

Social and Regulatory Measures in Bionanomedicine in Asia: A Case for Responsible Innovation.

Abstract

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Ever since the Human Genome Project called for systematic knowledge on ethical, legal and social issues (ELSI) three decades back, rapid scientific and technological advances in regenerative, precision and Nano medicine have reinforced the case for ELSI. In the last decade, leading Asian countries (such as Japan, China, Singapore, India and Korea, among others) have not only launched national initiatives and strategies on genomic projects targeting national health and wellbeing concerns, but have advanced various research and innovation projects under the broad rubric of biomedicine (precision and personalized medicine, nano medicine, gene therapies, cell based therapies etc). Technological advances and innovation breakthroughs in genomic sequencing, gene editing and therapies, machine learning and data analytics, among other pathways to diagnose diseases have opened mega global health market potential. Creativity and innovation is taking place at the intersection of life sciences and engineering fields. For instance, molecular robotics is an emerging field for design and creation of biological structures to serve gene based therapies in health.

With the transformation of biomedicine as a complex health innovation system (involving governments, regulatory systems, biosafety protocols, citizens and their privacy, clinics, scientists, doctors and patients etc), ELSI has come into sharp focus. The concepts and norms of informed consent, privacy protection involving genomic data and biological samples and the whole relationships between patients and clinicians have now become integral part of the research agenda in biomedicine. The way in which diseases are diagnosed, preventive measures adopted and treated has challenged traditional ways of dealing with medical insurance on the one hand and raised related social and regulatory issues in genetic discrimination, on the other.

In this presentation we will portray the landscape of biomedicine in select Asian countries (Japan, China, India and Singapore) to explore various national initiatives, research and innovation policies including governance structures. Having done this, we will take up Singapore as a case study. What are the trade-offs in ethical, social and regulatory issues in bio medicine? How the notions of consent and privacy play out in the biomedical innovation system? For instance, how personal information is dealt with reference to insurance industry? With the increasing development of commercialization, what are the trade-offs between research, innovation, citizens and policy? A closely related issue is the way in which biological information

is shared and traded within and across countries. We will conclude by putting forward a case for responsible innovation in biomedical research.