



## The Use of Innovative Technologies to Accurately Measure Costs to Reduce Waste in Healthcare

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### ABSTRACT

Digital health solutions that allow standardizing cost measurement processes provide the ability to scale cost accounting with minimal staffing. Such digital platforms enable the capability to manage costs in real-time, with real-world data, and use this information to deliver the most efficient and appropriate health care. One main contribution of adopting cutting-edge digital solutions with Time-driven Activity-Based Costing (TDABC) capabilities is the opportunity to benchmark care across other institutions and, consequently, drive actions to reduce waste. The next steps in measuring costs involve the quantification and dissemination of insights measured by the technology platform, and the consequent trust in shared data between all the stakeholders.

**Keywords:** Digital health; Healthcare system; Health care delivery

### DESCRIPTION

The continuous search for a more efficient healthcare system worldwide has promoted the adoption of innovative strategic models to manage resources and outcomes in the process to deliver health. Value-based health care (VBHC) is one of the innovative strategies introduced by Prof. Porter and Teisberg to rethink and redesign health care services [1]. Following VBHC principles, increasing value in health care involves structuring all the health care processes and systems to deliver better outcomes without increasing costs. This makes measuring outcomes and costs, often along an entire care cycle, a requirement for managing and measuring value [2]. Measuring human resource consumption during an entire cycle of care is a different process than measuring individual service delivery, which is the most common approach implemented by health care enterprise systems. This process has promoted a movement in studying and improving current methods of evaluating costs in health care [3]. Time-driven Activity-based Costing (TDABC) has been considered as the best strategy to deal with this challenge to measure resource consumption in an entire care cycle, by using the time spent per resource consumption as its main data

input [4]. During the last 10 years, systematic reviews recognize TDABC as a gold standard for measuring costs in a health care system to increase value [5,6]. The creation of an international committee of experts, the TDABC Health Care Consortium, has produced methodological guidelines to facilitate TDABC dissemination and usage [7,8].

Digital health solutions that allow standardizing cost measurement processes provide the ability to scale cost accounting with minimal staffing. Such digital platforms enable the capability to manage costs in real-time, with real-world data, and use this information to deliver more efficient and appropriate health care. In the United States, TDABC studies with considerable patient samples are being done with the support of digital solutions that automate the cost estimation process based on time resource consumption, with examples in total shoulder arthroplasty [9,10] and hip and knee revisions [11,12]. In those examples, using software based on TDABC principles makes it possible to identify cost-saving opportunities and resource consumption variability, and guide health care delivery based on data from thousands of patients without the need to collect them manually.

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A benefit of adopting cutting-edge digital solutions with TDABC principles is the opportunity to benchmark across other comparable institutions to identify services that are delivering better outcomes with lower resource consumption. These digital platforms contribute to reducing the variability of care processes, estimating potential cost-savings, and measuring and increasing value in health care [6,13]. An international initiative is being developed to identify patient-level cost sets for clinical conditions [14]. If positive results are shown, it can improve the standardization in measuring resource consumption between organizations and, consequently, serve as an important element to generate accurate information to design health policies centered on value.

Among several health care systems, value-based agreements are being designed and implemented as strategies to reimburse health services, making access to accurate cost and outcomes information a requirement [12]. If organizations do not develop a data-driven culture and increase their technology capabilities to timely measure outcomes and costs, the implementation of value-based payment strategies will be subject to high-risk obstacles and challenges. Leveraging TDABC-based digital solutions to measure costs, benchmarking resource consumption, and disseminating cost-reduction and operation improvement opportunities will help health care systems reach the end goal of increasing value in health care.

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## CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest.

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