(Re)conceptualizing vulnerability in health under the syndemics perspective: protocol for a scoping review [version 1; peer review: awaiting peer review]

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Abstract
The concept of vulnerability has been widely used in global health research to assess susceptibility to diseases and disasters in individuals and groups. This perspective has proven to be useful for policy making by bringing attention to the unequal distribution of risks and impacts in specific populations and contexts. However, it is often insufficient to explain interactions between environmental, zoonotic, and social realms involved in the experience of health and disease. Theoretical developments proposed under the syndemics approach have intended to explore this gap by studying the underlying political, economic, and social dynamics affecting the occurrence of overlapping health issues. During the coronavirus disease 2019 (COVID-19) pandemic, the term syndemics has been used to refer to underlying conditions and social factors impacting disease outcomes. This scoping review aims to explore the contributions of the syndemics perspective to the (re)conceptualization of vulnerability during the COVID-19 pandemic. We intend to do so by identifying social and environmental arrangements so far described in original research, opinion pieces or reviews published since December 2019. Variations in the explanations provided about the role played by socio-environmental dynamics in the observed interactions in populations, settings, and interacting conditions will be subsequently examined. Finally, we will track the contributions and limitations of the syndemics perspective to the study of vulnerability in health in light of the evidence produced around COVID-19.

Keywords
Vulnerability; syndemics; COVID-19; syndemic vulnerability; interactions
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Introduction

In the last decades, the concept of vulnerability has been widely used in global health research to assess susceptibility to diseases and disasters in individuals and groups. Along with its increasing use, its polysemous character and scope have become more evident. Patterns and variations of this concept within the health field are articulated around historical contexts, conjunctural circumstances, lifetime trajectories, individual risk factors, and conditions of exposure to specific pathogenic agents (Wardrop et al., 2021). Although vulnerability is now recognized as a dynamic trait compounded by biomedical, social, and environmental dynamics, sanitary perspectives—particularly focused on individual vulnerability to disease-specific risk factors—have substantially informed research on this area (Hufschmidt, 2011; Osborne et al., 2021). While adding a vulnerability angle has proven to be useful to bring attention to the unequal distribution of the risks to and consequences of diseases and disasters (Faas, 2016), this perspective is often insufficient to explain interactions between environmental, zoonotic, and social dynamics in the generation of health and disease (Jeleff et al., 2022).

Moreover, labeling specific groups and vast geographical areas under the category of ‘vulnerable’ seems to have been more blurring than illuminating in terms of the actual capacity of this concept to explain the realities of those covered by it, acknowledge their responses generated under unfavorable conditions, and counter the dynamics of marginalization and exclusion originating such vulnerability in the first place (Marino & Faas, 2020).

Theoretical arguments developed around the concepts of structural vulnerability (Holmes, 2011), structural violence (Farmer, 1996), and syndemics (Singer, 2009), have explored these underlying factors and interactions. The concept of ‘syndemics’, in particular, seems to have special traction. This perspective intends to explore how synergistic interactions between two or more diseases under specific social conditions can negatively affect the mutual course of each disease trajectory, and, consequently, enhance vulnerability and health inequities (Brazil, 2022; Sharma, 2017; Singer et al., 2017). Core to this concept is the identification of a bio-social interface, understood as the intersection in which social and environmental arrangements structurally linked to the overlap of diseases can cause or exacerbate their occurrence (Singer et al., 2020).

Since its first inception, the concept of vulnerability was constitutive of this approach, as social factors have been usually presented as generators or instigators of heightened vulnerability in particular social groups and contexts (Mendenhall et al., 2017; Singer, 2009; Singer et al., 2020; Sharma, 2017). The idea of ‘syndemic vulnerability’, specifically, links both concepts by alluding to the integration of “epidemiological and experiential levels of analysis of multiple, overlapping social and health problems that increase morbidity and mortality as a result of syndemic clustering of social and health conditions within a certain context” (Singer et al., 2017). This specific variation has been used to bring forward issues of power-sustaining inequities involved in the clustering of diseases and risk factors (Singer & Rylko-Bauer, 2021).

What seems to be the most important contribution of the syndemics perspective to public health practice, i.e., applying a systemic perspective to understand health and disease (Hossain et al., 2022; Mendenhall et al., 2022; Newfield, 2022), has come into question in the last years. Recent critiques to syndemics’ research have alerted of the danger of generating diffuse predictions based on the assumption of mutually reinforcing factors for which interactions cannot be clearly described (Tsai, 2018), as well as the persistent practice of applying biomedical lenses to describe specific contexts in terms of risks (Weaver & Kaiser, 2022), while ignoring other layers of complexity also emerging from said contexts (Slagboom et al., 2022). Similarly, researchers have claimed that there is still much to learn about the specific ways in which environmental, economic, cultural, and social factors interact to create high-risk contexts for overlapping health conditions (Mendenhall et al., 2017; Willen et al., 2017). In 2020, a scoping review found that most articles on syndemic interactions published between 2015 and 2019 described the influence of social determinants such as poverty, inequity, and racism on the clustering of diseases or disease outcomes (Singer et al., 2020). The same review, however, recognized that the articulation of those factors in relation to disease trajectories just starts to be understood (Nichter, 2016; Singer et al., 2020).

This scoping review acknowledges the potential to continue improving the scientific literature on syndemics, particularly about the systemic nature of vulnerability in health. One of the reasons to consider the current relevance of this approach is the extensive use of the syndemics perspective in the study of the overlapping biomedical and socio-economic conditions exacerbating the impacts of the coronavirus disease 2019 (COVID-19) pandemic around the world (McMahon, 2021). The interactions of the infection with pre-existing chronic diseases, their articulation with environmental factors (Yadav et al., 2020), and the early impacts of COVID-19 in marginalized or socially excluded groups (Gravlee, 2020; Lund, 2020; Selden & Berdahl, 2020) have brought a new impetus to syndemics’ research (Poteat et al., 2020; Singer & Rylko-Bauer, 2021), which we are interested in further exploring.

With this review, we intend to systematically explore the contributions of the syndemics perspective to conceptualizations of vulnerability articulated during the COVID-19 pandemic. We intend to do so by identifying social and
environmental arrangements so far described in syndemic research published since December 2019 and their associations with the idea of vulnerability. In first place, interactions among diseases and health conditions, species, social factors; and environmental dynamics so far described in the literature will be examined. Subsequently, we will focus on bio-social interactions and will capture variations in the explanations provided about the role played by those socio-environmental dynamics in the observed interactions in relation to populations, settings, and interacting conditions. Finally, we will track the contributions and limitations of the syndemics perspective to the study of vulnerability in health in light of the evidence produced around COVID-19.

**Review questions**

Three questions will guide this review:

a. Which social and environmental arrangements (determinants, factors, dynamics, and aspects) have been described in syndemics’ research around COVID-19?

b. How have those social arrangements been conceptualized and studied (methodological approaches)?

c. What are the main contributions and limitations of the syndemics perspective to the study of vulnerability in health in the context of the current pandemic?

**Methods**

**Eligibility criteria**

In the first phase of data extraction, records will be included if they meet all the following criteria:

- Original research, opinion pieces, or reviews
- Include the words syndemics, vulnerability, and COVID-19 in the title, abstract, or keywords
- Elaborate on issues of vulnerability in the body of the text
- Published since December 2019

No restrictions of language, studied conditions, or geographical location will be applied.

At the stage of full-text screening, publications will be excluded if they are focused only on the bio-bio interface of the interaction, do not sufficiently explain the social aspects of the syndemic, or if they do not sufficiently elaborate on the concepts of syndemics and/or vulnerability.

**Information sources**

The primary source of records will be PubMed with no restriction of language. We expect to screen the reference lists of the records included (especially review papers) and contact some experts in the field to ask for other potentially relevant records that we do not identify through the search strategy.

**Search strategy**

The search strategy is based on the combination of three categories: COVID-19, syndemics, and vulnerability. The Boolean operators “AND” and “OR” will be used to combine search terms. Table 1 summarizes the proposed search syntax for PubMed. In the secondary sources of research records, the same strategy will be used.

**Data extraction**

All retrieved records from the primary and secondary sources of the search will be imported to COVIDENCE. Duplicate records will be identified and excluded using COVIDENCE and Mendeley. Title, abstract, and keyword screening will be

<table>
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<th>Table 1. Planned search syntax for PubMed.</th>
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<td>Results: 50</td>
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conducted by two members of the research team, who will select those articles that will be included in the full-text review. Discrepancies will be discussed and solved by the review team. The review of articles’ reference lists will be conducted at this stage. Two reviewers will extract data into the COVIDENCE database according to the categories previously defined (Table 2). A preliminary data extraction form will be tested with at least 10 of the selected records. The results of the pilot test will be used to refine the first draft of the data extraction form. Data extraction and analysis will be based only on the content of the published records. Thematic analysis based on the categories included in the data extraction form will be conducted for each research question. Given its intersection with the syndemics perspective, we will use the dimensions proposed by Ribera and Hausmann-Muela (2011)—structural, agent driven, and conjunctural—for the analysis of the vulnerability.

**Data synthesis strategy**
Results will be presented as narrative synthesis, following the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist as a guideline. In addition, tables and figures will be created to show the findings related to the categories included in the final data extraction form.

**Reporting**
The protocol has been prepared according to the Prisma Extension for Scoping Reviews (PRISMA-ScR).

**Planning**
Table 3 summarizes the time frame planned to conduct the review.

**Study status**
Formal review will not start before the publication of the protocol; however, some preliminary searches were conducted to explore the scope of available records about the research topic.

**Table 3. Expected time frame of the scoping review.**

<table>
<thead>
<tr>
<th>Activities</th>
<th>Timeframe</th>
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<tbody>
<tr>
<td>Protocol submission</td>
<td>September, 2022</td>
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<tr>
<td>Search, selection, data extraction, and analysis</td>
<td>September-October, 2022</td>
</tr>
<tr>
<td>Data analysis</td>
<td>November, 2022</td>
</tr>
<tr>
<td>Writing scientific article</td>
<td>November-December, 2022</td>
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Dissemination
Findings will be disseminated through scientific publications in peer review journals and academic spaces in which the authors participate, including conferences, courses, and seminars.

Data availability
No data are associated with this article.

References


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