



Original Research

# Pharmaceutical services cost analysis using time-driven activity-based costing: A contribution to improve community pharmacies' management

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## Abstract

**Background:** The current financial crisis is pressing health systems to reduce costs while looking to improve service standards. In this context, the necessity to optimize health care systems management has become an imperative. However, little research has been conducted on health care and pharmaceutical services cost management.

**Aim:** Pharmaceutical services optimization requires a comprehensive understanding of resources usage and its costs. This study explores the development of a time-driven activity-based costing (TDABC) model, with the objective of calculating the cost of pharmaceutical services to help inform policy-making.

**Methods:** Pharmaceutical services supply patterns were studied in three pharmacies during a weekday through an observational study. Details of each activity's execution were recorded, including time spent per activity performed by pharmacists. Data on pharmacy costs was obtained through pharmacies' accounting records.

**Results:** The calculated cost of a dispensing service in these pharmacies ranged from €3.16 to €4.29. The cost of a counseling service when no medicine was supplied ranged from €1.24 to €1.46. The cost of health screening services ranged from €2.86 to €4.55.

**Conclusion:** The presented TDABC model gives us new insights on management and costs of community pharmacies. This study shows the importance of cost analysis for health care services, specifically on pharmaceutical services, in order to better inform pharmacies' management and the elaboration of pharmaceutical policies.

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**Keywords:** Pharmacy management; Time-driven activity-based costing; Pharmaceutical services; Community pharmacy

## Introduction

An aging population and an increasing prevalence of chronic diseases in OECD countries, with the associated rising costs of care, have long been

considered the main threat to the sustainability of global health systems. <sup>1</sup> The economic crisis affecting some OECD countries became another driver pressing health systems to ration expenditures while

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preserving quality and access to health care services.<sup>2</sup> These factors are inspiring political decisions to implement health system reforms, de-regulation and pro-competitive policies across health systems worldwide.<sup>3–5</sup>

To deal with these challenges, health system reforms have placed a greater emphasis on primary health care coverage, supported by multidisciplinary teams.<sup>6</sup> Most successful multidisciplinary chronic illness interventions include more significant roles for non-physicians, with studies showing that non-physician health professionals, such as community pharmacists, may be critical components of effective chronic disease care.<sup>7–9</sup> Community pharmacists are significantly contributing to primary health care by fulfilling an increasing range of roles and responsibilities.<sup>10,11</sup> These new roles stem from the origination of the concept of pharmaceutical care<sup>12</sup> over two decades ago. After this initial work, the profession developed numerous new services. These include services such as counseling about medicines and minor ailments, public education to promote public health, medication use review services, disease management services, immunization services, and several activities related to chronic diseases screening such as blood pressure, cholesterol, glycemia and lung capacity monitoring.<sup>13,14</sup>

Community pharmacies in Portugal have followed this general trend, with the provision of pharmaceutical care services supported and advocated by the country's main professional organizations.<sup>14</sup> However, a number of regulatory changes to the community pharmacy market were introduced in 2005, beginning with the extension of sales of over-the-counter (OTC) medicines to general shops beyond pharmacies, to the loss of pharmacists' exclusivity of propriety, and the possibility of a single proprietor to own a maximum number of 4 pharmacies.<sup>15</sup> These regulatory changes also expanded the provision of services to be offered by pharmacies, such as home care support, first aid, medicines administration, immunization (particularly for influenza flu shots), clinical analysis and therapeutic services. This new pro-competition market in which Portuguese community pharmacies presently operate, has brought a new necessity to gain a deeper understanding of costs for these new services, to gauge their potential impact on pharmacies' management.

One issue keeping policy makers from tapping into the potential of community pharmacists' interventions is the clear understanding of their

cost-effectiveness.<sup>16</sup> Although some studies point to the cost-effectiveness of pharmaceutical care programs and Pharmacy-based minor ailment schemes,<sup>8,17</sup> it is often mentioned that more research to determine the accurate costs of pharmaceutical services is needed,<sup>17,18</sup> to prevent inappropriate payment incentives, and to accomplish proper pharmacy services research.<sup>19</sup> Notwithstanding, there is a scarcity of costing studies for most types of pharmaceutical services. Some published studies on the profitability of pharmacy services tend to focus on single specific services over a limited period of time.<sup>20,21</sup> In a recent review of pharmacy-based minor ailment schemes' cost-effectiveness,<sup>17</sup> it was found that the majority of the published studies employed a classical top-down approach, sometimes apportioning consultation fees, medicine and administrative costs indiscriminately the cost computations, or had a less than straightforward method of cost calculation. In the case of Portugal, costing studies have focused predominantly on the financial sustainability of the pharmacy business. Recent local studies have drawn the attention on the decreasing average price of prescriptions as a measure of pharmacies' sustainability.<sup>22,23</sup> Therefore, this makes it difficult to draw wide-ranging conclusions on the impact of pharmaceutical services on pharmacy management and other health care resources, as well as on their cost-effectiveness.<sup>24</sup>

To better assess the management implications of pharmaceutical services provision in community pharmacies, there is a need to accurately measure costs through real-world evidence instead of assumptions and self-reported data. Considering that evidence is required to justify pharmacists' activities, the associated costs and assist community pharmacy management,<sup>25</sup> the aim of this work is to explore the development of a time-driven activity-based costing (TDABC) model for pharmaceutical services, with the objective of calculating services' costs, using a bottom-up approach. Accomplishing this objective will help to inform pharmacy managers, pharmacy professional organizations and policy makers about the costs of pharmaceutical services and their cost-effectiveness. Although this approach has been tried in outpatient clinics,<sup>26</sup> this is new to community pharmacy services' costing in Portugal or elsewhere. In the study by Demeere et al.,<sup>26</sup> the use of TDABC provided precise values of the costs of different consultations within five different departments, showing the influence of the specificity of the consultation or the usage of activities and

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