

TITLE: How have COVID-19 and the Policy Objective of Access to Care Altered the Cost-Volume-Profit Relationships of U.S. Hospitals?

Introduction

The theoretical cost-volume-profit (CVP) relationship for any organization assumes market-driven demand and supply functions. When the public policy objectives of cost, quality and access to care influence hospital payment system designs, and the demand for services and case mix is highly skewed by events such as the COVID-19 pandemic with its associated governmental policy responses, the CVP relationships are significantly altered.

Methods

We present theoretical and empirical analyses of hospital CVP relationships using the most recent 10-years of primary source data for approximately 3,500 short-term, acute care hospitals throughout the U.S.--including several forms of governmental, private non-profit, and for-profit hospitals. We compare hospital CVP attributes based on type of control, chain affiliation, teaching status, geographic location, critical access status, patient case mix, payer mix, relative inpatient/outpatient mix, size, profitability, and degree of financial leverage. We develop a hospital volume metric based on patient discharges adjusted by Case Mix Index and the relative proportion of inpatient / outpatient services provided.

Results

We find that hospitals cluster into two broad categories—those with, (a) total cost and total revenue lines that are essentially linear and parallel with a positive contribution margin and no proximate break-even point within the case mix adjusted volume range, and (b) total cost and total revenue lines that fluctuate and cross multiple times within the case mix adjusted volume range. We also find certain hospitals have negative contribution margins, and negative slopes for their total revenue and total cost lines due to the COVID-19 effect of crowding-out elective and non-emergency services.

Conclusions

Our findings demonstrate the counter-intuitive behaviour of hospital economic relationships under COVID-19 and public policy interventions that significantly alter the CVP structure of U.S. hospitals. Our findings provide information useful for the development and tests of economic theory, for evidence-based public health policy making with regard to services and payment systems, and for the advancement of hospital management practice.