J-BHI Special Issue on "Big-Data for Health"
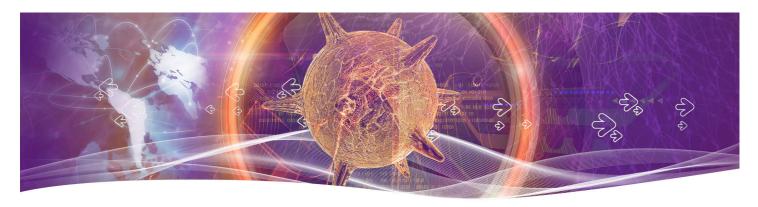
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Developments in the fields of biomedical and health informatics are driving major expansion in big-data, not only because of the sheer volume of information generated, but also due to the complexity, diversity, and the rich context of the data that encompasses discoveries from basic sciences to clinical translation, to health systems and large-scale population studies on determinants of health. This general trend also brings socio-legal implications. Whilst technological advances are overcoming many of the traditional barriers for transmitting, storing and sharing information securely, health data is growing faster than healthcare organizations can consume it. Managing, extracting, analysing, integrating, visualising and communicating useful information from the myriad of data generated continuously in real-time in addition to existing biomedical and health information represent major challenges in big-data research. A further important challenge relates to translation of analytical outputs to useful intelligence for more effective clinical decision-making and for policy formulation. New data analytic tools to facilitate scalable, accessible and sustainable data infrastructure for effective management of large, multiscale, multimodal, distributed and heterogeneous data sets and convert data into knowledge for support cost-effective decision aids, disease management, and care delivery need to be developed.

In promoting big-data as a source of innovation in healthcare and accelerating the translational pathways from the laboratory bench to the patient's bedside, the purpose of this special issue is to address the latest technical development and practical applications of big-data for health. Specific focus will be placed on the impact of big-data on bioinformatics, imaging informatics, sensor informatics, medical informatics and public health informatics, including initiatives that enable use of big-data analytics in health systems for improved clinical decision making, enhanced efficiency of care provision, policy development and policy implementation.

The topics of the special issue include, but are not limited to:

- Multiple-omics comparisons and analyses (inclusive of deep sequencing);
- Emerging informatics framework for big-data, as well as programming models and environments to support big-data for health;
- Big data analytics, machine learning algorithms and scalable/parallel algorithms (e.g. including the map-reduce paradigm) for biomedical and health informatics;
- Data fusion, integration, knowledge management and engineering; novel visualisation methods and scalable search architectures;
- Socio-legal and ethical issues related to big data in the context of privacy and security – data preservation, provenance, protection, as well as data integrity and privacy standards and policies;
- Incorporation of behavioural data through pervasive sensing and social media for promoting personal health, disease prevention and population health management;
- Applications of big-data for drug discovery and development, stratified patient management, targeted therapy and minimally invasive surgery, chronic and infectious diseases, outcomes research, coordinated care, environmental health, social health and informatics underpinning major disease management (e.g. neurological disorders, cancer, cardiovascular diseases, diabetes and obesity);
- Big data and analytics for improving management of healthcare institutions to enhance efficiency, effectiveness and equity;
- Novel approaches, with illustrative country case studies on use of big-data and innovative analytical approaches for measuring health system performance, policy analysis and development, and resource allocation.

Priorities will be given to papers reporting original work supported by large cohort studies with clearly demonstrated clinical translational values supplemented by on-line data sets or algorithms that can be shared by the research community.

Submission of manuscripts

Submitted articles must not have been previously published or currently submitted for journal publication elsewhere. As an author, you are responsible for understanding and adhering to our submission guidelines (http://jbhi.embs.org/for-authors/). When submitting, **authors are requested to choose "Big-Data" in the manuscript type to indicate that the paper is intended for this special issue.** The managing editor for coordinating this special issue is **Dr Carmen Poon**.