

A micro-cost analysis of the use of personal protective equipment during and before the COVID-19 pandemic from a hospital perspective

EIXO 1: SUSTENTABILIDADE NOS SISTEMAS DE SAÚDE

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Introduction: During the COVID-19 pandemic, the demand for personal protective equipment (PPE) increased significantly across all healthcare sectors, and problems with the PPE supply chain were evident. As a result, many institutions had to adapt to the new reality, many companies donated, and the country learned to manufacture its own PPE. Objective: To calculate the direct cost of PPE used during the COVID-19 pandemic from the perspective of a Brazilian tertiary public hospital.

Methods: We conducted a cost analysis on patients admitted to the Hospital das Clínicas of Medical School, São Paulo State University (HCFMB, a Brazilian public tertiary hospital) 12 months before the COVID-19 pandemic (2019) and 12 months during the COVID-19 pandemic (2021). We evaluated the cost of PPE during the pandemic to the cost before using the micro-costing method. Cost estimates were converted into U.S. dollars in 2023, taking inflation into account and using purchasing power parity conversion rates. Our expenses included gloves, disposable gowns, head coverings, masks, N95 respirators, and eye protection. The number of PPE used was determined by the hospital's usual protocol, the total number of hospitalized patients, and the number of days of hospitalization. We used the following variables for uncertainty analysis: PPE adherence, an interquartile range of median length of hospitalization, and variance in the cost of each PPE.

Results: In 2021, 26,618 individuals were hospitalized compared with 29,416 in 2019. The median length of stay was 6 and 4 days, respectively. The total and per-patient direct cost of PPE were projected to be 2,939,935.47 USD and 110.45 USD, respectively, during the pandemic, and 1,570,124.08 USD and 53.38 USD, respectively, before the pandemic. The cost per PPE at the start of the pandemic (2020) affected the total cost estimate the most, followed by the median number of days hospitalized.

Discussion and conclusions: From the perspective of a Brazilian tertiary public hospital, direct total cost estimated with PPE in 2021 (during the COVID-19 pandemic) was nearly twice higher than in 2019 (before the COVID-19 pandemic). Additionally, the estimated cost per patient before the pandemic was 53.38 USD and 110.45 USD during the pandemic. This difference might be explained by the fact that PPE was used three times higher in the care of patients with COVID-19 than in patients without isolation precautions.

Keywords: Cost; Cost Analysis; COVID-19; Pandemics; Personal Protective Equipment