

Innovation policy principles to beat COVID-19

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COVID-19 presents policy makers a brutal choice between economic and public health

- ***The pandemic is a clear an present danger to the economy***
 - Reduction of GDP by $\approx 30\%$ during lockdown (US estimate)
 - Governments around the world spend big \$\$ to compensate (in the US, $\approx \$2.8$ trln.)
- ***Consider additional R&D investment that could potentially bring forward an effective vaccine **by just one day*****
 - If this investment costs less than the daily loss in GDP (\$18 billion in the U.S. alone) it would pay for itself
- ***Innovation can help modern societies escape the untenable choice between public and economic health***
 - The world needs effective vaccines, therapies, or other solutions
 - How do we achieve these solutions, and achieve them quickly?



Organizing for COVID-19 innovation: Core principles

- ***Support many independent avenues of research***
- ***Draw widely on talent***
- ***Demand transparency and openness across the private and public-sector efforts***



The implication of ubiquitous failure

- ***Innovation projects are risky!***
 - *This is why a robust portfolio is needed*
- ***Suppose the government supported 10,000 research projects, and each one had just a 0.1 percent chance of being a major advance***
 - *Right tail of the binomial distribution → 97 percent chance that at least five of those projects would yield positive results*



Diversity and parallel exploration

- ***Diversity of exploration domains: infection control, diagnostic testing, antivirals, vaccines, epidemiological modeling, bedside treatments***
- ***Diversity of disciplines: immunology, clinical medicine, social sciences, epidemiology***
- ***Diversity of time horizons, including the long-term***
 - Answering “why” questions is often important
 - A vaccine in 2021 is far from guaranteed
 - Who says COVID will be the last pandemic?



Draw widely on talent

- ***In what world are biomedical workers considered “not essential”?***
 - Many labs are still shuttered (including at MIT!)
- ***Restrictions on international travel and immigration rules hamper the operation of scientific teams***
 - Every experiment cannot be conducted virtually!



Transparency

- ***No reason to believe market forces alone will deliver the optimal amount of research diversity***
- ***Policy makers need a dashboard to judge whether bets have been spread wide enough***
- ***Openness can also help private-sector firms avoid needless duplication of efforts, especially when many efforts are expected to fail***



A few concrete steps

- ***Emergency footing for public funding agencies***
 - *NIH's version of "fast grants" is still not very fast*
- ***Loosen visa policies for biomedical researchers at all career stages***
- ***Create a COVID Defense Research Committee***
 - *Modeled after NDRC during World War II*
 - *Track R&D efforts*
 - *Create a public clearinghouse documenting avenues pursued*
 - *Fund the scaling-up of successful advances*
 - *Streamline bureaucracy*
- ***Spain cannot do this on its own, but the EU can do this; the US also could...but we may have to wait until January 2021***

