

# Analysis Using Identical Patient Types Across Providers and the Implications for the Health Care Supply Chain

*Breanne Cameron, Cambio Technologies, USA*

*Fay Cobb Payton, North Carolina State University, USA*

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## ABSTRACT

*Along the health care supply chain, cost and quality measures are vital in the decision-making process for treatment and care delivery. This study applies statistical significance to a hypothesis about cost effectiveness of patients' total charges by health insurance providers for different heart conditions. A retrospective, observational analysis of data is collected from an urban hospital in the Southeastern United States. Using the Agency for Healthcare Research and Quality (AHRQ) database, diagnoses are selected for further analysis based on their prevalence in the general population. The numbers of procedures as well as the patient's length of stay in the hospital are significantly higher among the Medicare population. However, results indicate that although Medicaid and Medicare have significantly higher ordinary average total charges than the private counterparts, the difference is negligible when comparing means adjusted to remove covariate influence. One implication is that if private insurers were to insure the same types of high risk patients as Medicare and Medicaid the average total charges of a visit would be comparable between providers. These results also suggest that to enhance cost saving measures in government funded insurance programs, the clinical pathways need to be adapted to reduce length of stay and number of procedures per visit.*

*Keywords: Health Care Supply Chain, Health Insurance, Heart Disease, Medicaid, Medicare, Private Health Insurance*

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## INTRODUCTION

The national motivation to make health care more cost effective and affordable is not novel to the United States. The issue was brought into the American political spectrum in 1912 by Theodore Roosevelt, although he believed

this should not be an issue for the government to tackle (Goodridge, 2007). In 1945, however, President Truman publicly addressed the need for a national health care plan to United States Congress (Igel, 2008). Given escalating health costs during the last few decades, much of the focus has been on what entity should shoulder the cost for national health insurance and how citizens should be transitioned to such a plan. Currently, in the U.S. Congress, the goal is to

DOI: 10.4018/jhdri.2011010103

create a government-funded insurance plan to compete with private insurers, and one school of thought is to expand upon the already existing Medicare and Medicaid programs.

The Centers for Medicare and Medicaid estimate that health care spending accounted for a record 16.2% of the United State's gross domestic product in 2008; this translates to \$2.3 trillion (U.S. Department of Health and Human Services Centers for Medicare and Medicaid, 2011). The cost of cardiovascular disease in that year was \$448.5 billion, 19.5% of the total health care spending (American Heart Association, 2008). Coronary artery disease (CAD) was the most expensive diagnosis followed by acute myocardial infarction (AMI) and *congestive heart failure* (CHF). Non-specified (NOS) chest pain also appears on the list of conditions associated with health disease. In 2004, these medical conditions accounted for 14% of the nation's health care expenditures and included the most expensive circulatory diseases that impact heart conditions, such as coronary heart disease and hypertension (Russo et al., 2007).

We posit that these insurance plans and the differences between them is the crux of any care delivery process. Critical to these care delivery processes are the relationships among costs, providers and chronic diseases, such as heart disease and related conditions. To this extent, the development of care and the delivery of care span a supply chain which cannot be absent of health care finance and cost evaluations. The development and delivery of care are influencing factors in treatment decision-making. As Charles, Gafni, and Whelan (1999) delineated, there are varied models of treatment decision-making in health care, particularly in the context of life threatening illnesses.

Evidence from this analysis suggests that by possibly replicating (in part) the structure and policy of private insurance companies, Medicare and Medicaid can, in the long run, provide health insurance coverage with foci on cost effectiveness and high quality. We will provide evidence that indicates that if programs, like Medicare and Medicaid, were

to insure the same types of patients as private insurers, and then the cost of a clinic visit for a heart disease condition or diagnosis would not be significantly higher. Sharing the costliness of high-risk cardiovascular patients with private insurers would lower the proportion of the national budget allocated for Medicare and Medicaid programs.

## LITERATURE REVIEW

Sinha and Kohnke (2009) took a macro level approach to examining the health care supply chain design. Their 3A-framework (access, affordability, and awareness) directly or indirectly relies on the success and improvement of the health care insurance industry either through direct financial affordability or limitations to access and awareness. Key to improvements in the care delivery process, they indicated that care is a bundle which informs the design of the supply chain for the health care sector. Figure 1 illustrates the Sinha and Kohnke (2009) supply chain for health care. Critical to this figure is the interdependencies among pharmaceutical, medical device and biotechnology stakeholders. Given these interdependencies, upstream and downstream costs will impact decision-making along the supply chain. Hence, a micro level analysis of associated costs among providers treating chronic diseases, such as CVD, AMI, NOS chest pain and atherosclerosis influences decision-making and warrants investigation.

Further, health care finance initiatives serve as the bridge that brings the development of care to the delivery of care. Sinha and Kohnke (2009) suggested that "the fragmentation and the inefficiencies of the health care sector at-large can be attributed, in part, to ignoring these interdependencies" (p. 201). We argue that because health care finance is the link between development and delivery that the fragmentation and inefficiencies of the health insurance industry are largely to blame for the disjointed health care supply chain.

The authors also conclude that the affordability of CVD care for patients of developing

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