Performance Evaluation of Hospitals’ Emergency Departments using a Modified American Productivity and Quality Center Approach

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ABSTRACT

Presented is a modification of the American Productivity and Quality Center (APQC) approach to the performance evaluation of hospital emergency departments. This modified approach allows individual hospitals to make better estimates of cost containment and productivity relative to an industry-wide benchmark, by using patient acuity to convert conventional performance data into two measurements: an efficiency indicator and a price recovery ratio to better facilitate the establishment of a cost-quality connection.

Keywords: Accounting, American Productivity and Quality Center (APQC), Cost Control, Emergency Department, Healthcare, Hospitals

INTRODUCTION

The healthcare industry constitutes a significant and increasing share of gross domestic product in the United States, yet it struggles to control costs while simultaneously increasing productivity. Hospital costs in 2008 accounted for 30.7% of total health expenditures, increasing from $9.2 billion in 1960 to $718.4 billion in 2008, the last year for which data is available (National Center for Health Statistics, 2011). It has been estimated that (Gaul, 2005), between 33% to 40% of Medicare’s $300 billion annual third party payment in 2005 was wasted on inefficient healthcare expenditures, and that year Medicare spending accounted for 20.5% of total healthcare expenditures in the U.S. (National Center for Health Statistics, 2010). Significant cross-sectional variation exists in healthcare costs between hospitals and regions (Bopp & Cebula, 2009), and thus there have been numerous calls in the literature for better
hospital efficiency (Harrison & Ogniewski, 2005; Hsu & Hu, 2007; Kumar & Nunne, 2008) and performance analysis (Weng et al., 2009).

For decades, hospitals were reimbursed via a fee-for-service system, which rewarded production with very little regard for efficiency. The introduction of the diagnosis-related-group (DRG) prospective payment system by Medicare in 1983 produced major changes in the efficiency emphasis of hospitals (Chalos, 1993), as the DRG system paid hospitals for patient stays based upon diagnosis, not individual treatments received during a particular inpatient stay. The DRG system thus necessitated that hospitals evaluate (or at least consider) patient types in terms of cost and profitability. There seems little relationship between healthcare costs and quality: in 2001 Louisiana ranked highest in Medicare cost and fifth lowest in healthcare quality while New Hampshire ranked highest in healthcare quality but 47th in terms of cost (Scott, 2005). These kinds of discrepancies should compel hospitals to examine productivity vis-à-vis costs (i.e., efficiency) more carefully.

While hospitals emphasize management of DRG product lines, this approach does not directly address hospital emergency department productivity, despite the fact that emergency departments accounted for approximately 40% of hospital admissions in 2000 (Breslin, 2003), and more recently it was reported in one hospital that over 47% of admissions was due to emergency department patients (Henneman, 2009). Because various studies (Eldenberg & Kallapur, 1997; Folland & Hofler, 2001) have demonstrated hospital administrators’ manipulation of budgeted patient volume, variable costs and contractual adjustments, it is vital to ensure that cost controls relate to productivity objectives. We divide conventional profitability into productivity, cost and price recovery components. The inclusion of the price change ratio eliminates the confounding effect of changes in sales which could distort the other two ratios, a problem which exists in traditional productivity measurement approaches (Bankar, Datar, & Kaplan, 1989). The productivity change ratio is used to measure the technical efficiency of the firm, and the cost and price recovery change ratios measure profitability changes due to product cost margins. We propose a modified APQC approach to better measure the productivity and profitability performance of emergency departments of hospitals. The paper illustrates the incremental information content that can be derived from conventional performance data by adopting this modified APQC approach.

The next section theoretically distinguishes operational and financial measures of performance. Then, we provide field data of a conventional hospital emergency department product performance system. Afterwards, we explain the APQC approach. We modify the APQC approach by incorporating the effect of patient acuity in hospital emergency department productivity and profitability. Finally we conclude the paper.

### PRODUCTIVITY AND PROFITABILITY

Productive efficiency is an economic measure to evaluate how well an organization is utilizing resources to generate outcomes. There has been an increasing interest in measuring the productive performance of healthcare services. In frontier efficiency studies, actual inputs relative to outputs by unit are multi-dimensionally compared to the best unit performer, defined as the efficiency frontier. Frontier studies are conceptually closer than ratio analysis to true technical and allocation efficiency.

Comprehensive research has been undertaken on frontier measurement of hospital productivity using Data Envelopment Analysis (DEA) (see Hollingsworth, 2003 for a review). DEA is a multicriteria non-parametric linear programming technique for comparing efficiency of decision-making units, in this case, hospitals’ Emergency Departments. It allows the determination of the relative best practice hospitals in the observation set and, by comparison, the relatively inefficient ones (Al-Shammari, 1999). In addition, it indicates the magnitude of these inefficiencies. Some applications of
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