

# NYU Health Care by the Numbers

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## Innovation Identified

NYUSoM has created **NYU Health Care by the Numbers (HCBTN)**, a flexible three-year, individualized, technology-enabled blended curriculum to train medical students in using big clinical data to improve care coordination and care quality. HCBTN emphasizes the use of big data and technology for patient and population management and empowers students to answer important clinical questions at the health care system-level.

The foundation of the curriculum is the use of **real clinical data**, which are derived from de-identified patient data gathered from NYU Langone's physician network practices and government-provided open data sources. These panels immerse students in the 'big clinical data' of our health care system - from the **2.5 million patients admitted each year** to New York hospitals to the individual patients seen in our outpatient clinics.

## Need/Gap Addressed

The goal of the NYU Health Care by the Numbers curriculum is to prepare our graduates to meet the future needs of the ever-evolving healthcare delivery system by giving them the tools and skills necessary to care for not just an individual patient, but for an entire population of patients. Specifically, we expect our medical students to:

- Develop skills to examine data across panels of patients,
- Recognize the strengths and pitfalls of big clinical databases, and
- Demonstrate the skills of using large clinical datasets to answer a clinical questions and improve care, quality, and the health care system

## Project Description

### HCBTN Resources:

- NY Statewide Planning and Research Cooperative System (SPARCS) dataset created specifically for the students:
  - All-payer data on 5 million patients discharged in all 227 NY hospitals in 2013 and 2014
  - Patient-level records including demographics, DRG codes, procedures, charges, length-of-stay, and more

### Student Projects:

- Students work in pairs to identify and investigate a clinical question using SPARCS data
  - Literature search, data description, cross-tabulations, and graphical visualizations
  - Students refine their hypothesis with a medical librarian and faculty preceptors
  - Faculty consultations are available for students in biostatistics, informatics, health care systems
- Students submit a structured abstract and deliver a 15 minute presentation to the class

## Project Evaluation

- Medical librarian and faculty experts provide formative feedback on the feasibility and quality of clinical questions
- Faculty preceptors and peers provide formative feedback on student presentations and abstracts
- Common themes across student projects are identified

### Payors, Clinical Outcomes and Dispositions for 54,000 CHF patients

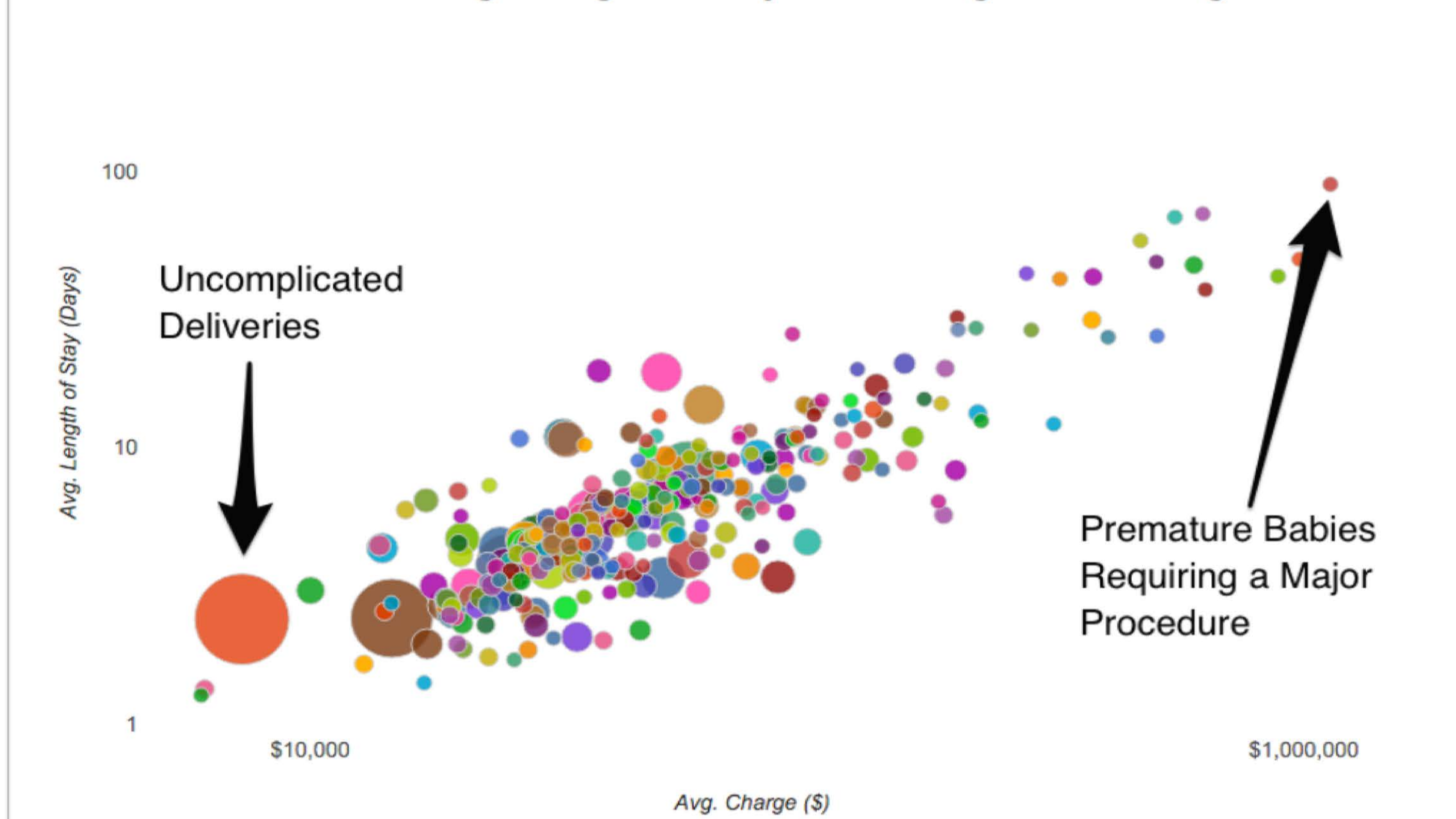
2014 Payors and Charges			
	\$36,847		
	2014 Average Charges per Admission Lowest: \$0 - Highest: \$4,302,120		
Payor	Avg. Charges	Avg. Costs	# Patients
Medicare	\$36,832	\$13,636	41,933
Medicaid	\$38,949	\$17,971	6,840
Private Health Insurance	\$35,598	\$13,616	2,204
Blue Cross/Blue Shield	\$37,642	\$13,713	1,983
Self-Pay	\$24,773	\$12,668	669
Managed Care, Unspecified	\$33,680	\$12,913	160
Federal/State/Local/VA	\$30,393	\$13,800	150
Miscellaneous/Other	\$23,135	\$9,186	134
Unknown	\$24,305	\$10,644	102
Department of Corrections	\$39,177	\$23,764	43

2014 Clinical Outcomes	
5.82 Days	2.52 / 4
2014 Average Length of Stay	
2014 Avg. Severity of Illness Score	
Patient Disposition:	Count
Home or Self Care	22,447
Home w/ Home Health Services	15,371
Skilled Nursing Home	8,728
Expired	2,172
Short-term Hospital	1,775
Left Against Medical Advice	1,015
Hospice - Home	684
Inpatient Rehabilitation Facility	634
Hospice - Medical Facility	616

### Most Common Admissions by DRG Code for 2014

Description	Count	Avg. LOS	Avg. Charges	Avg. Cost	Sum of all 2014 Patient Charges
NEONATE BIRTHWT >2499G, NORMAL NEWBORN OR NEONATE W OTHER PROBLEM	202,834	2.4	\$7,291.02	\$2,617.63	\$1,478,865,743
VAGINAL DELIVERY	149,626	2.4	\$14,597.30	\$6,609.20	\$2,184,134,500
SEPTICEMIA & DISSEMINATED INFECTIONS	84,721	8.2	\$57,544.10	\$22,095.20	\$4,875,191,739
CESAREAN DELIVERY	76,962	3.8	\$24,822.10	\$10,871.80	\$1,910,359,919
HEART FAILURE	54,218	5.8	\$36,847.40	\$14,163.10	\$1,997,791,842
OTHER PNEUMONIA	42,164	5.0	\$29,996.30	\$11,670.00	\$1,264,764,931
CHRONIC OBSTRUCTIVE PULMONARY DISEASE	41,538	4.8	\$28,459.40	\$11,200.10	\$1,182,144,567
CELLULITIS & OTHER BACTERIAL SKIN INFECTIONS	36,769	4.4	\$24,149.70	\$9,756.38	\$887,958,754
KNEE JOINT REPLACEMENT	36,503	3.4	\$51,377.00	\$21,922.30	\$1,875,415,449
SCHIZOPHRENIA	35,899	18.8	\$50,945.60	\$23,308.50	\$1,828,894,718
CARDIAC ARRHYTHMIA & CONDUCTION DISORDERS	32,996	3.6	\$25,290.60	\$9,168.44	\$834,488,642
HIP JOINT REPLACEMENT	31,304	4.0	\$57,490.30	\$23,734.80	\$1,799,676,656

### Correlation of Average Length of Stay and Average Total Charges for 2014



## Outcomes

- **To date, more than 500 NYU Medical Students have answered over 300 clinical questions**
- **Sample student questions:**
  - Does day of admission correlate with length-of-stay for CHF?
  - Does severity of illness score correlate with length-of-stay for patients with Drug and Alcohol dependence?
  - How does hospital level case-load relate to length-of-stay for those undergoing hip replacement?
  - Does a patient's race impact the rate of cardiac catheterization among patients admitted with acute MI?

Curriculum and clinical data are freely available at:  
<http://ace.iime.cloud>

