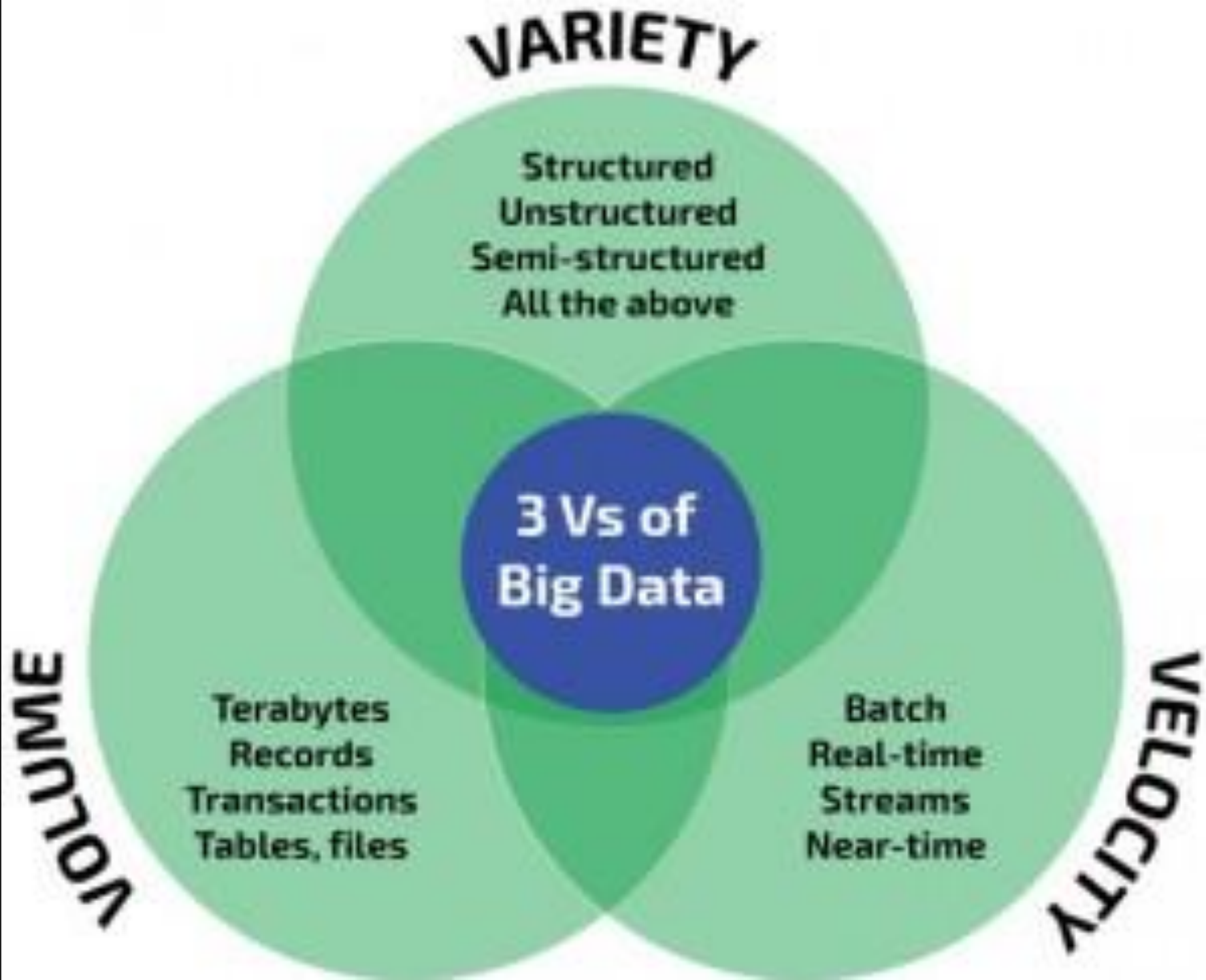Big Data

+

Healthcare

→

Achieving the Triple Aim

Lisa VanHoose, PhD, MPH, PT

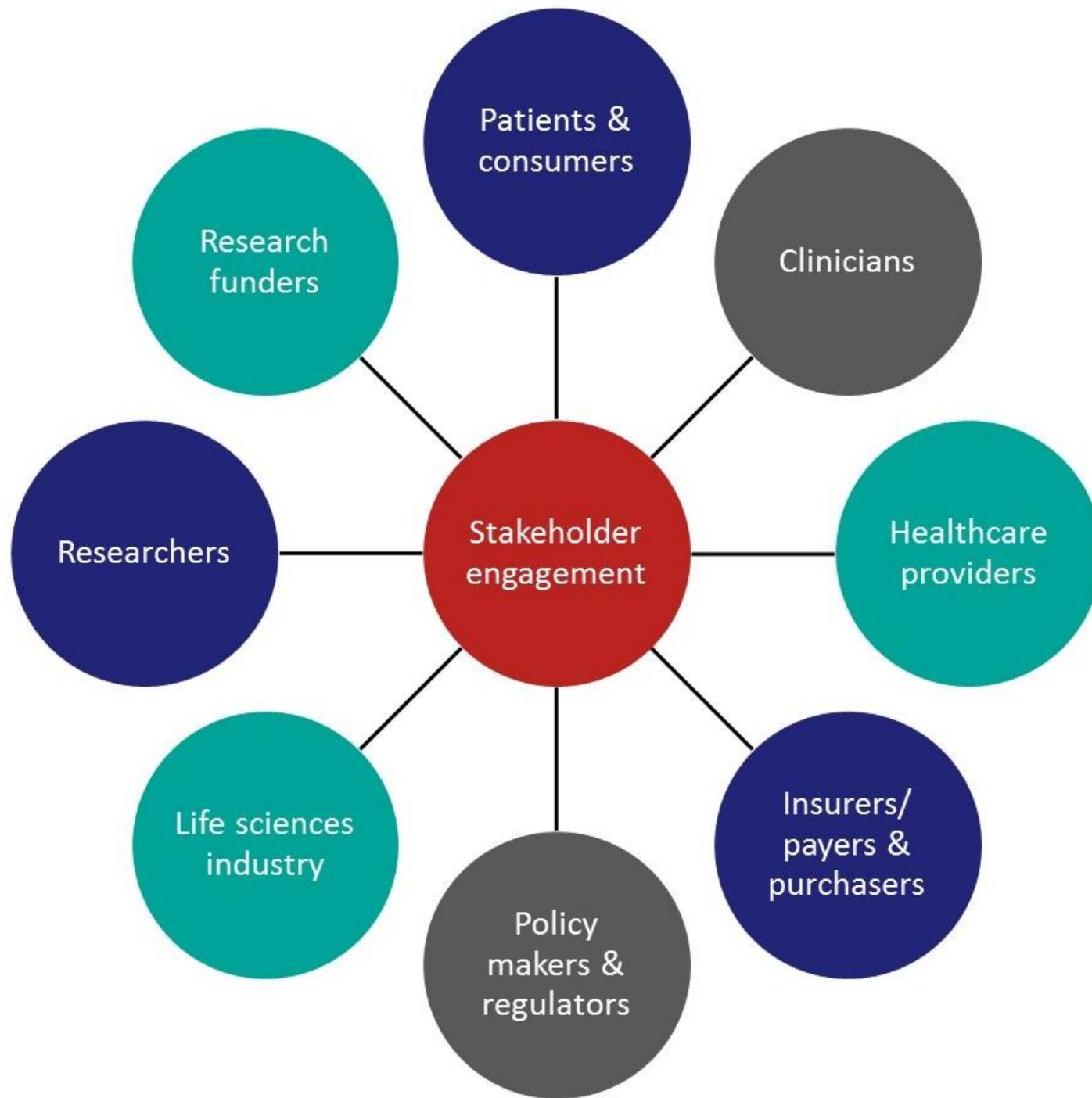UCA Physical Therapy Department

What is Big Data?

○ "Big data is a collection of data from traditional and digital sources inside and outside a company that represents a source for ongoing discovery and analysis."

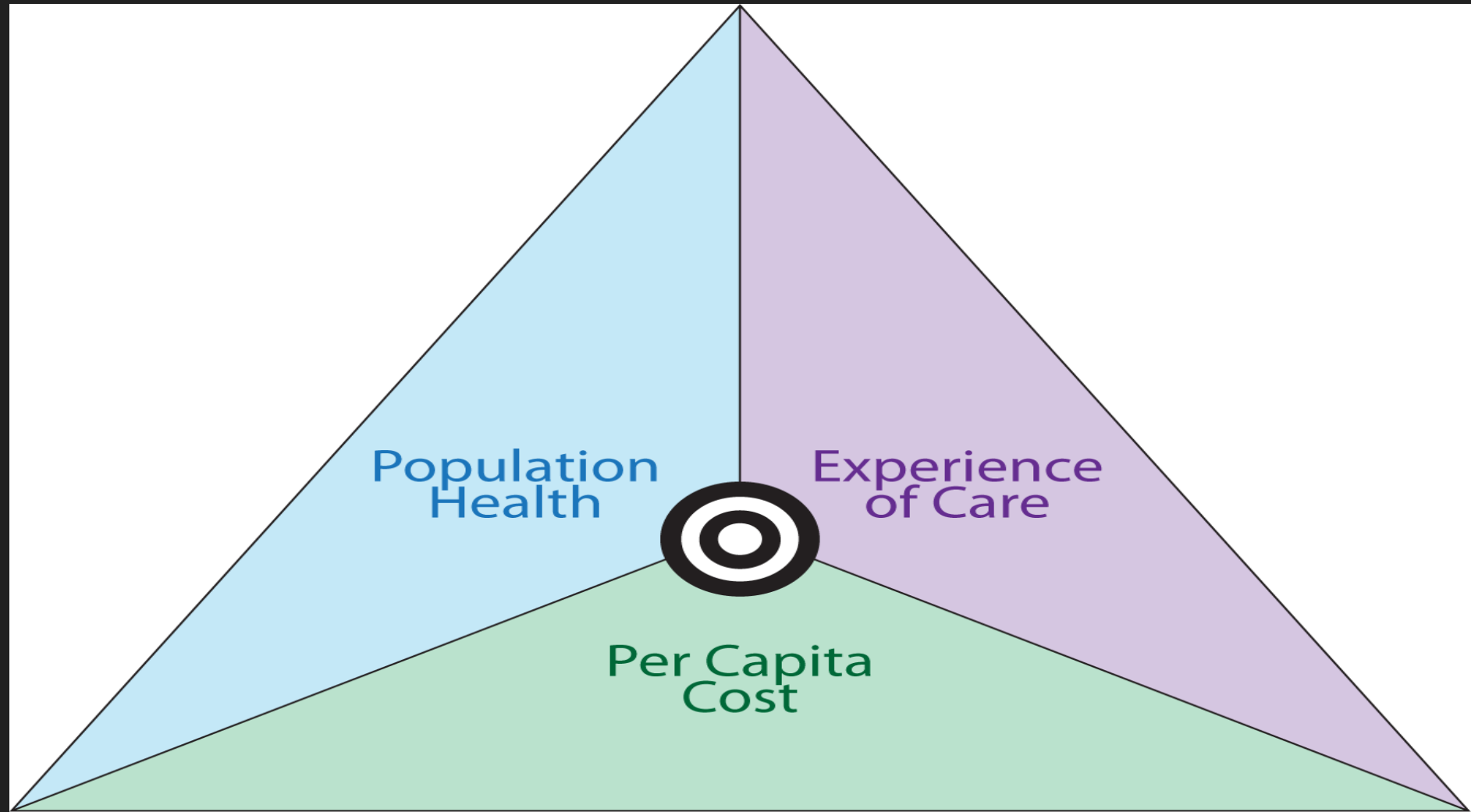○ Modified from: https://www.forbes.com/sites/lisaarthur/2013/08/15/what-is-big-data/#42b05a955c85

Source: http://sci2s.ugr.es/BigData

The Triple Aim

The Power of Healthcare Data

The Body as a Source of Big Data

Today data storage is essential for healthcare providers to see a patient's complete story of care, make the most informed decisions and enhance treatment and outcomes.

Access to electronic patient data beyond the desktop

3D MRI 150MB

The human genome requires approximately
3GB of data storage.[1]

X-RAY 30MB

MAMMOGRAMS 120MB

3D CT SCAN 1GB

0.5MB is generated

It is estimated that by 2015, the average hospital will generate
665TB of data[2]

There are currently **425K** telehealth providers in the U.S.[3]

PACS (picture archiving and communication systems) applications were cited as the number-one reason for healthcare data growth, at 63 percent, followed by files held in the electronic health record (54 percent) and scanned documents such as proof of insurance (51 percent)[4]

The Medicare and Medicaid Electronic Health Record Incentive Program now includes a measure for recording imaging results via certified EHR technology.[5]

Common uses of health care analytics: More accurate diagnoses, streamlining the cost of care, revenue reimbursement, outcomes and business analysis to manage populations[6]

36.6M Total admissions in U.S. registered hospitals, according to the American Hospital Association[7]

Medical image archives are increasing by
20-40% annually[8]

Today,
80% of data is unstructured, such as images, video and email.[9]

Sources
1 http://www.ornl.gov/sci/techresources/Human_Genome/faq/faqs1.shtml
2 http://www.emc.com/collateral/analyst-reports/ar-1195.pdf
3 BCC Research Global Market for Telemedicine Technologies (HLC016), March 2011
4 2011 International Healthcare Data Management Survey. Survey allowed respondents to choose more than one answer.
5 Markets and Markets Healthcare Data Analytics Market Research Report
6 http://www.emc.com/about/2013/04/05/healthcare-analytics-market-2012-to-healthcare-data-analytics
7 http://www.emc.com/leadership-and-analytics/solutions/healthcare.htm
8 American Hospital Association Statistics 2013 edition, published annually by Health Forum, an affiliate of the American Hospital Association, according to the 2011 survey
9 http://www.emc.com/collateral/about/news/idc-emc-digital-universe-2011-infographic.pdf (page 5)
10 http://www.cdw.com/newsroom/articles/big-data-challenge-or-opportunity.html

https://www.youtube.com/watch?v=_mXrZElpNMw

Big Data Usage

- Clinical Decision Support Systems
- Electronic Health Records
- Personal Health Records
- Remote Consultations
- Personalized Medicine
- Chronic Disease Management
- Preventive Application

https://www.youtube.com/watch?v=4W6zGmH_pOw

The Dark Side of Big Data and the IOT

- We want more and more data

- How do we store it

- Loss of control of your data and privacy

- Loss of informed consent

- The system favors big institutions and corporations over individuals

- May increase health disparities (income, racial, ethnicity, lifestyle choices)

- Law enforcement has increased its access and use of big data