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Title:
The Power of Data: What is the Responsibility of Health Care in the Era of Big Data Analysis?

Abstract:
In 2013, Dr. Jeffrey Brenner became a MacArthur Fellow. The work that he conducted to earn this prestigious award was coined "Hot Spots." Hot Spots, in this context, are spatio-temporal clusters of high-need, high-cost (HNHC) patients. Often HNHC patients represent less than 10% of the patient population but can exceed 80% of the health-care costs with most of these patients being uninsured. Uninsured health-care costs for large health-care centers can be greater than $100 million per year. With the advent of electronic medical records (EMR) and geographic information systems (GIS), hot spots of uninsured, HNHC patients can be rapidly identified. We partnered with a large health-care system to analyze EMR data to assess spatio-temporal patterns of uninsured use. We discovered that uninsured usage of the system's emergency department (ED) resulted in huge cost-burdens connected to chronic diseases. For example, over four years, uninsured visits to the ED resulted in over $200 million (~20% of total costs) associated with hypertension. Further, over 50% of uninsured costs to the ED were related to chronic conditions/diseases. Because GIS has the power to geo-temporally locate hot spots of costs and diseases, the locations and persistence of uninsured HNHC patients can be known to a remarkably high degree of accuracy. Such analyses as these can be conducted in a very short amount of time with easily generated data from EMR. What is a health-care system's responsibility when susceptible populations can be rapidly elucidated? If much of the costs associated with HNHC patients are a result of chronic conditions that are themselves associated with social-determinants of health, what responsibility does a health-care system have to assuaging these determinants, if any? In the end, it appears that addressing these health-care cost issues is not a short-coming of health-technology and practice, but health-care culture and ethics.