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# Achieving Warranted Public Acceptance of Biopharma

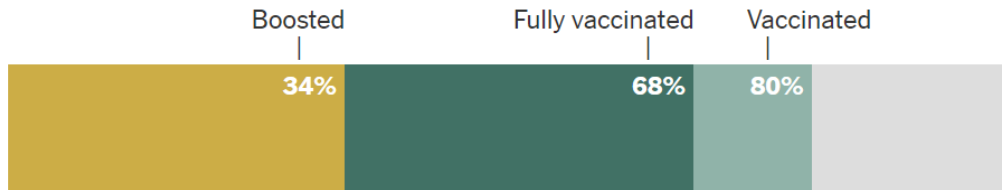
Emily Grayek and Baruch Fischhoff

# National Network for Critical Technology Assessment

- ▶ One year pilot funded by National Science Foundation to make a case for research and analytics for national technology strategy
- ▶ 20+ academic experts across science and technology policy, data science, social and economic sciences
- ▶ 4 technology deep dives
- ▶ 2 cross-cutting thrusts

# The need for public engagement

## Share of U.S. population that is...



Sources: Centers for Disease Control and Prevention, U.S. Census Bureau | Note: Figures include the U.S. territories and three countries with [special agreements](#). The C.D.C. reported on Nov. 30, 2021 that booster doses are sometimes misclassified as first doses, which may overestimate first dose coverage.



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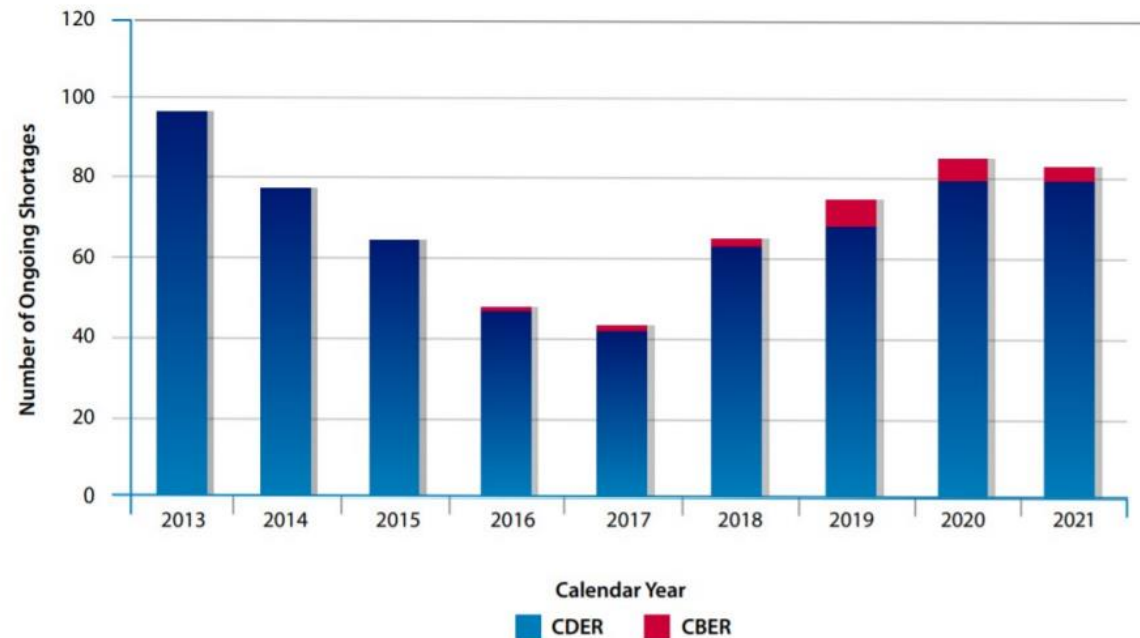
- ▶ Consumer demand
- ▶ Workforce
- ▶ Advocacy
- ▶ Democracy

[https://www.nytimes.com/interactive/2020/us/covid-19-vaccine-doses.html?pageType=LegacyCollection&collectionName=Maps+and+Trackers&label=Maps+and+Trackers&module=hub\\_Band&region=inline&template=storyline\\_band\\_recirc](https://www.nytimes.com/interactive/2020/us/covid-19-vaccine-doses.html?pageType=LegacyCollection&collectionName=Maps+and+Trackers&label=Maps+and+Trackers&module=hub_Band&region=inline&template=storyline_band_recirc)

# First Application: Technology Solutions for Generic Drug Shortages

- ▶ 295 Current Shortages
- ▶ Many potential solutions to address the problem
  - ▶ Emerging technologies
  - ▶ Reporting
  - ▶ Inventory Management
- ▶ Ongoing work will determine what drugs should be prioritized for policy initiatives

Figure 3. Number of Ongoing Drug Shortages Per Calendar Year, 2013 to 2021.



# What can we do?



Understand what the public cares about in terms of technologies and policies



Communicate to the public about the issues and policies

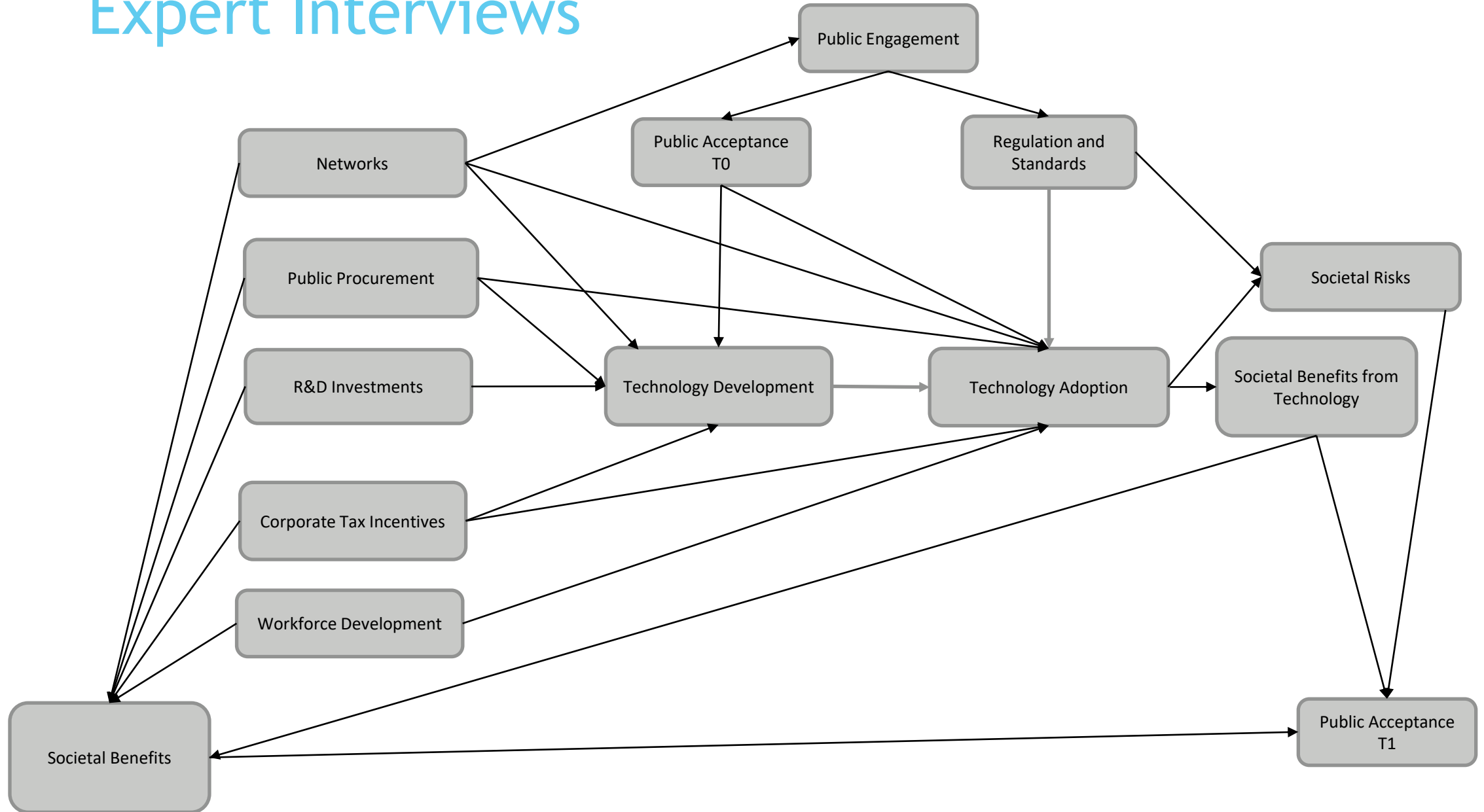


Incorporate considerations into decision making

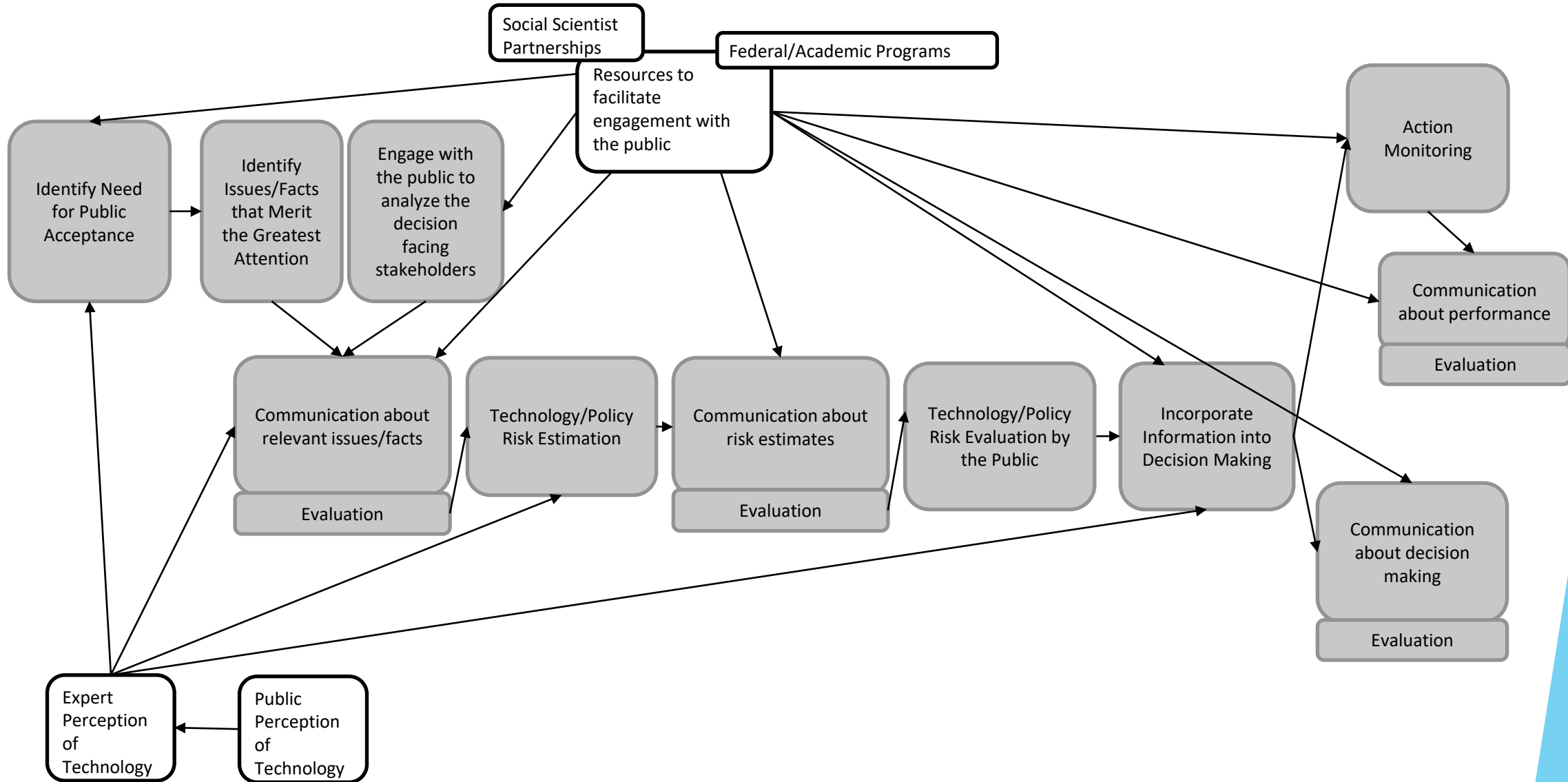
# Mental Models Approach

1. Identify the most relevant facts for the choice at hand
2. Find out what the public already knows
3. Design communications to fill the gaps
4. Evaluate
5. Elicit information
6. Repeat as necessary

# Expert Interviews



# Expert Interviews





# Expert Interviews

- ▶ Experts mentioned a variety of technologies both traditional and advanced technologies
- ▶ All experts felt that the public would not have issues with acceptance of the manufacturing technologies
- ▶ All technologies that were discussed could offer national security benefits through reducing drug shortages. Advanced technologies offered additional benefits such as improving productivity and environmental sustainability.
- ▶ Potential risks were related to opportunity costs of investing in technologies or taking a piecemeal policy approach

# Formative Survey with General Public

- ▶ What experiences have they had with shortages? What shortages would they want to prevent in the future?
- ▶ What could have been done to prevent a previous shortage? Who should have prevented the shortage?
- ▶ What were their opinions on potential policy solutions?
- ▶ Who should be making policy decisions?
- ▶ What information could the public give?
- ▶ What information should be communicated to the public?

# What experiences have they had with shortages?

- ▶ 52% of participants reported that they knew of someone who dealt with a shortage in the past
- ▶ 41% of participants reported a drug shortage that could be confirmed with ASHP or FDA shortage databases

<i>How did the shortage affect you or the person you know?</i>	<i>n (N=43)</i>	<i>Examples</i>
Disease symptoms	14	“Adderall. For me, one of my most prominent issues is lack of emotional stability. I am also Bipolar II and I was going through a manic episode at that time. Without my Adderall, I was even more unstable than usual. It also mildly affected my work performance (prior to my manic episode).”
Difficulty obtaining drug	11	“My friend's albuterol [...] ran short in supply during the pandemic. He was absolutely terrified. Luckily his work has him traveling the world, so he was able to find medicine while in business in Europe, but I'm scared to think what may have happened if he was stuck in the US.”
Stress/unease	10	“Insulin, It was extremely stressful since they had to almost ration what they did have.”
Substitution	5	“My friend was unable to get her normally prescribed Adderall. She had to try another drug, which did not work as well and caused side effects.”
Withdrawal symptoms	3	“Adderall. It not only made my mom not able to focus at her work, but the withdrawal symptoms made her so sick she had to call in and I had to care for her.”

# What shortages would they want to prevent in the future?

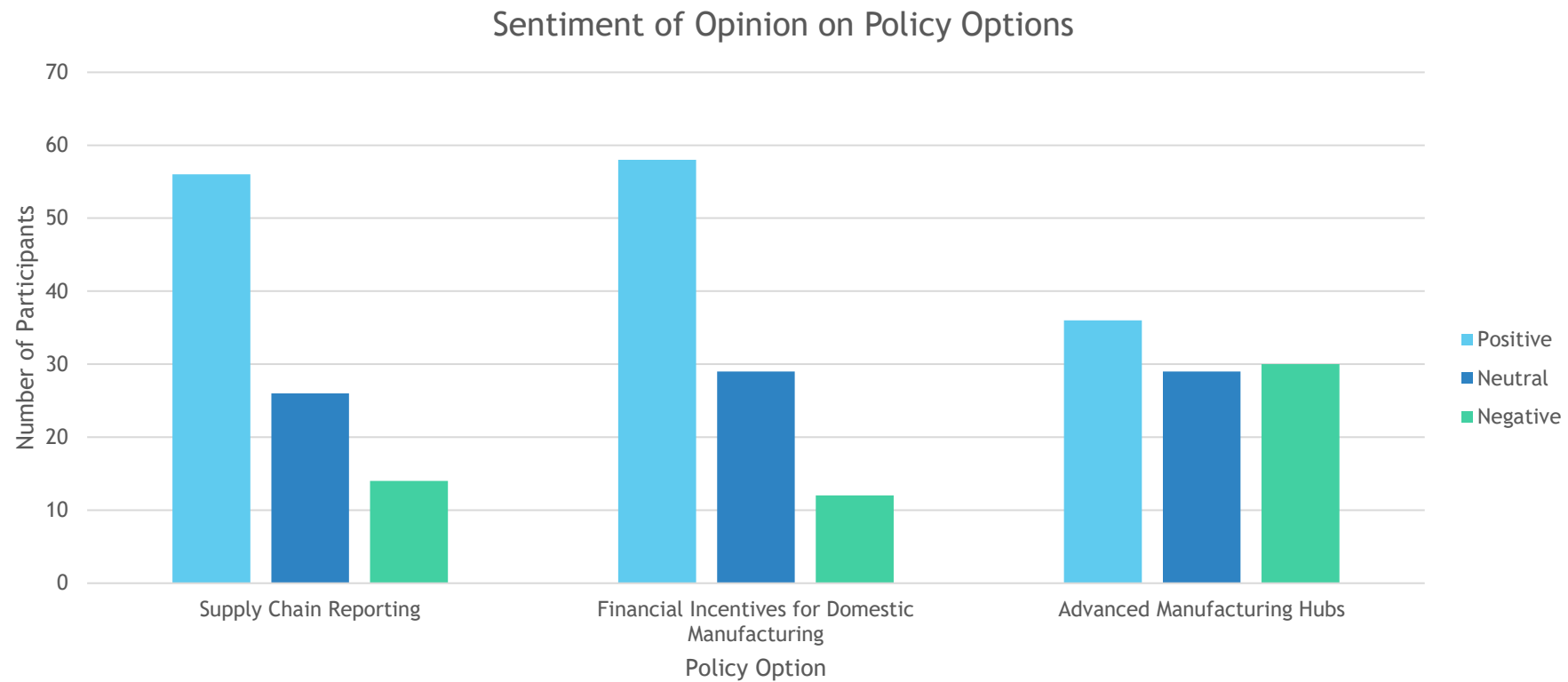
- ▶ Most responses were related to preserving life (63/118)
- ▶ Preserving quality of life and mental health were also important
- ▶ Respondents also considered drug demand, availability of substitutes, and withdrawal symptoms

# What could have been done to prevent a previous shortage? Who should have prevented the shortage?

<i>Process or Outcome</i>	<i>Idea for prevention</i>	<i>n</i> (N = 124)
Process (n = 59)	Incentivize manufacturing the drug	26
	Increased government control over manufacturing	13
	Stockpile of drug or key materials	11
	Increased manufacturing oversight	9
Outcome (n = 47)	Have more manufacturers	21
	Improved manufacturer quality control	13
	Manufacture more of the drug	8
	Manufacturer should not care about profits	5

<i>Who should have prevented the shortage?</i>	<i>n</i> (N=112)	<i>Examples</i>
Manufacturer	59	"The manufacturers could have prevented the shortage by taking action years before the shortage."
Government	47	"Ultimately our government should be able to step up and find better solutions for life saving drugs to be produced and distributed"
FDA	6	"The FDA, of course. [...] No doubt they could've identified a potential shortage before it happened, or at least been able to lessen the impact."

# What were their opinions on potential policy solutions?



# Communication Strategy: Who should be making policy decisions?

<i>Who should be making policy decisions?</i>	<i>n</i> (N=162)	<i>Examples</i>
Federal Government	67	"I think this should be a federal level policy decision, as there should be universal policy change regarding pharmaceutical supply chains."
Drug Companies	21	"a combination of pharmaceutical personnel, physicians, pharmacists and an oversight committee who is free from pharmaceutical handouts and donations."
Medical Professionals	17	"There should be a special committee consisting of those from the pharmaceutical industry, doctors, and patient advocates. After their decisions are made, this should be presented on the floor to lawmakers and they will decide to enact such policies."
General Public	13	"Everyone - everyone in the world is and could be a patient!"

# Communication Strategy: What information could the public give?

<i>What information could the public give?</i>	<i>n</i> (N=114)	<i>Examples</i>
Personal experiences with drug shortages	29	"I think that the public could share their experiences with drug shortages, pricing, and things like that, but ultimately I don't think it changes the minds of policymakers as they are often in a more advantaged place, and can be out of touch."
Medical history and data	17	"I think that the public can share statistics based around medical usage and also enlist them in taking clinical studies that help with the information to back their reports [...]"
Drug pricing experiences and opinions	16	"We could share the burden of cost, the effects of the shortage, and the need for more domestic production."
Opinions on policies	15	"I think the public should share their opinions with policymakers and make known their stance and any issues that may arise if the policies are adopted."



# Communication Strategy: What information should be communicated to the public?

<i>What should be communicated to the public?</i>	<i>n</i> (N=121)	<i>Examples</i>
Everything	26	“Everything, there should be full transparency.”
Decision making process	24	“Transparency regarding who is making them, the processes they are considering, who is lobbying those policy makers and how much money they're giving. I would want to see clear justification for the policy decisions they're making.”
Policy costs and benefits	21	“The public should receive information regarding the advantages and disadvantages of the policy options being evaluated. They should also be informed how these policies could affect their access to medications and healthcare expenses.”
Policy outcomes	20	“I suppose the most pressing things for the public to know are any changes in price or time it takes to get a medication -- and if it is a potential increase in either of those things, there is a responsibility to explain why that is happening.”

# Formative Survey with General Public

## ▶ Public outcomes

- ▶ Number of shortages
- ▶ Impact on taxes
- ▶ Drug costs
- ▶ Job opportunities
- ▶ Company decision making
- ▶ Total funding

## ▶ Expert outcomes

- ▶ Number of shortages
- ▶ Drug costs
- ▶ Infrastructure investments
- ▶ Investments from companies
- ▶ Employment in sector
- ▶ Onshore facilities
- ▶ Supply Map Vulnerability Scores
- ▶ Technology utilization
- ▶ Health outcomes

# Formative Survey with Physicians and Pharmacists

- ▶ Sent a similar survey to a convenience sample of physicians and pharmacists
- ▶ Will get different definitions of what an essential medicine is
- ▶ Will find out if a different communication strategy is needed with this subset of the public

# Policy Implications

- ▶ Both experts and the public feel that this issue is important to address
  - ▶ “I think the public needs to come out and scream for blood about [the drug shortage problem].”
- ▶ Communication strategy will have to account for
  - ▶ Public’s lack of knowledge about potential solutions
  - ▶ Public’s concerns about drug pricing
  - ▶ Public’s lack of trust in the industry
- ▶ Public expects communication, but a strategy shouldn’t be assumed
  - ▶ “The public, if we've got really, really, really great investments and we've incentivized true transformation as we've been talking about in this conversation. I think the public acceptance will follow.”