

Health systems impacts of SARS-CoV-2 variants of concern: Findings from a rapid scoping review

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Summary

All but one study identified on this topic focused on capacity planning (e.g., hospitalizations, ICU admissions, deaths). Most studies found an increase in hospitalizations and deaths as a result of VOC, but evidence on ICU admissions was mixed.

Almost all studies reported on the Alpha variant with limited studies on Beta and Gamma and none on Delta. It is thus unclear whether all VOC hold the same risk of increased mortality. Additionally, all studies on health system arrangements come from three areas – United Kingdom, Europe, and Brazil. Thus, the impact of VOCs on other health systems around the world are predominantly unreported in the literature to date.

No studies reported on screening staff and visits, adjusting service provisions, or adjusting patient accommodations and shared spaces, which is a significant gap in the literature.

Implications

This review has identified the need for:

- Evidence to support adjusting patient accommodations and shared spaces in a hospital setting with the emergence of different strains;
- Evidence on the Beta, Gamma, and Delta variants to determine whether the risks to health system arrangements are similar for all VOC; and
- Standards for sharing surveillance data nationally to rapidly inform health policy and health system guidance documents.

For more information, please contact
 Dr. Janet Curran (jacurran@dal.ca)

What is the current situation?

Four SARS-CoV-2 variants of concern (VOC) have been identified by the World Health Organization: Alpha (B.1.1.7), Beta (B.1.351), Gamma (P.1), and Delta (B.1.617). VOC can potentially cause changes in transmissibility, clinical presentation, and severity, and they may have an impact on countermeasures.

What is the objective?

This rapid scoping review aimed to provide a synthesis of current evidence related to public health measures and health systems arrangements associated with VOC. This document provides an overview of findings related to **health systems arrangements**, specifically:

- Adjusting capacity planning to accommodate changes in the risk of re-infection and the risk of severe disease
- Adjusting personal protective equipment (PPE) procedures for health workers
- Adjusting restrictions to and screening staff and visitors
- Adjusting service provision
- Adjusting patient accommodations, shared spaces, and common spaces

How was the review conducted?

An information specialist designed a broad, comprehensive search to retrieve all published and preprint literature related to the VOC in MEDLINE, Embase, the Cochrane Library, Epistemonikos' L·OVE on COVID-19, medRxiv, and bioRxiv up to May 11, 2021. Titles/abstracts and full text were screened independently by two reviewers. Data were double extracted using a standardized form. Studies were included if they reported on at least one of the VOC and public health or health system outcomes. Critical appraisal was conducted using the Newcastle-Ottawa Scale for case-control, cohort, and cross-sectional studies.

What did the review find?

- 25 included studies reported on health systems arrangements, and all but one focused on capacity planning (e.g., hospitalizations, ICU admissions, deaths). Included studies used a wide range of designs and methods, and most reported on the Alpha variant.
- Of the 19 studies that qualified for critical appraisal, two were low quality, 10 were medium quality, and seven were high quality.
- Most studies found an increase in hospitalization due to VOC, but mixed findings were found on ICU admission. There are limited studies to date on ICU admissions for Beta and Gamma, but the two studies that reported on these VOC did not find any difference on ICU admission. The majority of studies reporting mortality data found an increased risk of death due to VOC.
- One study reported on the effectiveness of personal protective equipment in reducing VOC transmission in the hospital.