BIG DATA AND POPULATION HEALTH
What you need to know.
If you’re like many physicians and practice managers, you’ve heard about “big data” and “population health” but may not be quite sure what they mean or how they relate to you. This guide will explain big data and how it’s being used to improve population health and further the transition to value-based medicine.
WHAT IS BIG DATA?

Big data in healthcare refers to electronic health data sets so large and complex that they can’t be easily managed with traditional tools and methods.

In 2011, the digital universe generated 1.8 zettabytes of data. That’s 1.8 trillion gigabytes, or enough data to fill 57.5 billion 32GB Apple iPads.¹

But we’re just getting warmed up: By 2020, International Data Corporation (IDC) estimates that the amount of data produced daily will exceed 40 zettabytes — 57 times the number of grains of sand on the earth.²
Analyzing huge amounts of data can uncover previously unknown facts and reveal unexpected connections. Organizations are using the insights they glean from big data in many ways, such as predicting customer behavior and buying habits, reducing financial fraud and improving business processes for greater efficiency and lower costs.

Healthcare also stands to benefit from big data, as providers and policymakers turn to big data to improve healthcare performance in a broad range of areas, including population health management.
WHAT IS POPULATION HEALTH?

Population health has been defined as the health outcomes of a group of individuals, including the distribution of such outcomes within the group. Improving health outcomes—as opposed to providing more treatments—is precisely the goal of value-based care, the keystone of healthcare reform. Providers are actively exploring ways of using big data to manage population health and make value-based care a reality.
THE FOUR V’S OF BIG DATA.

Big data is typically characterized by four V’s — volume, velocity, variety and veracity. In the context of healthcare, these terms can be defined as follows:

**VOLUME**

The amount of healthcare data created and stored. Electronic patient records, medical imagery, FDA clinical trial submissions and human genetics studies all contribute to the exponentially growing volume of big data.

**VELOCITY**

The speed at which data accumulates. Healthcare data’s velocity is increasing, putting pressure on healthcare providers to understand and act on data more quickly.

**VARIETY**

Healthcare data exist in many formats. About 15% of data are structured, such as test results or basic patient information. This data can be read by machines and stored in databases. The remaining 85% of data are unstructured. Unstructured data include doctors’ notes, imagery, recorded call center interactions and other records that don’t fit neatly into spreadsheets.

Relevant health data are also generated outside of healthcare settings, such as information from wearable devices and smartphone apps, which should also be added to the total data picture.

**VERACITY**

The accuracy of collected information. As the velocity and variety of data increase, maintaining accurate data such as patient names, reimbursement codes, prescriptions and more will become more difficult.

Based on Gartner research, 2001
BIG DATA HELPS MANAGE PATIENT RISK.

Collecting data alone doesn’t improve healthcare delivery or outcomes, but analyzing that data can reduce patient risk and improve delivery of care.

For example, mining big data allows providers to identify patients who are at risk for serious health conditions so they can take appropriate steps to proactively manage their care. This can lead to better health outcomes and lower costs.\(^iv\)

Combining big data with community data can also help identify and reduce risk. For example, mapping home addresses of patients who go to the emergency room for non-emergency conditions — such as a headache or sore throat — can identify neighborhoods where outreach services are needed to help residents get the right care without visiting an ER.\(^v\)
IMPROVING POPULATION HEALTH THROUGH DATA ANALYSIS.

Big data also has practical applications for populations at large, providing more information about disease progression and effectiveness of therapies to more physicians and researchers than ever before in history.

Using medical and genomic data, clinicians can, for example, recruit subjects to test innovative cancer treatments based on who is most likely to respond to the treatment well enough to complete the trial. Likewise, analyzing and comparing data from treatments on a particular set of patients helps providers determine which treatments offer the best outcomes at the lowest cost.
OBSTACLES LIMIT BIG DATA.

Bringing together trillions of data elements collected through various methods, locations and times isn’t without challenges. Some obstacles of big data include:

**Infrastructure**
Many healthcare organizations may not have sufficient IT infrastructure to manage, mine or maintain large amounts of data.

**Staff**
Healthcare organizations must contend with a shortage of staff members who are skilled in collecting and managing healthcare big data.

**Privacy & Security**
Although personal information can be removed before data are recorded, data privacy remains a constant concern. There are also questions about the ownership of health data, including how and by whom the data can be used.

**Culture**
Providers and administrators may be unsure of the benefits of big data and resistant to implementing it.
In order to extract insights from big data to improve healthcare, analysts must have access to vast amounts of data in formats that allow them to synthesize and analyze the information to reveal patterns and trends. The more healthcare providers who contribute data in usable formats, the more promise big data holds.

Practices that store patient records in interoperable EHR and practice management systems are well prepared to contribute to the big data movement. By transmitting information to data repositories, such as statewide immunization registries, or by participating in technology-based incentive programs, such as meaningful use, practices can provide the information necessary to fuel big data discoveries.
As data volume and analysis capabilities grow, big data is poised to transform the way healthcare providers use technology to gain clinical insight and further the transition to value-based care. Understanding and contributing to big data now will help you put it to work for your patients’ benefit in the years ahead.

With the right population health management solution, big data doesn’t have to be a big problem. Call or visit us online to learn how Greenway Community, Greenway Health’s population health management solution, enables providers to improve the health of entire communities and contribute to a better healthcare system driven by informed data.

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