



7 Big Data Steps in Health Science

By Chris Pehura

Every year we go to our doctor to get checked out. And being really busy, our doctor has only minutes to complete an examination and do a preemptive strike on any health ailments that we personally may be facing in the next few years. But did you know... to not miss anything our doctor is getting help from Big Data? With the rising costs from R&D and us getting longer life-spans, Big Data is becoming more entrenched and more crucial to reducing the investment needed to keep us healthy. But, how does Big Data actually do this?

From a bird's eye view Big Data encompasses seven steps. Understanding these steps will help us better leverage Big Data. Not only that, we'll feel more comfortable sharing our health information and be better prepared to place stricter regulations on which of our health data should be collected and when. Let's take a look at these seven steps in detail.

1. Sources. The sources for health data can be our bodies, where we are, what we're doing, and what we eat. This includes if we're sitting or standing, exercising, our Google searches, our pulse rate, blood pressure, cholesterol, and blood sugar.

2. Collection. With the use of sensors, implants, and our mobile devices, our health data is collected once a second, once an hour, or even just once a day. Our data isn't collected all in one shot. We're being monitored. Our data is continuously being collected and recollected at the right volume. The right volume depends on the individual, the ailment we have, and our physical behaviors and culture.

3. Model, Algorithms, Artificial Intelligence. Our health data is fed to fit the model, a representation of how health experts understand health. The model is supported by algorithms and artificial intelligence (AI) that uses automation to process, predict, and forecast our health. The model may contain health scenarios such as a viral outbreaks, the spread of cancer, or reactions to a drug or surgical treatment. The model was constructed and refined by medical experts, behavior experts, statisticians, and data scientists... all analyzing past health data on events and people just like us who had similar, if not the same, diagnosis. After algorithms find where we fit in the model, algorithms share our forecast data with medical experts.

4. Options. From our forecast data the medical experts determine the options available. If there is an advanced AI, the AI may order or rank options according to an estimated effectiveness. If there is an even more advanced AI involved, the AI may recommend the medical experts to select specific options, decisions, and methods of treatment.

5. Decision. From the options determined the medical experts select the most appropriate option for our specific case. To make a good decision the experts need to accurately interpret the results from the model, algorithms, and AI. This means the medical experts need to understand Big Data, how Big Data works, and Big Data's shortcomings.

6. Methods. After completing a formal approval to meet ethics and regulatory compliance, to keep us healthy the needed approaches, treatments, and regimens are carried out. If there is an advanced AI involved, the majority of the manual efforts, such as orders, scheduling, and communications may be automated.

7. Measurements. During and after our treatment, measurements are collected to anticipate how well we'll respond to our treatment in the short and long term and forecast any negative scenarios we may encounter. Our new health data from our actual health and from these predictions, forecasts, and measurements are then feed back into the model to add to the

model's accuracy for forecasting future patients, future events, and our future treatments.

Big Data has proved itself over and over for keeping us healthy. From mapping out what our bodies look like when we're well, to how our bodies degrade when we're sick, to how disease spreads in our bodies, to how diseases spread on a global scale. But Big Data is just another tool. And like any tool, we must rely heavily on the knowledge and training of our tool user, our health practitioner, to keep us all healthy.

Health Science must be trained in Data Science.

About the Author



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Chris is a management consultant with a data emphasis helping Fortune 100/1000 companies strategically evolve and reinvent their businesses to maximize their revenue growth. Through realignment, to overhauls, to rebuilding things from the top down and ground up, he integrates and solidifies leaders, strategies, and solutions into all aspects of the organization. As practice director for [C-SUITE DATA](#), a Canadian based consulting firm specializing in data and Big Data, Chris serves as a coach, trainer, and the voice for how data is the new capital that drives, multiplies, and maximizes revenue growth.



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