January 2023 ELSI Friday Forum: Wrestling with Social and Behavioral Genomics

Introduction

The Center for ELSI Resources and Analysis (CERA) hosted its January 2023 ELSI Friday Forum titled "Wrestling with Social and Behavioral Genomics" on January 13, 2023. This virtual forum brought together experts from various disciplines to discuss the complex ethical, legal, and social implications (ELSI) of social and behavioral genomics research. The event featured presentations from Dr. Benjamin Neale, Co-director of the Program at Medical and Population Genetics at the Broad Institute and Director of Genetics at the Stanley Center for Psychiatric Research, and Dr. Evelynn Hammonds, Barbara Gutmann Rosenkrantz Professor of the History of Science, Professor of African and African American Studies, and Professor of Social and Behavioral Sciences at Harvard University. The session was moderated by Dr. Erik Parens, Senior Research Scholar at the Hastings Center, and Dr. Michelle Meyer, Associate Professor and Chair of the Department of Bioethics and Decision Sciences at Geisinger. Dr. Sandra Soo-Jin Lee facilitated the event.

The forum aimed to explore the nuanced perspectives on social and behavioral genomics (SBG) research, which investigates how genetic differences are associated with social and behavioral phenotypes. Dr. Parens described the purpose of the event as an opportunity to "wrestle with" rather than dismiss or uncritically accept this field of research. The discussion stemmed from a three-year project culminating in a report to be published in the Hastings Center Report.

Key Insights from Dr. Benjamin Neale

Dr. Neale provided an overview of the current state of genomic science and its application to complex traits. He began by emphasizing that even medical traits like blood pressure show significant population differences that cannot be simply attributed to genetics or environment alone. This complexity, he argued, highlights the challenge of making causal claims about observed population differences.

Dr. Neale explained how genomic research has evolved over the past 20 years, from mapping the human genome to developing technologies that can identify common genetic variations and, ultimately, sequence entire genomes at increasingly affordable costs. He emphasized that genetic variation reflects ancestral history and migration patterns of humans across the globe.

In discussing genome-wide association studies (GWAS), Dr. Neale demonstrated how researchers identify genetic variants associated with complex traits like schizophrenia. He stressed that these studies reveal complex genetic architectures with many small genetic effects, reinforcing the biological complexity of the traits being studied.

Dr. Neale addressed the application of genomics to social traits such as educational attainment, income, and same-sex sexual behavior. He highlighted two main purposes of genetics research: understanding biology and developing personalized interventions. However, he cautioned that genetic associations don't specify mechanisms and used the example of lung cancer and smoking to illustrate how genetic effects may be mediated through behaviors.

On polygenic risk scores (PRS), Dr. Neale emphasized their probabilistic nature, stating that "genes are not fate." While he acknowledged potential applications in research and clinical settings, he expressed personal objections to using such scores for embryo selection, noting that "there are a lot more risks than benefits in that space."

Key Insights from Dr. Evelynn Hammonds

Dr. Hammonds focused on the risks associated with social and behavioral genomics research, particularly from historical and social science perspectives. She emphasized that the interdisciplinary working group had to learn to communicate across significant disciplinary differences, with no simple breakdown between risks and benefits.

Dr. Hammonds identified several key risks, including how research results are presented by researchers and journalists, public understanding of genetics, and how results might be used to address social problems. She raised critical questions about what genomic research can actually tell us about individual phenotypes versus group differences, and what such results might mean for social policy.

Dr. Hammonds highlighted the conflation of scientific concepts with social constructs: "The concept of genetic populations, which is a scientific term, is easily conflated with social, scientific, and lay concepts of a population." This conflation, she argued, creates significant risks in SBG research.

Among the specific risks discussed by the working group, Dr. Hammonds emphasized: potential stigmatization of individuals and groups; reification of race and ethnicity as biological concepts; unethical applications of research results; inaccurate assertions that genetic results make social policy irrelevant; and arguments for diverting resources away from environmental and social factors.

Dr. Hammonds particularly stressed the risk of racializing genomic risk, noting an "appalling lack of knowledge" among scientists, social scientists, and the public regarding the definition of race and its history. She advocated for a deeper understanding of eugenics in the post-World War II period, including ongoing debates about genetic components of intelligence and racial differences.

Highlights from the Q&A Session

During the Q&A session, Dr. Meyer asked both speakers to reflect on how their views had changed during the three-year project. Dr. Neale emphasized his enhanced awareness of how easily researchers can "fall back into the racialized world that you are acculturated into." He noted that geneticists tend to focus on differences rather than emphasizing human similarities, and described how the project helped him recognize his professional responsibility to understand and address the impact of racialization on scientific work.

Dr. Hammonds reflected on the challenges of cross-disciplinary communication, noting that terms like "population" and "ancestry" often carried different meanings across disciplines: "We are fundamentally not talking about the same thing!" She described how the three-year engagement helped her better understand the role genetics plays in complex phenotypes and human behaviors.

One question addressed the statistical use of genetic information as control variables when the mechanisms aren't understood. Dr. Neale acknowledged this legitimate concern, noting that polygenic risk scores might simply reflect "what our education system currently values" rather than providing mechanistic insights. He cautioned that using such scores uncritically could reinforce existing structures and priorities.

When asked how health educators could apply the working group's analysis to address diversity issues and reduce educational and healthcare disparities, Dr. Hammonds emphasized the need for curriculum reform and reeducation. She critiqued simplistic historical narratives about African Americans and medicine, noting that persistent medical theories about fundamental biological differences between races continue to affect healthcare today.

Overall Themes and Takeaways

Several key themes emerged throughout the forum:

1. **Interdisciplinary Dialogue**: Both speakers emphasized the value of sustained, challenging conversations across disciplinary boundaries. The three-year project allowed participants to move beyond talking past each other to genuine engagement with different perspectives.
2. **Complexity of Genetic Influence**: There was general agreement that genetics plays a role in human behavior, but that this role is complex, probabilistic, and deeply intertwined with environmental factors. Dr. Neale repeatedly emphasized that "genes are not fate."
3. **Historical Context Matters**: Dr. Hammonds stressed the importance of understanding the history of genetic research, especially regarding race, to avoid repeating past mistakes. Both speakers acknowledged the need to reckon with the field's eugenic past.
4. **Balancing Risks and Benefits**: The speakers agreed that SBG research warrants "wrestling with" rather than outright dismissal or uncritical acceptance. They

acknowledged both potential benefits for understanding biology and serious risks of reinforcing stigmatization and inequality.

5. **Translation Challenges**: A significant insight was the recognition that different disciplines often use the same terms (like "population" or "ancestry") with very different meanings, creating barriers to effective communication.

The forum concluded with a call for continued engagement across disciplines to develop a nuanced understanding of the ethical implications of social and behavioral genomics research. As Dr. Hammonds noted, "This whole edifice of how we think about genetic variation, human variation, has been built over hundreds and hundreds of years. We're not going to fix it even in three! But at least, we jumped into the deep end and began to struggle through."