

Predictive modeling to estimate the demand for intensive care hospital beds nationwide in the context of the COVID-19 pandemic

Por: [Pena, VH](#) (Hugo Pena, Victor)^{1,1}; [Espinosa, A](#) (Espinosa, Alejandra)^{1,1}

MEDWAVE

Volumen: 20

Número: 9

Número de artículo: e8039

DOI: 10.5867/medwave.2020.09.8039

Fecha de publicación: OCT 2020

Tipo de documento: Review

Abstract

Introduction

SARS CoV-2 pandemic is pressing hard on the responsiveness of health systems worldwide, notably concerning the massive surge in demand for intensive care hospital beds.

Aim

This study proposes a methodology to estimate the saturation moment of hospital intensive care beds (critical care beds) and determine the number of units required to compensate for this saturation.

Methods

A total of 22,016 patients with diagnostic confirmation for COVID-19 caused by SARS-CoV-2 were analyzed between March 4 and May 5, 2020, nationwide. Based on information from the Chilean Ministry of Health and ministerial announcements in the media, the overall availability of critical care beds was estimated at 1,900 to 2,000. The Gompertz function was used to estimate the expected number of COVID-19 patients and to assess their exposure to the available supply of intensive care beds in various possible scenarios, taking into account the supply of total critical care beds, the average occupational index, and the demand for COVID-19 patients who would require an intensive care bed.

Results

A 100% occupancy of critical care beds could be reached between May 11 and May 27. This condition could be extended for around 48 days, depending on how the expected over-demand is managed.

Conclusion

A simple, easily interpretable, and applicable to all levels (nationwide, regionwide, municipalities, and hospitals) model is offered as a contribution to managing the expected demand for the coming weeks and helping reduce the adverse effects of the COVID-19 pandemic.

Palabras clave

Palabras clave de autor:[2019 novel coronavirus disease](#); [epidemiology](#); [public health](#); [viruses](#); [emergency medicine](#); [hospitalization](#)

Información del autor

Dirección para petición de copias:

Universidad de Chile Univ Chile, Fac Med, Dept Tecnol Med, Santiago, Chile.

Dirección correspondiente: Pena, VH (autor correspondiente)

+ Univ Chile, Fac Med, Dept Tecnol Med, Santiago, Chile.

Direcciones:

+ [1] Univ Chile, Fac Med, Dept Tecnol Med, Santiago, Chile

Direcciones de correo electrónico:vicarcl@gmail.com

Editorial

MEDWAVE ESTUDIOS LTD, VILLASECA 21 OFIC 702, SANTIAGO DE CHILE, 00000, CHILE

Categorías / Clasificación

Áreas de investigación:General & Internal Medicine

Categorías de Web of Science:Medicine, General & Internal

Información del documento

Idioma:Spanish

Número de acceso: WOS:000603375100001

ID de PubMed: 33031358

ISSN: 0717-6384