ARPA-H, A New Model for Innovative Health Research

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Biomedical research has traditionally been slow and incremental, but the COVID-19 pandemic prompted a rapid break from this standard. The cornerstones of health research funding – gradual change and risk aversion – went out the window as the global medical community turned its attention to finding treatments and vaccines for COVID as fast as possible.

In April 2021, President Joe Biden proposed a $6.5 billion health research agency that would treat research for every disease with this same urgency (Hatmaker 2021). The Advanced Research Projects Agency for Health (ARPA-H) would sit within the National Institutes of Health and would take aim at developing groundbreaking treatments for diseases like Alzheimer's, cancer, diabetes and more. ARPA-H would have a funding mechanism focused on high-risk, high-reward projects, distinguishing it from the other, more conservative, health research pipelines within the federal government. The idea of ARPA-H was initially pitched to the Trump administration (Snyder 2017) without great success, but President Biden's history of spearheading large scale health research programs like the Cancer Moonshot Initiative makes him an ideal champion for the ARPA-H project.

THE ORIGINS OF ARPA

The ARPA model was first introduced with the 1958 creation of the Defense Advanced Research Projects Agency (DARPA) in response to the Soviet Union's Sputnik 1 launch. In the 60 years since, DARPA has focused on high-risk, high-reward research projects, sometimes in the absence of an immediate known need for the research in question. DARPA has had a major role in the development of world changing technologies including early iterations of the internet, GPS, and the mRNA vaccine technology that is the foundation for the Pfizer and Moderna COVID-19 vaccines (Sonne 2020).

ARPA-H would not be the first DARPA copycat agency. The Intelligence Advanced Research Projects Activity (IARPA) was founded in 2006 to support the intelligence community, and the Advanced Research Projects Agency–Energy (ARPA-E) was created in 2009 and focuses on energy solutions. ARPA-H is actually one of two ARPA projects proposed by the Biden administration. The other, ARPA-C, would fall under the Department of Energy and focus on climate issues (US Office of Press Secretary 2021). The strong track record of DARPA and

other ARPA agencies signal that under the right leadership, the model could be successfully implemented in the health field.

THE ARPA MODEL: HIG RISK, HIGH REWARD AND THE ABILITY TO FAIL

The rigidity of traditional health research funding mechanisms encourages risk-averse investments and incremental change. Researchers applying for NIH funding grants must complete a lengthy application process, and only about 20% of applications are selected for funding (NIH 2021). Projects must also undergo a rigorous peer review process which can be fraught with challenges and red tape (Bendiscioli 2019). These institutional barriers mean that many innovative research ideas never see the light of day because they are seen as too risky.

The ARPA model is different from existing and traditional federal research funding mechanisms (Azoulay et al. 2018), and could allow for rapid scientific advancement in the healthcare field. Rather than a hierarchical structure entrenched in politics and bureaucracy, DARPA is flat, with around 100 program managers who have a considerable amount of autonomy in making funding decisions. The program managers are also term-limited, which encourages them to pursue more high-risk, high-reward research and ensures that new ideas and projects are continually rotating into the agency. For an agency to truly dream big, it also has to be willing to fail big, and DARPA itself credits risk-taking and tolerance of failure as major sources of its success (DARPA 2016). Applying the ARPA model to health research would allow for exploration and development of truly innovative solutions to health challenges that would never be given a chance under the traditional funding mechanisms.

WHAT'S NEXT FOR ARPA-H

Executive will alone is not enough to bring an ARPA initiative into existence. In 2012, the Obama administration tried to establish an ARPA-ED for education (US Office of Press Secretary 2011), but the funding proposal was cut in the congressional budget negotiation process. Its now defunct website serves as a stark reminder that bipartisan support throughout many levels of the federal government will be needed to bring ARPA-H to life. Though ARPA-H has champions on both the left and the right side of the aisle, the initiative has failed to gain full support in Congress. Over the summer, the House designated less than half of the funding that the Biden administration had requested, and in October 2021, ARPA-H was cut out entirely from the Senate's social infrastructure reconciliation bill.

ARPA-H's exclusion from the social infrastructure bill is not a terminal diagnosis for the program, as it could still gain support in a standalone bill. The Bipartisan 21st Century Cures 2.0 Bill spearheaded by Reps. Diana DeGette and Fred Upton (US House 2021) would include funding for ARPA-H, and Rep. Anna Eshoo, chair of the House Energy and Commerce Health Subcommittee, has released a standalone bill that would establish ARPA-H under the Department of Health and Human Services as opposed to the National Institute of Health (US House 2021).

The COVID-19 pandemic showed how quickly our health science researchers can tackle crises when funders are willing to invest in high-risk, high-reward projects. ARPA-H would

apply this same mentality to all diseases and could fundamentally change the face of medical research and healthcare as we know it. The United States has long been a leader in groundbreaking healthcare developments, and the establishment of ARPA-H would enable the top minds in the health sciences field to be bolder and more innovative than ever before.

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