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## Are more resources always the answer? A supply and demand analysis for public health services in Brazilian municipalities

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### Abstract

The aim of this paper is to determine whether it is necessary to increase available resources to local governments or if better use of these funds is sufficient. The paper contributes to the literature by looking both at the supply and demand for public health services. If the demand is estimated correctly, one can compare its expected value to actual health expenditures. Even if actual expenditures are lower than the estimated demand, it is not certain that additional spending is necessary. If the efficiency scores (supply side) indicate that local governments can simply “save” resources to make up for the difference, then it is possible to reduce (or bring to zero) new resources only by requiring local governments to efficiently manage their expenditures. Since municipalities in Brazil are very heterogeneous, we estimate their efficiency using the metafrontier approach (O’Donnell et al., 2008), while we estimate the demand through an equation derived from the median voter theorem model. Using 2010 data, we find evidence that efficient management of spending is sufficient to meet excess demand for goods and services in the health sector.

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*Palavras-chaves:* saúde; municípios; metafronteira; análise envoltória de dados; eleitor mediano; regressão quantílicas

### Resumo

O objetivo deste artigo é avaliar se é necessário aumentar os recursos disponíveis para os governos locais, ou se o melhor uso desses recursos é suficiente. Esse estudo contribui à literatura, tanto na oferta quanto na demanda de serviços públicos em saúde. Se a demanda é estimada corretamente, é possível comparar o valor previsto da demanda com o gasto efetivamente realizado em saúde. Se o gasto efetivamente realizado é menor do que o gasto demandado, não haverá, a princípio, necessidade de gastos adicionais. Se os escores de eficiência (lado da oferta) indicarem que os governos locais podem simplesmente “economizar” recursos para compensar a diferença, então é possível reduzir (ou trazer a zero) novos recursos apenas exigindo que os governos locais gerenciem eficientemente suas despesas. Uma vez que os municípios no Brasil são muito heterogêneos, estimamos sua eficiência usando a abordagem de metafronteira (O’Donnell et al., 2008), enquanto estimamos a demanda através de uma equação derivada do modelo

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do teorema do eleitor mediano. Usando dados de 2010, encontramos evidências de que uma gestão eficiente dos gastos é suficiente para atender à demanda excessiva de bens e serviços no setor de saúde.

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## 1. Introduction

To enhance service delivery, the Brazilian Constitution of 1988 transferred the responsibility for health and basic education provision to local governments. The federal government was made responsible for establishing health policy guidelines, while states and municipalities became responsible for putting them into practice. Although financing should also be shared, only the federal government's role was established by the transient constitutional provisions, determining that 30% of the social security budget must be allocated to the health sector.

The early 1990s health financing crisis can be explained by the lack of a clear distribution of tasks among federal, state, and local governments, by the lack of strong revenue sources and by the limited commitment of each level of government to expenditure financing. Consequently, some changes in the constitutional text were suggested, giving rise to Constitutional Amendment no. 29/2000, which established that federal, state, and local funds should be allocated to health financing. Thus, the shared responsibility of financing the Unified Health System (Sistema Único de Saúde—SUS) established by the Constitution was strengthened. The federal government should spend in health services the same amount spent in the last year plus 5%. From then on, values should be adjusted according to the nominal variation of the gross domestic product (GDP). States and municipalities should devote a minimum amount to the health sector corresponding to a percentage of their own tax revenue and constitutional and legal transfers. This percentage gradually increased, and since 2004, it has been 12% for states and 15% for municipalities.

Nevertheless, there are recurrent complaints that health spending in Brazil is quite low and should increase. [Médici \(2011\)](#), however, notes that the amount of Brazilian public health expenditures is not so different from that seen in other countries with similar per capita income. Therefore, “saying that Brazil spends little on health would make more sense if it was possible to guarantee that the existing funds are being spent efficiently and that, in spite of this, the population's health needs are not being sufficiently or properly met” ([Médici, 2011, p. 46](#)).

The literature on the assessment of efficiency in the health sector can be split into two different strands.

The first derives from the World Health Report 2000. The original report, written by [Evans et al. \(2000\)](#) for the World Health Organization (WHO), proposes the use of a fixed-effect panel data model to create a production frontier in which individual country fixed-effects are used as inefficiency indicators. The following works use the same data but introduce extensions to the model used by WHO, sometimes employing alternative methods for efficiency estimation ([Navarro, 2000](#); [Williams, 2001](#); [Hollingsworth and Wildman, 2003](#); [Gravelle et al., 2003](#)).

The second strand basically seeks to calculate health efficiency scores using non-parametric and parametric techniques and to estimate their main determinants ([Gupta et al., 2002](#); [Afonso and St. Aubyn, 2005](#)).

The available evidence for Brazil follows the second strand of the literature. [Marinho \(2003\)](#) assesses the efficiency of municipalities in the state of Rio de Janeiro in providing outpatient and inpatient health services. [Brunet et al. \(2006\)](#) compare the use of funds by Brazilian states and by the Federal District to the supply of products and services (efficiency) and to the observed outcomes (effectiveness). [Mattos et al. \(2009\)](#) calculate efficiency scores for municipalities in the state of São Paulo in order to evaluate the impact of scale variables on the quality of public health services. [Souza et al. \(2010\)](#) also look at municipalities in the state of São Paulo, but they seek to assess the productive efficiency of the hospital sector between 1998 and 2003 and its determinants.

The aim of the current paper is to assess Brazilian local health expenditures in an attempt to determine whether it is necessary to increase the amount of public funds they allocate to the health sector or if the improvement of efficiency in the use of the existing funds is sufficient to meet the population's demand for public health services.<sup>1</sup> To achieve our purpose, we estimate the supply of public health services from the calculus of efficiency scores using the metafrontier methodology and the demand for public health services from an equation based on the median voter model. If the

<sup>1</sup> As noted by [Mirmirani et al. \(2008\)](#), “Health care costs are a financial burden for developing and transition economies, which have experienced a faster growing demand on their health care systems while aiming to improve efficiency”.

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