A Study on Service Quality Performance of Sicilian Hospitals

Uno studio sulle performance di strutture ospedaliere operanti in Sicilia

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Riassunto: L'obiettivo del presente lavoro consiste nel confronto delle performance dei presidi ospedalieri che fanno capo all'AUSL 6 di Palermo. Si prendono in esame le seguenti aree chiave: l'efficienza di allocazione delle risorse, l'erogazione di servizi appropriati, l'efficienza produttiva, e con riferimento ad esse vengono individuati opportuni indicatori di struttura ed outcome clinici; tali misure intendono dunque valutare diversi aspetti del funzionamento degli ospedali. La comparabilità dei risultati delle diverse strutture, che costituisc un passo fondamentale verso l'attuazione di processi di benchmarking, prevede l'utilizzo di metodologie di risk adjustment: l'utilizzo di modelli multilevel permette di identificare e tenere conto di variabili di confondimento sia a livello del paziente (caratteristiche individuali e variabili cliniche relative allo stato di salute al momento del ricovero) sia a livello di ospedale.

Keywords: hospital performance, multilevel model, risk adjustment.

1. Introduction

In recent years it has become increasingly important to health care executives to understand what kind of facility, equipment, and workforce decisions are critical to achieve the commonly acknowledged goal of providing quality health service at a reasonable cost.

In the present study, based upon 2006 hospitalization data, we make a comparison among the eight hospitals of the Local Health Agency AUSL 6, located in the province of Palermo; we used data on hospital discharges from the SDO register and data from hospitals administrative sources.

We consider performance measures in a multilevel setting, comparing outcome after adjusting for confounding factors. In taking this approach, we seek to address several problems associated with the presence of missing data and the presence of repeated admissions of the same patient in the same or in different structure of the AUSL 6 (multiple membership structures).

2. Performance Measures and Multilevel Models

A hospitals measure of performance, also referred to as a performance rate, shows the percentage of patients who are given the right care at the right time for a specific medical

condition. There is no universally accepted performance measure; here we consider performance measures related to the use of resources to provide care (structure) and measures aimed at evaluating results (outcome).

As performance measurement falling into the first category we adopt occupancy rate, the average utilization rate of hospital beds; previous researches in literature shows this measure is a significant indicator of hospital viability. We propose an aggregate level analysis, by averaging over all patient in each hospital to investigate the presence of hospital effect in occupancy rate after we control for explanatory variables.

Outcome Indicators followed the Institute of Medicines definition of quality, which is the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge (Institute of Medicine 2001). In-hospital mortality is frequently used as an outcomes measure, but it's often judged inappropriate for the purpose of comparing performance; moreover outcomes of patients discharged or transferred to other facilities may not be captured in reports of in-hospital mortality.

We create an outcome indicator based on SDO information, that is a binary response at patient level, whose positive value (=1) occurs whether the patient is discharged with an *ordinary discharge* (or *discharge home*). Outcome measures are typically difficult to interpret because they can be significantly affected by patient characteristics such as age, initial health status, lifestyle, etc. Moreover in the comparison of performance, differences among the structures may lead to a potential bias in estimating the hospital effects. A procedure of risk adjustment explicitly controls for these shortcomings. This motivates the choice of a generalized linear model, where the expected proportion is modelled using a logit link function and with the standard assumption that the observed proportions are binomially distributed. The explanatory variables are measured at patient level and hospital level; we would expect an "'extra binomial variation'" at the individual level due to omission of an intermediate level between patient and hospital, that is the level *Unit* of the hospital.

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