Part III

Revolution of Knowledge Discovery, Dissemination, Translation Through Data Science

Connie W. Delaney

Big data and data science challenge our views of the universe, health care, nursing, and humanity. Data science challenges how we define, build and organize knowledge, re-examine knowledge transfer, and embrace systems that support local-to-global health and individual/family/community well being. These challenges and opportunities for redesign, re-imagination and inventiveness permeate our society’s vision of the core pillar of research/scholarship. These challenges and opportunities ask us to re-examine our policies and human, environmental, and financial investments. In this part the national transformation of research by the National Institutes of Health initiatives (Hardy and Bourne) is described, with a detailed nursing exemplar related to genomics and epigenetics (Daack-Hirsch). Kim and Selby discuss big data, networks and people-centric enhanced science empowered through the Patient-Centered Outcomes Research Institute (PCORI) initiate. New federal data resources that specifically empower big data-supported discoveries related to disparities are illustrated by Correa-de-Araujo. Translation of research discoveries and knowledge to practice and achieving clinical care excellence are exemplified by Troseth and team, while Landstrom presents a health system transformation supporting macro-level research-supported care. Finally, big data and data science demand a new look at knowledge discovery methods. Aliferis provides a succinct description of data analytics essential to realizing the benefits of big data in changing the outcomes, quality, costs, and patient and provider experiences in health care.