Big Data Analytics: How is it Changing Lives?

Damian Mingle, Chief Data Scientist at WPC Healthcare, presented 4 reasons for Big Data on www.cio.com on 10 November 2015. The reasons were stated in terms of the benefits yielded by four types of healthcare data: Hospital Claims Data, Clinical Data, Pharma R&D Data, as well as Patient Behavior and Sentiment Data.

Let's zoom in on Hospital Claims Data in the United States. Basic data such as 125.7 million patient department visits and 136.3 million emergency department visits cited in the 2011 National Hospital Ambulatory Medical Care Survey could be used to predict patterns. The same can be said of the 35.1 million discharges with an average 4.8 days' stay stated in the 2010 National Hospital Discharge Survey. Mingle suggested using a combination of descriptive statistics, exploratory data statistics and predictive analytics to discover the most cost-effective treatments for specific health problems and treatments, or even to change behaviour patterns.

As Mingle pointed out, there are many kinds of data and ways of exploiting data. In order to focus our discussion, we will discuss mainly Big Data and Data Analytics in this article.

Simply stated, Big Data is all the data available to provide new insights to a problem. Big Data comes in such volume and velocity that they are difficult to manage with traditional software or hardware. Data Analysis is the science of examining raw (big) data with the purpose of drawing conclusions about that information and enable organization to make better business decisions.

According to a Forbes report released on 25 May 2015, Wikibon forecast that big data would reach US$84.69 billion by 2026 while Frost and Sullivan estimated the figure to be much higher at US$122 billion by 2025.

(Original Wikibon graphic used in Forbes report for HIMSS APAC’s reference and adaptation):

Did you know?

- 90% of data in the world has been created in the last two years alone
- Global data traffic to cross 100 zettabytes annually by 2025
- Global big data market to generate a revenue of over $122 billion by 2025
The significance of the 3521 plan is that patients will ultimately be able to access their personal health data at any one of the many healthcare settings serving their region.

Damjan P. Denoble of Health Intel Asia highlighted that security of healthcare information would be a great concern. However, he remained optimistic that technical and infrastructure issues would be solved over time. He wrote, “cloud computing technologies will mature, security issues will be fixed, and the creation of large data centers capable of storing growing petabytes of healthcare information will be gradually expanded.”

Instead, Denoble believed that the toughest challenge was how to provide value add services through efficient analysis of the massive data that the upgrade of health information systems was going to set free from the confines of internal hospital systems, citing Zhou Baoyao, the Director of Research at the EMC Chinese Academy Big Data Laboratory.

How about closer to home in Southeast Asia? With 255 million people and more to come, Indonesia's healthcare industry sees great growth potential. Indonesian healthcare operator, Bundamedik Healthcare System, is using Big Data and Analytics at one of its hospitals in the country – RSIA Bunda Jakarta.

The hospital is applying analytics to aid decision-making for critical financial business processes including budgeting, reporting, score-carding, analysis and forecasting. Now, Bundamedik is able to get a more complete and accurate picture on the overall spending and budget status at RSIA Bunda Jakarta. This will help support growth plans by ensuring the resources of the hospital are aligned with corporate objectives.

Over here in Singapore, useful measures have been implemented after applying data analytics to issues or problems. Khoo Teck Puat Hospital (KTPH), for instance, realized that data collected while screening for obstructive sleep apnea, a sleep disorder in which breathing repeatedly stops and starts during sleep, could be used in the planning of critical care admission after surgeries. It was discovered that people with a history of the disorder face much greater risk when they undergo surgery, especially under anaesthesia.

KTPH's healthcare analytics and anesthesia departments administered the questionnaire used for data collection, called STOP-BANG, to 5,432 patients who had elective surgery in 2011, of whom 338 were admitted after surgery to critical care. The study began some four years ago. Since then, the screening tool has been used on all KTPH patients undergoing surgery in order to forecast possible complications during surgery and intensive care admissions.
At Changi General Hospital (CGH), tweaks have been to its Health Management Unit tele-health programme after data analytics of diabetic patients revealed that it was patients with poorly controlled diabetes who benefited most from the periodic phone calls from nurses. Enrolment criteria was thus revised. Resources were then re-assigned where and when most needed.

CHG’s data analytics team also proposed changes to match arrival patterns of patients. They suggested more overlap in doctors’ shifts during the peak hours of around 10am and 7pm to 8pm. Average median time to first consultation for patients with more serious conditions dropped from 33 to 25 minutes. Doctors have also reported a qualitative improvement in their workload.

Global Analytics Market

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Global Text Analytics Market
(Segmentation and Forecast, 2013 - 2020)

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**Webinar Leader:** Chang Polun, PhD, Professor, Institute of BioMedical Informatics and School of Nursing  
**Director, Integrated Health Care Research Center**  
**National Yang-Ming University**  
**Date:** Thursday, 3 December 2015  
**Time:** 4pm - 5pm, Singapore time  
Click [here](#) for registration details.

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**HIMSS AsiaPac 16**  
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Queen Sirikit National Convention Center, Bangkok, Thailand