

Comments for ARPA-H Listening Session August 16, 2021

- **Thank you** for the invitation to participate today on behalf of the **Friends of NIMH** to provide ideas for the exciting and ambitious ARPA-H proposal. It is an honor to have this opportunity.
- As plans for ARPA-H evolve, I urge leadership to think about mental health as being both **vertical and horizontal**, to borrow framing from Dr. Panchanathan, the director of the NSF.
- In terms of vertical, ARPA-H should prioritize pressing stand-alone mental health issues such as suicide. Despite significant advances, suicide remains the second leading cause of death for people ages 10-34 and the fourth for ages 35-54.
- Horizontally, mental health research must be woven throughout **every aspect** of physical health. The two are intertwined and bi-directional. NIMH research has established that a lifetime of mental health difficulties is predictive of poor physical health, poor work, and difficulties in family life, making clear how mental health problems impair health in mid- and later-life.
- **Implementation science, early intervention**, and collection of new data through **wearable devices** offer opportunities for how additional funding and the flexibility of ARPA-H might improve mental and physical health in ways above and beyond the already tremendous work of NIH and NIMH specifically.
- ARPA-H should support **Implementation Science** or an implementation incubator to develop systems and processes for translating established science and evidence for any given disease out to the public and to practitioners working directly with patients. Developing frameworks, methods, and outcomes would accelerate the impact of NIH research and increase the return on investment. While this is already happening to some degree in some institutes, there is tremendous opportunity for growth.

By way of example, NIMH-funded work identified a gap between the established evidence base for effective psychosocial treatment and the interventions being delivered to adolescents suffering from high levels of anxiety. This gap between services delivered and the best evidence may be particularly pronounced in underserved communities.

- Next, ARPA-H should consider the importance and promise of **Early Intervention** – Altering trajectories earlier is widely agreed to be more advantageous than intervening later in disease development.

Having listened to several of these sessions, I have heard many of my colleagues underscore the importance of prevention, which supports it being a central goal for ARPA-H.

However, scientists from our community have reported finding it difficult to compete for funding for areas of inquiry that would advance early interventions.

Part of the challenge might be that early intervention necessitates a unified approach and a life course perspective, requiring comprehensive longitudinal studies that may or may not be focused on a mechanism or outcome. Thus, this research might fall into the high-risk and potentially high reward objectives of ARPA-H, but not necessarily the portfolio of individual institutes.

Let me offer an example from research on **schizophrenia**. Numerous researchers, and potentially institutes, hold various pieces of the complicated puzzle. Research has linked maternal infectious diseases during pregnancy to risk factors for schizophrenia, noting cognitive changes in childhood well before the onset of symptoms. Scientists have also examined the use of marijuana as precipitating onset of symptoms. How do all of these studies get woven together to lead to early detection and intervention? For example, can we identify high-risk adolescents and recommend that they, in particular, avoid

marijuana use? This example points back to the importance of **implementation science** and also connects to my next point.

- Revolutionary tools in **remote monitoring** have the potential to generate comprehensive data to augment our understanding of health and disease and to enable time-sensitive intervention.

Wearable health monitoring devices have created new opportunities (and threats) for understanding and treating a wide range of diseases. Commercial products already support people in achieving diet and exercise goals, manage their diabetes, or evaluate their cardiac function. Linked to GPS data and other governmental records, wearables and self-reports via smartphone probes could create a database that would enable computational analysis to identify patterns of disease and even warning signals for crises. Consider, with these additional measures, the increased the power of Telehealth.

However, there are enormous challenges to such an effort, both technical and in terms of threats to privacy and ethical concerns. Addressing these issues would require a technical and coordinated effort.

Furthermore, in the midst of this opportunity is a pressing need to develop additional measures of behaviors, emotions, and cognition that are commensurate with existing biological measures.

To conclude, many, including the World Health Organization, have predicted that mental illness will be the next pandemic. ARPA-H has the potential to revolutionize the collection of health data through wearable devices and advance implementation science to support early detection and interventions to prevent and reduce the impacts of mental illness. Like COVID, underrepresented communities are likely to suffer disproportionately, making these efforts all the more urgent.

