# Innovative USE OF DATA

*As patients adopt digital in their daily lives, the data that are being generated can be utilized — with consent, or in an anonymized manner — to provide a complete view of the patient's health and well-being, along with how medication can become a part of that overall program.*

We now live in a data-generating world —particularly in the developed nations, where the ubiquitous smartphone is accepted as a personal device that is all-encompassing in our lives. This little device and its add-ons generate all manner of data about our lives and our movements. Everything from location to interests to self-reported details such as check-ins to restaurants. Everything we do on the phone is tagged, stored, and managed.

Our use on these devices and of social apps, such as Instagram, Foursquare, Facebook, and LinkedIn, as well as activities, such as searching for things, getting driving directions, and watching movies, is tagged creating an ability for commercial organizations to know more about us than ever before: our behavior, our likes, and, more importantly, our habits.

This has opened many doors for marketers to connect, in many cases, in a relevant manner with their customers. The folks in the auto and consumer goods businesses have figured this out well, as have retailers. We will see increasing use of geo-fenced offers, as well as NFC and iBeacon technologies, by these industries to provide personalized, relevant communication to their customers.

Data collection and analytics are even being applied to things like sports. The German soccer team relied on an SAP-developed solution called SAP Match Insights to track and capture everything they did on the field. This vast amount of data was then crunched into thousands of data points per second. The coaches would analyze players' speed, position, possession time, etc., via a mobile device. As we all know, they went on to win the World Cup.

## Can Healthcare Keep Pace?

While known to the healthcare industry, these tools and platforms have not been adopted in healthcare at a pace that matches other industries. Parts of the rationale behind this are privacy concerns and laws that prohibit or severely limit the collection and storage of personally identifiable information by healthcare entities. And part of it is a general lack of knowledge of how to do it for the benefit of the patient without violating the laws.

In the United States, HIPAA rules are pretty clear and could be referred to as the bill of rights for patients. These guidelines can be adopted well in the provision of healthcare to patients in this brave new world.

IBM pioneered the use of health data via its Watson group. Watson is the famous artificial intelligence (AI) computer that played chess and Jeopardy. IBM has now turned to healthcare and is applying this AI capability to big health issues. The first one it is tackling is cancer. By gathering all of the publicly available data on lung cancer, as well as specific patient-related data from Memorial Sloan Kettering and MD Anderson, IBM has been able to create a very complex and predictive decision-support tool for the treatment of cancer. The company claims to now be able to predict the potential number of people in the United States, by area, who may suffer this disease.

This has huge ramifications for treatment, medicine development, supply chains, and marketing in pharma. The more data IBM collects and puts into the Watson system, the better the prediction, and because these data are anonymized, pharma could use the information to better target patients, review supply potential, and determine a market size of potential patients.

The most interesting and groundbreaking thing about what IBM Watson is doing is applying the principles of predictive modeling and analysis to healthcare data. Combine this capability with a machine-learning technology that can analyze and learn from large data sets to predict and improve the outcome or behavior of a patient, and this will be revolutionary in the market and create all types of opportunities.

Google has one of the most visible and public examples of combing big data and predictive modeling. Its Google Flu Trends site uses search data and algorithms to show a trend of how flu is spreading around the world.

This algorithm and data set could be applied to other maladies, mapping trends for allergy-related searches during allergy season, and sunburn-related searches during the summer, showcasing patterns around the world. You can explore all of these phenomena using Google Insights for Search.

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## Data Personalization

Startups are popping up everywhere, seeking to create new models for using data and personalize patient outcomes. Companies such as Ginger.io and OneHealth use the data that are being generated by patients to create new models for managing health and wellness.

OneHealth combines gaming elements and a variety of online patient support networks that can be customized with active data collection. Personalized patient data are collected from within their communities, and dashboards are provided for feedback for behavior change.

Ginger.io collects data that already exist on the user's phone. Once the user installs his or her app, it sends data on calling, texting, and location, along with accelerometer data, to establish the user's normal patterns. Deviations from normal patterns can be used to predict early signs of disease. One example is the creation of algorithms that track changes in communication and movement to predict early signs of depression.

Even advocacy groups are getting involved. The American Society of Clinical Oncology is using a big data approach to create CancerLinQ, which contains the de-identified medical records of hundreds of thousands of cancer patients, to create a toolset to enable doctors to better diagnose rare cancers and share treatment information.

## The EHR/EMR Explosion

While all of the current noise in the healthcare industry is around wearable technologies and data collection, the biggest impact on patient outcomes and health management will be centered around EHR/EMR. More than 80% of U.S. hospitals have this technology, and in the last three years, EHR use has exploded, thanks to more than $20 billion in government-backed funding. The EHR adoption rate for office-based physicians is now hovering around 78%.

This technology will enable patients to have

## Memorial Sloan Kettering & IBM Watson: Advancing the Future of Personalized Cancer Care
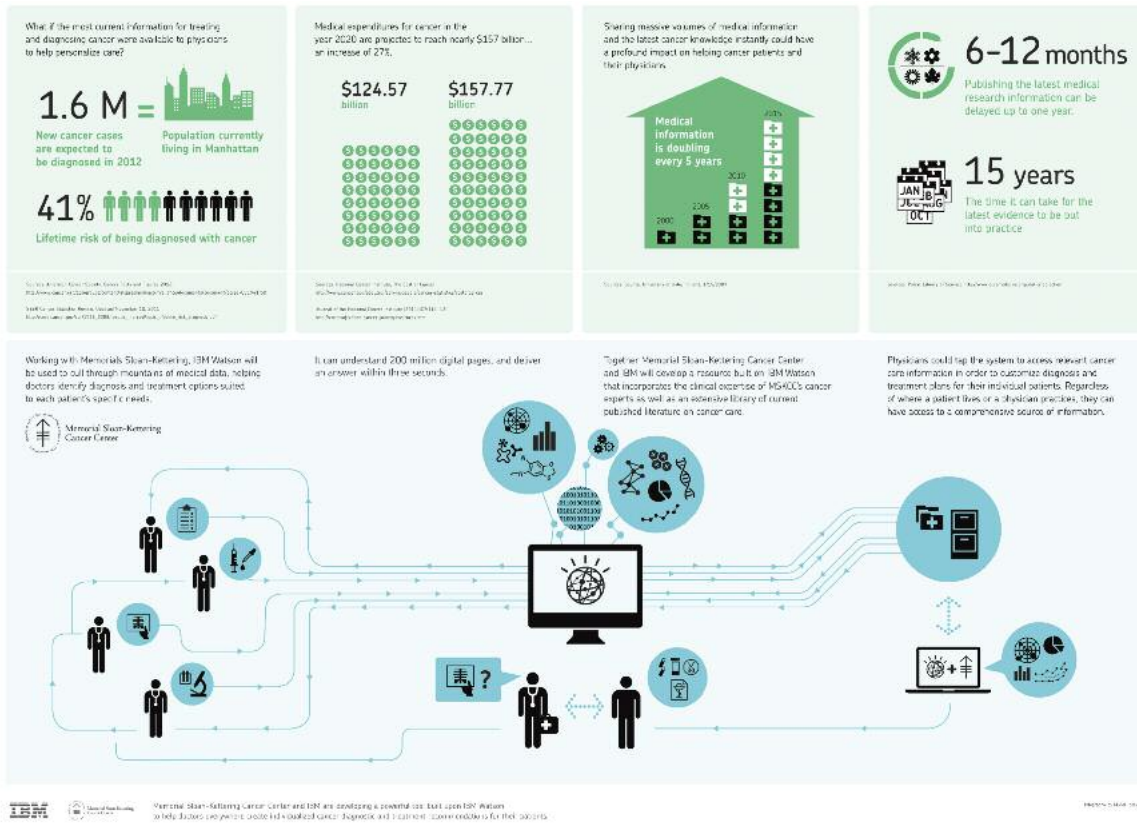


access to their data via patient portals, a major paradigm shift on how physicians and patients will manage their health communication. Not only will portals allow for streamlining patient management tasks, such as scheduling, but they will also enable the sharing of information from physicians, such as lab results and patient education materials.

A number of EHR providers are looking at ways to add data to the patient record easily. Drchrono is creating a wearable health record connecting Google Glass technology to the EHR. The app allows physicians — with a patient's consent — to use Google Glass to record a consultation or surgery. The app then lets the physician store the video, as well as photographs and notes, in the patient's EHR. The data also can be shared with the patient.

### Tracking for Success

Consumers have been adopting healthcare apps and tracking devices at a rapid pace over the last four years. The quantified-self movement has exploded, and people are increasingly tracking everything they do and modifying their behavior based on the data presented.

This is a global phenomenon and will only accelerate as our smartphones embed capabilities for monitoring our overall well-being into the overall experience.

The two major phone OS providers are rushing out toolkits to provide the ability to collect health data and store it. This will eventually allow us to integrate it with a patient record. Google announced Google Fit for the Android OS, and Apple announced the much-anticipated Apple HealthKit. Not to be left out, Samsung also announced a platform called S.A.M.I. for its phones.

Now imagine if patientd can add all this data from his or her wearable devices, apps on their smartphones, and other connected devices to their EHR to truly understand their overall health and wellness. The software kits will provide the capability of connecting the device to the EHR to help patients integrate their device data and allow their physician to monitor their health and wellness.

The impact on things like adherence and behavior change could be enormous.

The EHR offers a tremendous opportunity for patient outcomes, patient education, and drug adherence programs. Connecting it to wearables and devices, and creating a data set customized to the patient and his or her behavior will enable the realization of the personalized medicine dream.

Companies like Merck (merckengage.com) and GSK (healthcoach4me.com) are pioneering the ability to connect the data from these devices and apps to overall health and wellness for patients.

Sanofi and Bayer are focused on taking data from medical devices like asthma inhalers and insulin pumps and connecting this data to this digital ecosystem. Devices that connect to an app on a smartphone and upload data to the EHR will become the norm.

And then there are companies like Proteus Technology, that are focused on embedding a chip in a pill. The premise is that a chip that dissolves in the stomach is embedded into a pill. Once the pill is taken, the chip "broadcasts" all manner of data from within the stomach (including exactly when it hit the stomach) and that data are then added to an app on a smartphone and could be transferred to an EHR.

In summary, as patients adopt digital in their daily lives, the data that are being generated can be utilized — with consent, or in an anonymized manner — to provide a complete view of the patient's health and well-being, along with how medication can become a part of that overall program. These data can also be used for research, standard-of-care best practices, and marketing. 🅿️