reasonably possible (but more so than in the past) for 3-4 weeks and make it as easy as possible for people during this time. Many stores already allow options for curbside pick-up; people could be given a discount if they use types of services.

We need to reduce the transmission of disease. We can dramatically lower the curve by shutting down severely. Shutting down also sends the message that we are all taking this seriously and When we open up again a greater percentage of the population will have been vaccinated.

### The third most effective interventions and a rationale

A national stay-at-home order \*with financial compensation for wages lost

With B117 now in multiple states it is likely that we will see a considerable surge in cases during a period of growth that is \*already\* exponential in many locations. Though stay-at-home orders are not sustainable in the long-term financial compensation for wages lost may make its use more feasible as a short-term stop-gap measure during unprecedented periods of transmission. With appropriate planning and foresight I believe that the Biden Administration is capable of putting into place such a measure.

Federally-organized massive scaleup of all vaccination efforts to get to a level commensurate with reality.

This IS the way out of the pandemic (predicated on durable immunity). Current efforts are a patchwork of (generally) poorly-organized and poorly implemented programs at nowhere near the throughput necessary. FEMA- and military logistics-scale operations need to be implemented nationwide immediately (albeit titrated on vaccine supply).

Mask mandate in public places and increased availability of surgical masks

Masks are known to be very effective in reducing infection events and disrupting transmission chains.

Increased testing.

Universal testing will be key for situational awareness.

Begin pooled testing with rapid testing for any school college or business which is open. Testing is provided and reported on a daily basis and paid for by the government.

It is the most effective method because it allows Infectious people to be identified early and removed from infecting other people. It would also allow Public Health officials to more accurately gauge the number of people who are infected.

Increased testing especially for the new variant

Test positivity rates across the US are consistently high and ramping up test capacity would enable us to detect more asymptomatic cases. Especially detecting where the new variant is circulating will allow us to get ahead of the rapid surges like those seen in Western Europe.

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Masks are known to be very effective in reducing infection events and disrupting transmission chains.

Target contact tracing at identified B117 cases.

B117 is more transmissible. Targeting contact tracing resources at it could slow its spread.

#### **The fourth most effective interventions and a rationale**

Rapid dissemination of hospital-grade PPE to essential workers including teachers public transport employees and others with public-facing jobs.

Essential workers bear an unconscionably high burden of COVID-19. Despite being at equal or higher risk of COVID-19 infection relative to healthcare workers they have not been provided the appropriate PPE. Doing so could reduce the risk of super-spreading events and protect vital elements of our national infrastructure

Better enforcement of social distancing and mask wearing.

Again there is ample evidence that social distancing and mask wearing are effective at reducing SARS-CoV-2 transmission but enforcement of mask wearing is virtually nonexistent in most places. A coordinated effort at ensuring individuals do actually wear their masks is needed.

Universal regular (weekly or more frequent) testing.

I don't know how feasible this is within the next 8 weeks but with some new at-home tests coming available and general testing capacity continuing to improve a regular (at least weekly ideally several times a week) testing (with rapid results) for everyone could help reduce spread. Though as with for mask wearing I'm not too hopeful people would do the regular testing or would sufficiently isolate if positive.

Expand access to free rapid testing.

Currently the cost and/or turnaround time of testing is preventing it from being a useful intervention.

Begin a nationwide seroprevalence study using random sampling conducted on a daily basis.

A seroprevalence study would allow Public Health Professionals to convey the risk to the general public and more accurately nowcast and forecast.

Short stay at home orders in hotspots

Restricting cross-household interactions except for essential activities in certain hotspots will allow the testing capacity to catch up with the rapid spread in such regions.

Rapid dissemination of hospital-grade PPE to essential workers including teachers public transport employees and others with public-facing jobs.

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#### **The fifth most effective interventions and a rationale**

close all indoor non-essential dining and retail

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Occupancy limits and social distancing in indoor retail/restaurants/religious-venues

Reducing across household interactions will prevent superspreader events.

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## **PHASE I REPONSES**

### **The most effective interventions and a rationale**

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Telework recommendations / support for all jobs where constant in-person presence is not critical to the job function and where the work itself is not essential.

So much workplace transmission right now and many managers reluctant to lose their "edge" over competitors by allowing permissive telework options.



Universal mask mandate with hefty fines for not following the rules.

If effective (N95 or similar) masks were worn (properly e.g. nose must be covered) during all non-household contacts I believe it would reduce transmission massively. It seems the least intrusive option possible. Lockdowns as they currently happen in Europe would work too but don't seem feasible in the US. Honestly at this point I don't think anything is going to work in the US other than waiting for herd immunity to build up through a combination of infections and vaccinations. People just seem to not care.

"Lockdowns" with fully supported paid time off for all residents.

All current testing/contact tracing quarantine and isolation schemes assume persons have the resources needed to self-isolate or self-quarantine; true "stay at home" is essential to get the national epidemic to a state where distancing/contact tracing can be effective.

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Increase the rate of vaccination by opening new locations and/or expanding hours for vaccine administration.

A small percentage of distributed vaccines have been used. Increasing the actual administration of these vaccines is critical for slowing the spread of the epidemic.

Improve the efficiency of creating a vaccinated population including prioritizing all essential personnel and one person per household who can run errands. This may involve a combination of making it easier to register for vaccines and calling people on the waitlist when there are no-shows to ensure no vaccines are wasted; employing additional people to administer vaccines; or adopting practices from vaccine campaigns in other country for other diseases.

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## The second most effective interventions and a rationale

Proactively administer vaccines to those at highest risk of infection especially the elderly.

Much of the vaccination that's happening in the US requires potential recipients to seek the vaccine themselves; there is little direct messaging and little assistance given especially to elderly individuals who have no outside help to navigate web pages. If this reactive approach continues we will continue to lag far behind our vaccination goals and miss many people who need the vaccine most.

Universal regular (weekly or more frequent) testing.

I don't know how feasible this is within the next 8 weeks but with some new at-home tests coming available and general testing capacity continuing to improve a regular (at least weekly ideally several times a week) testing (with rapid results) for everyone could help reduce spread. Though as with for mask wearing I'm not too hopeful people would do the regular testing or would sufficiently isolate if positive.

Scaling up of testing in all states.

Testing availability and turn-around remains an issue in most states.

close all indoor non-essential dining and retail

In addition to curtailing spread at these locations this sends a strong clear message to people about the seriousness of the situation. I hear so much "if the govt hasn't closed it it must be safe"

First-dose vaccination using a majority of available doses (with health care workers and the elderly put first followed by employees who cannot work from home) employing creative solutions for further production (i.e. engaging the Defense Production Act of 1950) and reach (i.e. overnight vaccination in open-air stadiums mobile vaccine vehicles etc.)

A recent study by Tuite et al. in the Annals of Internal Medicine suggests that first-dose vaccination for as many people as possible (with a <50% reserve for Dose 2) \*while simultaneously\* investing in logistics and supply chain for second dose distribution may avert significantly more cases than reserving 50% of available doses for Dose 2.

Increased vaccination rates in forecasted hotspots

Increasing vaccine rollouts (especially the first dose) in forecasted hotspots will ensure we reduce the case burden and prevent overwhelming hospital resources.

We need to shut down as much as reasonably possible (but more so than in the past) for 3-4 weeks and make it as easy as possible for people during this time. Many stores already allow options for curbside pick-up; people could be given a discount if they use types of services.

We need to reduce the transmission of disease. We can dramatically lower the curve by shutting down severely. Shutting down also sends the message that we are all taking this seriously and When we open up again a greater percentage of the population will have been vaccinated.

Expand access to free rapid testing.

Currently the cost and/or turnaround time of testing is preventing it from being a useful intervention.

## Lockdowns.

We have strong demonstrated evidence that lockdowns work at stopping transmission across the globe. Assuredly this will be difficult to implement in the US due to sociocultural and economic factors but if we are looking to stop transmission lockdowns will do it.

## The third most effective interventions and a rationale

### Occupancy limits and social distancing in indoor retail/restaurants/religious-venues

Reducing across household interactions will prevent superspreader events.

### Target contact tracing at identified B117 cases.

B117 is more transmissible. Targeting contact tracing resources at it could slow its spread.

Begin pooled testing with rapid testing for any school college or business which is open. Testing is provided and reported on a daily basis and paid for by the government.

It is the most effective method because it allows Infectious people to be identified early and removed from infecting other people. It would also allow Public Health officials to more accurately gauge the number of people who are infected.

### Limit daycare cohort sizes. Limit in-person class sizes. Less than 10 in cohort.

Although children may not spread as efficiently as adults in congregate care and education settings with high community transmission they can still propagate transmission.

### Rapid dissemination of hospital-grade PPE to essential workers including teachers public transport employees and others with public-facing jobs.

Essential workers bear an unconscionably high burden of COVID-19. Despite being at equal or higher risk of COVID-19 infection relative to healthcare workers they have not been provided the appropriate PPE. Doing so could reduce the risk of super-spreading events and protect vital elements of our national infrastructure.

### Better enforcement of social distancing and mask wearing.

Again there is ample evidence that social distancing and mask wearing are effective at reducing SARS-CoV-2 transmission but enforcement of mask wearing is virtually nonexistent in most places. A coordinated effort at ensuring individuals do actually wear their masks is needed.

## The fourth most effective interventions and a rationale

### Begin a nationwide seroprevalence study using random sampling conducted on a daily basis.

A seroprevalence study would allow Public Health Professionals to convey the risk to the general public and more accurately nowcast and forecast.

Increase testing availability.

% positivity is high nationally. Testing is how you effectively find and isolate cases. I think by "effective" in this survey you were maybe hoping for "efficient" or "low-cost"? I can't tell so I'm including this anyway. Yes it costs money but it's money well spent.

Increased testing especially for the new variant

Test positivity rates across the US are consistently high and ramping up test capacity would enable us to detect more asymptomatic cases. Especially detecting where the new variant is circulating will allow us to get ahead of the rapid surges like those seen in Western Europe.

Close indoor dining and bars.

Indoor dining and bars are high risk for spread.

### **The fifth most effective interventions and a rationale**

Shelter-in-place if the aforementioned interventions are not sufficient.

This does not cost much to implement but bears enormous societal and economic costs. It would be helpful if the survey specified whether it was looking for low upfront costs or low total economic burden.

Create a national mask mandate.

Masks are a low cost effective intervention.

Short stay at home orders in hotspots

Restricting cross-household interactions except for essential activities in certain hotspots will allow the testing capacity to catch up with the rapid spread in such regions.

Better educate the public on all aspects of COVID-19: uncertainty in what we think we know full transparency on vaccines (antibodies don't really become helpful until after 10 days or so resulting in many people getting COVID shortly after getting the vaccine data hasn't been collected on what happens if the 2nd shot is delayed it will be somewhat painful etc.) prevention (how to wear masks properly what masks to wear proper guidelines for ventilation indoor transmission vs outdoor transmission etc.) testing (advantages of Rapid Testing vs PCR explanation of apparent false positives and false negatives) long COVID effects vulnerabilities for various age groups and demographics.

People don't have a good understanding of the information that is available and do not completely trust the information from the government. The public trust needs to get vaccinated if herd immunity is to be achieved. Some people would do better if they knew better as far as lowering their risk of infection and transmission.