

Big Data in Medical Research

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This is the age of big data we are living in. Everything we are doing these are recorded somewhere and eventually that became a data for most of the organizations in today's world. The impact of data abundance is affecting all the fields including science and business in a positive way. The whole research world is drifting toward the data-driven discovery or decision making.

The big question to ask what is "Big data"? There are countless digital sensors in every device, equipment in anything. They are measuring and communicating location, movement, vibration, vital stats, etc to the companies. The amounts of data being collected and stored are expanding very rapidly. There is a huge revolution that came in the computation technology around these big data. Statistics and computer science are researching relentlessly towards meaningful data based decision making.

The medical research is also not far behind in terms of data collection. A survey by the American Hospital Association showed that the adoption of electronic health records has doubled the data collection from 2009 to 2012. Most of the electronic health record contains qualitative, quantitative and transactional data. These data can be analyzed to answer lots of clinical questions which were previously never explained properly to understand the disease much better than before.

Another important role that the big data research will play is in personalized medicine. As personalized medicine is the next big discovery in drug development, we are all seeking some novel technology/methodology to estimate the correct medicine to the individual patients. To estimate the doses more accurately, we need the patient's record.

Big data offers that the linkage between traditional health data with personal data collected using other norms (e.g., income, education, diet habits, exercise etc), can also be collected without asking the patient for hours. Current big data also process the flood of genome data; these data analysis can represent a patient's genetic profile which can be used to determine the most appropriate medical treatment.

The data driven medicine will open a new era of discovery of new treatment options based on molecular responses, and trends from patients' prognosis, diagnosis and adverse events from the databases.

But there is no free lunch in this world. Appropriate analysis of such data can be very challenging. However, one of the biggest challenges is still lies in with the technology. The storage of these huge data requires a lot of memory in the computer, in the current age, we are well equipped, but still not there in every sector.

Another challenge is the security and privacy of the data. Traditional ethical issues associated with any medical research concerning informed consent and the privacy of data subjects are always there. On top of it, the novel findings using big data can be misleading or ethically misunderstood to the patients. So there is definitely lot of uncertainty on the usage of patient data to establish novel methods to answer lot of medical questions.

Cardiology is one of the challenging and interesting fields in medical research. The society has seen many developments to save human life from cardiac arrest. But still there are lot of things to de done before this world can be declared as "cardiac-arrest free" world. With recent innovations of wearable technology, it is assisting us to measure heart beat every minutes which generates millions of data every minute. There are lots of scopes of innovation in terms of statistical methodology. This journal is the perfect platform for all the researchers to publish their work addressing key medical issues along with a proper statistical analysis and help us to make this world better for us.

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