



Substitution at the margin: physicians vs nurses

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Objectivos (Objectives): The evolution of health professions has moved them up the ladder of knowledge and technical skills. Medical doctors, pharmacists and nurses have now clear “margins of substitution”. Using the concept of production, substitution between input factors is an important element in its characterization. Estimates of cost functions have been used to identify the degree of substitution between input factors. Our objective is to characterize the existing degree of substitution between nurses and physicians in the Portuguese health sector.

Metodologia (Methodology): The analysis is built around three blocks of evidence. The first block takes primary care units and estimates a cost frontier for them. The physician – nurse substitution margin is addressed by adding the ratio of nurses to physicians in each hospital. The second block is similar, methodologically, to the first one, using now hospital data instead of primary care units. Finally, the third block relates the ration of physicians to nurses to the relative wage directly, implicitly assuming a constant elasticity of substitution (CES) production function.

Resultados (Results): The evidence collected suggests that a relevant “margin of substitution” exists between physician work and nurse work in Portugal, being more relevant in primary care than in hospitals. Moreover, at the margin, increasing the number of nurses and reducing the number of physicians, for the same level of output, improves cost efficiency, according to current practice and data available. The crude estimation of implicit optimal ratio physician-to-nurses, under the assumption of a CES production function of labor input, produces an estimate of the elasticity of substitution.

Conclusões (Conclusions): Despite heavy regulation, management practice reveals the existence of "margins of substitution" that need to be considered in the discussions regarding efficiency in health care provision.