A Systematic Review Of Sexual Violence And Hiv In The Post-Disaster Context: Latin America And The Caribbean

Jane O'ryan
Yale University, jane.obryan@yale.edu

Follow this and additional works at: http://elischolar.library.yale.edu/ysphtdl

Recommended Citation
http://elischolar.library.yale.edu/ysphtdl/1214

This Open Access Thesis is brought to you for free and open access by the School of Public Health at EliScholar – A Digital Platform for Scholarly Publishing at Yale. It has been accepted for inclusion in Public Health Theses by an authorized administrator of EliScholar – A Digital Platform for Scholarly Publishing at Yale. For more information, please contact elischolar@yale.edu.
A SYSTEMATIC REVIEW OF SEXUAL VIOLENCE AND HIV IN THE POST-DISASTER CONTEXT: LATIN AMERICA AND THE CARIBBEAN

Submitted by Jane O’Bryan
Department of Epidemiology of Microbial Diseases

In partial fulfillment of the requirements
For the degree of Master of Public Health

Yale School of Public Health

Spring 2016

Thesis Advisor: Kaveh Khoshnood, Ph.D.

Second Reader: Bandy Lee, M.D.
A SYSTEMATIC REVIEW OF SEXUAL VIOLENCE AND HIV IN THE POST-DISASTER CONTEXT: LATIN AMERICA AND THE CARIBBEAN

Jane O’Bryan, Department of Epidemiology of Microbial Diseases, Yale School of Public Health

ABSTRACT

INTRODUCTION: In the last decade, over 800 disasters struck Latin America and the Caribbean, cumulatively affecting an estimated 64 million people. Three quarters of the region’s population lives in disaster risk areas. There is widespread consensus that sexual violence increases in the aftermath of disasters, however historically its prevention has not been prioritized, and in general it remains a vastly understudied phenomenon at the intersection of health and human rights. The linkage between sexual violence and Human Immunodeficiency Virus (HIV) in the post-disaster context is similarly unrepresented in the literature.

OBJECTIVES: This systematic review aims to assess the extent to which sexual violence in the post-disaster context has been studied in the region of Latin America and the Caribbean. The primary objectives of the review include (1) to identify and assess the quality of existing literature on sexual violence in the post-disaster context in Latin America and the Caribbean; (2) to assess whether ostensible increases in incidence of sexual violence and HIV infection in the post-disaster context are supported by the existing literature; and (3) to describe contextual factors of the post-disaster context that exacerbate sexual violence vulnerabilities.

METHODS: A systematic review of the literature was conducted by searching PubMed, Ovid Global Health, Web of Science and LILACS databases for relevant publications on sexual violence in post-disaster Latin America and the Caribbean (n=147). Exclusion criteria were applied and 10 articles investigating the 2010 earthquake in Haiti (n=7), the 2007 earthquake in Peru (n=1), Hurricane Noel (2007) in the Dominican Republic (n=1), and Hurricane Mitch (1998) in Honduras and Nicaragua (n=1) were ultimately reviewed.

RESULTS: The results of this systematic review indicate that sexual violence increases in the aftermath of natural disasters and that women and girls are the most vulnerable populations. Sexual violence may also increase risk of HIV, however there is insufficient evidence to support an association between sexual violence and HIV at the population level. Structural and social factors, most notably gender inequality, exacerbate sexual violence vulnerabilities in the post-disaster context.

CONCLUSIONS: There is an urgent need for additional research investigating sexual violence in the global post-disaster context in order to inform prevention efforts and disaster preparedness and to uphold human rights.

Funding: This project received no funding.
Competing Interests: No competing interests exist.

Acknowledgements

I would like to thank Kate Nyhan, Research and Education Librarian at the Harvey Cushing/John Hay Whitney Medical Library at Yale, for her continuous support and expert advice during the literature search process. I would also like to thank my thesis advisor, Dr. Kaveh Khoshnood, for his support and encouragement.
INTRODUCTION

Natural Disasters in Latin America and the Caribbean

There were nearly 7,000 natural disasters worldwide recorded by the Emergency Events Database of the Center for Research on the Epidemiology of Disasters (CRED) from 1994 to 2013. These disasters claimed an estimated 1.35 million lives and affected 218 million people on average per year. The frequency and magnitude of impact of natural disasters and resulting humanitarian crises have increased substantially in recent years. Leaning and Guha-Sapir (2015) attribute 80% of the increase to climate-related events and warn that the frequency and severity of floods and storms in particular will rise with continued climate change.

The region of Latin America and the Caribbean is particularly vulnerable to geophysical disasters including volcanic eruptions and earthquakes, and also droughts and floods related to the El Niño phenomenon and cyclic tropical storming “widely believed to have intensified with global warming.” The United Nations Population Fund estimates that 75% of the population in Latin America and the Caribbean lives in disaster risk areas. In the last decade, the region has suffered more than 800 disasters that cumulatively affected an estimated 64 million people. Most recently, Muisne, Ecuador, was struck by a magnitude 7.8 earthquake on April 18, 2016. The death toll has risen to more than 650 fatalities, and it is estimated that over 26,000 people have been displaced and are now living in shelters across the country.

Natural Disasters and Sexual Violence

Natural disasters create social vulnerabilities, and can “render individuals and groups vulnerable to human rights violations or may exacerbate [existing] vulnerabilities.” There is widespread consensus that sexual violence, in its multitude of manifestations, increases in the aftermath of disaster and the humanitarian crises that ensue. The prevention of sexual violence and the promotion of reproductive health have historically not been prioritized in humanitarian settings, and sexual violence in general remains a vastly understudied phenomenon at the intersection of health and human rights. Figure 1 depicts seven of the most impactful natural disasters to strike Latin America and the Caribbean in recent years, in terms of the number of people affected, total deaths, and economic loss. Statistics from the United Nations Population Fund paint a horrifying picture – almost 65,000 women are estimated to have been raped in the contexts shown on the map.

Figure 1 Recent Natural Disasters in Latin America and the Caribbean. Image reproduced from the United Nations Population Fund Report, Gender-Based Violence and Natural Disasters in Latin America and the Caribbean.
Definition of Sexual Violence

According to the World Health Organization (WHO), sexual violence “encompasses acts that range from verbal harassment to forced penetration, and an array of types of coercion, from social pressure and intimidation to physical force.”

The WHO defines sexual violence as:

“Any sexual act, attempt to obtain a sexual act, unwanted sexual comments or advances, or acts to traffic or otherwise directed against a person’s sexuality using coercion, by any person regardless of their relationship to the victim, in any setting, including but not limited to home and work.”

For the purposes of this review, sexual violence was defined according to the parameters outlined in the WHO’s definition. Figure 2 describes what the WHO considers to be the predominant forms of sexual violence and the contexts in which violence can occur. These forms and contexts informed the framework of the search strategy and the development of inclusion criteria for the review.

Sexual Violence and HIV

The linkage between sexual violence and Human Immunodeficiency Virus (HIV) in the post-disaster context is similarly unrepresented in the literature. However, in the words of Austin et al. (2008), “traditional wisdom has suggested that the conditions of deprivation experienced by displaced populations…together with sexual violence, provide fertile ground for the spread of infectious diseases, including HIV/AIDS.” A substantial amount of research has investigated the deleterious effects of disasters and displacement on HIV risk, HIV prevalence, and challenges of treatment and prevention, however HIV risk in the post-disaster context with sexual violence as a mediating factor has not been broadly considered or well documented.

There is some contention among researchers who have studied conflict and post-conflict settings about whether there is a true association between sexual violence and heightened HIV incidence. Anema et al. (2008) modeled scenarios of widespread rape and evaluated the potential impact on HIV prevalence in seven African countries, and found that even in “the most extreme situations, where 15% of the female population was raped, where HIV prevalence among assailants was 8 times the average high rate [prevalence in the general population], widespread rape increased the absolute HIV prevalence of these countries by only 0.023%.” Paul Spiegel, former United Nations High Commissioner for Refugees, underscored these results...
in a 2004 paper, stating, “The common assumption that this vulnerability necessarily translates into more HIV infections and consequently fuels the HIV/AIDS epidemic is not supported by data.” Watts et al. (2010) issued a similar statement, “Despite reports of rape-related incidents of HIV infection, ecological analyses have found no association between SV [sexual violence] and HIV at a population level.” At the individual level, however, the modeling analysis conducted by Watts et al. (2010) suggested that sexual violence could “increase HIV incidence by 10% if rape is widespread,” and that “genital injury increases HIV transmission (threelfold or more).”

The research seems to suggest that in conflict and post-conflict settings, at the population level, sexual violence is not significantly associated with increased HIV incidence, but at the individual level, sexual violence is a strong risk factor for HIV acquisition. Anema et al. (2008) stressed the importance of proper care and treatment for survivors of sexual violence, “regardless of the epidemiological effects of HIV transmission at the population level.” Indeed, HIV infection on an individual basis is a reality of sexual violence, exacerbated by barriers to healthcare access, lack of availability of HIV prophylaxis medications, and stigma, and HIV is only one of the devastating outcomes that can result from sexual violence.

**OBJECTIVES**

Few studies have examined sexual violence in the aftermath of natural disasters. The systematic review data screening process for this paper revealed that the majority of published literature on sexual violence in the post-disaster context has thus far focused on post-conflict displacement and humanitarian crises resulting from war, genocide, and persecution on the African continent. Fewer studies still have gone beyond documenting increased incidence of sexual violence in the post-disaster context to look at broader implications for public health and humanitarian relief efforts, including combatting the spread of sexually transmitted infectious diseases. This systematic review aims to assess the extent to which sexual violence in the post-disaster context has been studied in the region of Latin America and the Caribbean. The primary objectives of the review are as follows: (1) to identify and assess the quality of existing literature on sexual violence in the post-disaster context in Latin America and the Caribbean; (2) to assess whether ostensible increases in incidence of sexual violence and HIV infection in the post-disaster context are supported by the existing literature; and (3) to describe contextual factors of the post-disaster context that exacerbate sexual violence vulnerabilities.
METHODS

Search Strategy

This systematic review adheres to the Preferred Reporting Items for Systematic Reviews (PRISMA) statement. Four core themes structured the inclusion criteria: sexual violence, natural disasters, displacement, and HIV. The articles selected for final review had to address all four of the thematic areas outlined in Table 1 to be accepted. The specific search terms were generated by the author through a preliminary review of the literature on sexual violence in the post-disaster context, and through a review of medical subject heading terms (MeSH), controlled vocabularies and key words from relevant articles discovered during preliminary searches in PubMed and Ovid Global Health. Appendix 1 details the search strategies employed for each of the databases.

TABLE 1 Search Terminology Used in Systematic Review by Core Theme

<table>
<thead>
<tr>
<th>Sexual Violence</th>
<th>Natural Disasters</th>
<th>Displacement</th>
<th>HIV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex Offenses</td>
<td>Disaster</td>
<td>Emergency</td>
<td>HIV/AIDS</td>
</tr>
<tr>
<td>Sexual Abuse</td>
<td>Earthquake</td>
<td>Refugee Camp</td>
<td>HIV prevalence</td>
</tr>
<tr>
<td>Sexual Child Abuse</td>
<td>Tropical Storm</td>
<td>Refugee</td>
<td>HIV incidence</td>
</tr>
<tr>
<td>Human Trafficking</td>
<td>Flood</td>
<td>Evacuation</td>
<td>HIV epidemiology</td>
</tr>
<tr>
<td>Intimate Partner Violence</td>
<td>Avalanche</td>
<td>Humanitarian Setting</td>
<td>Human Immunodeficiency Virus</td>
</tr>
<tr>
<td>Rape</td>
<td>Tsunami</td>
<td>Humanitarian Crisis</td>
<td>HIV infection</td>
</tr>
<tr>
<td>Forced Sex</td>
<td>Hurricane</td>
<td>Internal Displacement</td>
<td>Sexually transmitted disease/infection</td>
</tr>
<tr>
<td>Domestic Abuse</td>
<td>Landslide</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sexual Assault</td>
<td>Volcanic Eruption</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender-based Violence</td>
<td>Geological Processes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Data Sources and Inclusion Criteria

The electronic databases Ovid Global Health, PubMed, Web of Science and LILACS (Latin American and Caribbean Center on Health Sciences Information) were searched from February to April 2016, according to the search terminology outlined in Table 1 and Appendix 1, for all relevant published material. All returned citations were downloaded into an EndNote library (v.X7) for the data screening process. Articles were initially selected on the basis of the search terms related to sexual violence, natural disasters, displacement, and HIV. The titles and abstracts were reviewed to determine whether the article content was substantive in terms of the primary outcome of interest, sexual violence in the post-disaster context. Inclusion and exclusion criteria, presented in Table 2, were applied during the title and abstract review process. Articles that investigated populations displaced for reasons other than natural disasters were excluded, as were articles that studied populations or geographic regions outside of Latin America and the Caribbean. Conference proceedings, committee reports, book chapters, commentaries and perspectives were also excluded. No study types or designs were formally excluded. Articles
published in languages other than English or Spanish were also excluded from the review. Full text reviews were conducted and the inclusion and exclusion criteria were re-applied to select the final articles for inclusion.

**TABLE 2 Inclusion and Exclusion Criteria**

<table>
<thead>
<tr>
<th>Category</th>
<th>Included</th>
<th>Excluded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting of interest</td>
<td>Latin America and the Caribbean (Region as defined by the World Bank)³⁶</td>
<td>Studies that exclusively investigated countries or regions outside of Latin America and the Caribbean</td>
</tr>
<tr>
<td>Population of interest</td>
<td>Natural disaster-affected, displaced populations</td>
<td>Studies on war and conflict-affected displaced populations, studies on non-displaced populations</td>
</tr>
<tr>
<td>Outcome of interest</td>
<td>Sexual violence (i.e. rape, sexual assault, sexual abuse, intimate partner violence, sex trafficking, and other forms)</td>
<td>Studies on other types of violence or focused primarily on other outcomes of natural disasters</td>
</tr>
<tr>
<td>Publication Types</td>
<td>Articles published in peer-reviewed journals, reports published by governmental and non-governmental organizations, working papers</td>
<td>Conference proceedings, committee reports, book chapters, commentaries and perspectives</td>
</tr>
<tr>
<td>Research Designs</td>
<td>Qualitative, quantitative and mixed-methods research, reviews</td>
<td>No study types or designs were formally excluded from the search</td>
</tr>
<tr>
<td>Language</td>
<td>English and Spanish</td>
<td>Other Languages</td>
</tr>
</tbody>
</table>

**Quality Assessment**

Given the variety of methods employed in the included publications, the Mixed Methods Appraisal Tool, “designed for the appraisal stage of complex systematic literature reviews that include qualitative, quantitative and mixed methods studies,”³⁷ was utilized to assess methodological quality. For each study, a score indicating the number of criteria met (0-4) is given for qualitative components (QUAL), quantitative components (QUAN), or mixed methods components (MM), where applicable. Inter-rater reliability could not be assessed given the sole authorship of this review, and this is a limitation of the review. Appendix 2 contains a table detailing the MMAT criteria and template utilized for quality assessment. Only one study by Kolbe et al. (2010)³⁸ met all four criteria of the Mixed Methods Appraisal Tool for quantitative studies. The qualitative studies commonly did not adequately consider how findings might have been related to the researchers’ influence (i.e. through interactions with participants and influence at all stages). This would have been especially important to consider given the highly
sensitive and often stigmatized nature of sexual violence. Additionally, several studies did not adequately consider the settings in which data were collected and the ways in which characteristics of these settings may have led to lack of disclosure of experiences of sexual violence.

There was also high potential for bias in several of the study designs, particularly in the qualitative studies that utilized focus groups for data collection. D’Adesky et al. (2012) note that participatory research designs may be subject to bias because “violence survivors may not be able to separate their experience from another person’s.” D’Adesky et al. (2012) also raised concerns that social workers and sexual violence counselors may not be able to remain neutral in a study setting, and may “over-identify with subjects, or have an emotional reaction during an interview.” Additionally, all of the studies utilized self-report measures, often relying on anecdotal evidence whether in surveys, interviews or focus groups, and self-reported data may be subject to significant recall bias.
RESULTS

The initial searches of Ovid Global Health, PubMed, Web of Science and LILACS resulted in a total of 85 articles. An additional 84 articles were discovered through bibliographic review and citation analysis. After duplicate removal, 147 articles remained and after abstract review, 109 additional articles were removed. Thirty-eight full text articles were assessed for eligibility, leading to the exclusion of 28 articles. Ten articles met the final criteria for inclusion. Figure 3 outlines the data screening and selection process.

FIGURE 3 PRISMA Flow Chart of Screening Process
Main Findings

Of the 10 publications included in the final review, the majority investigated the 2010 earthquake in Haiti (n=7). The other three papers studied the 2007 earthquake in Peru (n=1), Hurricane Noel (2007) in the Dominican Republic (n=1), and Hurricane Mitch (1998) in Honduras and Nicaragua (n=1).

*Figure 4* shows the distribution of publications by natural disaster and geographic location. *Figure 5* shows the distribution of study locations within Latin America and the Caribbean. Four of the studies were qualitative in nature, utilizing structured interviews, focus groups and testimonies to assess experiences of sexual violence. One study was a review paper of interventions for HIV prevention and additionally utilized qualitative methods to explore non-partner sexual violence in urban Haiti. Two studies utilized quantitative methods—one compared results of a household survey to 2009 baseline data, and the other used household surveys in four camps for internally displaced persons and a systematic modeling approach. Two studies utilized a mixed methods approach, combining qualitative and quantitative research designs, and one was a report that used a gender lens to comparatively analyze and examine secondary data to assess social variables before, during and after Hurricane Mitch in Honduras and Nicaragua.

*Figure 4* Graph of publications included in the final review by natural disaster and geographic location

*Figure 5* Map of geographic distribution of study settings
The results of the 10 publications selected for the final review have been summarized and organized in Table 3. Descriptive overviews of methods and main findings of each of the publications are organized by natural disaster and geographic region.

**TABLE 3 Results of Systematic Review**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Alba and Luciano (2008)</td>
<td>Dominican Republic</td>
<td>Hurricane Noel (2007)</td>
<td>Mixed Methods – Qualitative/Quantitative Descriptive Study and Report Interviews of key informants (representatives from governmental organizations, NGOs and community-based groups (n=100) and interviews with a sample of individuals from vulnerable populations including children (n=20), adolescents and young people (n=35), women of reproductive age (n=30), women living with HIV (n=13), seniors (n=34) and persons with disabilities (n=10)</td>
<td>Yes</td>
<td>Yes</td>
<td>High risk of sexual violence, including exploitation and abuse and of unwanted pregnancy and HIV after natural disasters; children were identified as the population most affected by the hurricane, and are particularly vulnerable to sexual violence in shelters</td>
<td>QUAL 3</td>
</tr>
<tr>
<td>Davis and Rookey (2011)</td>
<td>Haiti</td>
<td>Earthquake (2010)</td>
<td>Qualitative Interviews with rape survivors (n=75, ages 5-65)</td>
<td>Yes</td>
<td>Yes</td>
<td>High rates of sexual violence against displaced women and children persist; many survivors had lost family members; few had received medical exams; some clinics did not offer HIV prophylaxis or emergency contraception</td>
<td>QUAL 2</td>
</tr>
<tr>
<td>d’Adesky and PotoFanm+Fi (2012)</td>
<td>Haiti</td>
<td>Earthquake (2010)</td>
<td>Mixed Methods – Qualitative/Quantitative; Structured interviews, surveys and reports from frontline providers (n=66); Field study and surveys of pregnant adolescent girls (n=2,000)</td>
<td>Yes</td>
<td>Yes</td>
<td>64% of girls surveyed were pregnant from rape; 37% engaged in transactional sex; 92% felt sexual violence was more common since the earthquake</td>
<td>QUAL 3 QUAN 3 MM 2</td>
</tr>
<tr>
<td>Kolbe et al. (2010)</td>
<td>Haiti</td>
<td>Earthquake (2010)</td>
<td>Quantitative – 2009 baseline survey of mortality, injury, victimization, food security compared to data from 2010 survey of the same households (n=1,800); used complex samples procedure and adjusted for cluster effects</td>
<td>Yes</td>
<td>No (STDs only listed as a medical problem affecting 0.9% of those interviewed)</td>
<td>Estimated that over 10,000 people (10,813; 95% CI 6,726-14,900) were sexually assaulted during the six-week time period after the earthquake; majority female</td>
<td>QUAN 4</td>
</tr>
<tr>
<td>Joshi et al. (2014)</td>
<td>Haiti</td>
<td>Earthquake (2010)</td>
<td>Qualitative – exploratory sequential design; Grounded Theory 4 focus groups: healthcare providers (n=3, n=8); community advocates (n=8); victims (n=8)</td>
<td>Yes</td>
<td>No (STDs in general, HIV not specifically mentioned)</td>
<td>Earthquake “interacted syndemically with structural factors,” increasing sexual violence and HIV risk; purposeful injury to genitalia signaled STI/HIV risk among victims interviewed; language of sexual violence and within-culture differences can inform better health care and interventions</td>
<td>QUAL 3</td>
</tr>
</tbody>
</table>

*Table 3 Continued on p. 12*
### TABLE 3 Results of Systematic Review (continued)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Logie and Daniel (2016)</td>
<td>Haiti</td>
<td>Earthquake (2010)</td>
<td>Qualitative – guided by critical ethnography; qualitative findings from a non-randomized cohort HIV prevention pilot study Women Participating in Famin an Aksyon Pou Sante Yo HIV Intervention (n=40); In depth individual interviews with Peer Health Educators (n=7)</td>
<td>Yes</td>
<td>Yes</td>
<td>Internally displaced women experience heightened vulnerability to intimate partner violence (IPV); agency is a multi-level, non-linear, incremental process; structural contexts of gender inequity and poverty must be addressed to reduce IPV</td>
<td>QUAL 3</td>
</tr>
<tr>
<td>Rahill et al. (2016)</td>
<td>Haiti</td>
<td>Earthquake (2010)</td>
<td>Review of CDC’s evidence-based interventions for HIV (103 total interventions); Qualitative research exploring non-partner sexual violence in urban Haiti; 2 focus groups (n=16), composed of women who had been gang raped, aged 19-52 years</td>
<td>Yes</td>
<td>Yes</td>
<td>Relative influence of sexual violence on HIV infection for Haitian women &quot;remains obscure.&quot; Women endured &quot;intentionally injurious assaults by multiple perpetrators; all but one woman became pregnant</td>
<td>QUAL 2</td>
</tr>
<tr>
<td>Satterthwaite et al., CHRGJ (2011)</td>
<td>Haiti</td>
<td>Earthquake (2010)</td>
<td>Quantitative – survey of households in 4 camps (n=365); modified systematic sampling approach</td>
<td>Yes</td>
<td>No</td>
<td>14% of survey respondents reported that 1 or more members of their household had experienced rape or unwanted touching; 9% reported that 1 or more household members had been raped or forced into having sex; 86% of victims were women and girls, most were in their early 20s.</td>
<td>QUAN 3</td>
</tr>
<tr>
<td>Delaney and Shrader (2000)</td>
<td>Honduras Nicaragua</td>
<td>Hurricane Mitch (1998)</td>
<td>Report: using a gender lens to comparatively analyze and examine social variables before, during and after the hurricane; synthesis and interpretation of secondary data</td>
<td>Yes</td>
<td>No</td>
<td>Sexual violence increases during the emergency and rehabilitation phases of disaster; gender-based analyses in relief planning efforts could aid in prevention of sexual violence and STDs</td>
<td>QUAL 1</td>
</tr>
<tr>
<td>Ojeda Parra (2008)</td>
<td>Peru</td>
<td>Earthquake (2007)</td>
<td>Qualitative - Testimonies from indirect witnesses and victims of sexual violence (n=3 health care professionals, 2 physicians and 1 psychologist; n=2 victims of sexual violence)</td>
<td>Yes</td>
<td>Yes</td>
<td>Sexual violence is primarily aimed at young women and girls; forced sex increases risk of exposure to HIV; factors including stigma and lack of parental support reduce access to needed health care and HIV prophylaxis after rape</td>
<td>QUAL 2</td>
</tr>
</tbody>
</table>
Descriptive Overview of Included Studies

2010 Earthquake in Haiti

All seven of the publications that investigated sexual violence in the aftermath of the 2010 earthquake in Haiti documented increases in violence, including rape, gang rape, sexual assault, intentionally injurious assault, unwanted touching, child sexual abuse, and intimate partner violence.

Kolbe et al. (2010) surveyed 1,800 households in metropolitan Port-au-Prince, Haiti, on mortality, injuries, victimization, food security and living arrangements post-earthquake, and compared the collected data to an original 2009 survey of the same households. The authors estimated that over 10,000 people (10,813, 95% CI 6,726-14,900) in Port-au-Prince were sexually assaulted during the six-week time period after the earthquake. The authors also found that sexual violence almost exclusively affected women and girls, with almost half of assaults affecting girls under 18 years of age, and nearly 3,000 assaults occurring in children under the age of 12.

A later household survey conducted in 2011 by the Center for Human Rights and Global Justice of the New York University School of Law in four camps for internally displaced persons in Haiti after the earthquake also aimed to assess reported incidents of sexual violence. The survey revealed a shocking statistic that one or more members of a household had been victimized by rape, unwanted touching or both in 14% of those surveyed. The vast majority of reported victims were girls and women (86%), and 72% of female respondents expressed “increased worry” about sexual violence since the earthquake, compared to 61% of male respondents.

The 2012 report, “Beyond Shock: Charting the Landscape of Sexual Violence in Post-Quake Haiti” by d’Adesky and PotoFatm+Fi, a non-profit solidarity coalition supporting the rights, voices and role of women and girls in rebuilding post-earthquake Haiti, details the qualitative and quantitative research that has been conducted on sexual violence in the aftermath of the 2010 earthquake in Haiti. The document reported the results of a 2012 field survey of 2000 pregnant adolescent girls, which found that 64% of the girls surveyed were pregnant as a result of rape, and 37% reported having engaged in transactional or survival sex. Additionally, the investigators found that 92% of the girls surveyed felt that sexual violence/forced sex was more common since the earthquake, and 94% said they were more afraid of sexual violence. The study also documented an increase in early pregnancy among girls under the age of twenty and a strong correlation between sexual violence and early pregnancy. The authors of the report raised concerns about exposures to HIV through rape (especially gang rape), child abuse and survival sex practices, and identified understanding the impact of sexual violence on the acquisition of sexually transmitted diseases as a research gap that should be prioritized.

Rahill et al. (2016) raised similar concerns about HIV exposure through rape. The authors reviewed features of the Center for Disease Control and Prevention’s evidence-based interventions for HIV to identify strategies with the potential to prevent HIV infections as a result of sexual violence. The study investigated non-partner sexual violence in urban Haiti through qualitative research with two focus groups of women who had been gang raped. The authors found that many of the women participating in the study had endured “intentionally injurious assaults by multiple perpetrators” and all but one of the women had become pregnant as a result of the assault. The implications of these findings are that in addition to having
unwanted pregnancies, the women’s vaginal injuries had also placed them at increased risk of sexually transmitted infections, including HIV/AIDS. Only one of the women had been tested for HIV and knew her status.

Joshi et al. (2014) also documented the infliction of intentionally injurious genital injuries among victims of sexual violence in their investigation of a crucial component of both research and health communications around sexual violence – language. Joshi et al. (2014) documented within-culture differences in both the language used to describe sexual violence and to communicate health effects of it. The investigators ran four focus groups composed of health care providers, community advocates and victims of sexual violence and utilized “exploratory sequential qualitative design and Grounded Theory” to study language and terminology utilized when speaking about sexual violence. The authors found that there were striking differences between the words and phrasing employed by health care workers compared to victims. These differences in semantics have practical implications in that they could inform best practices for screening and identifying patients who have experienced sexual violence. This research also suggests that a lack of nuanced and culturally informed communication around sexual violence on the part of health care workers may deter patients from reporting and may be a barrier to receiving needed care. The authors also documented purposeful genital injuries that had been inflicted on victims interviewed and increased HIV risk from the injuries, as well as pregnancies resulting from rape.

Logie and Daniels (2016) investigated vulnerability to intimate partner violence among internally displaced women in Haiti as a result of poverty and disrupted community networks. Interviews with women participating in a non-randomized cohort HIV prevention pilot study revealed multiple forms of intimate partner violence, including sexual violence, and how both sexual violence and gender disparities in terms of power to negotiate safer sex practices such as condom use, can place women at high risk for HIV and other sexually transmitted infections. The authors assert that intimate partner violence is “one form of structural violence that is connected to larger gender norms and poverty,” and that interventions are needed to combat structural factors that silence and constrain women’s agency to ultimately promote gender equity and address intimate partner violence among internally displaced women.

Davis and Bookey (2011) emphasized a rights-based approach to understanding and combating sexual violence. The authors stated that the right to be free from sexual violence should be considered a fundamental component of the right to health, and that sexual violence is “one of the most pervasive violations of universal human rights … [affecting] half of the world’s population.” The article reviews the history of sexual violence in Haiti to provide context for the post-earthquake setting, and discusses findings from qualitative analyses of the safety and security crisis affecting Haitian women disproportionately. Interviews were conducted with seventy-five rape survivors (ages 5-65), and found a strong correlation between “the absence of even minimal health rights, such as food, clean water, and housing, and an increased vulnerability to sexual violence.” Many of the women interviewed expressed having lost family members who previously provided physical security and a source of income, which rendered them more vulnerable to violence. The majority of the women had not received a medical exam after they were assaulted either because they could not locate or access health services, or because they feared retaliation and stigma, and some of the clinics that were accessed did not offer HIV prophylaxis or emergency contraception. The authors concluded, “while existing international standards clearly articulate the need to address and prevent sexual violence committed against displaced women, high rates of sexual violence against displaced women and
This statement underscores the discrepancy between international standards (and law), and the disturbing reality of sexual violence on the ground that was captured in all seven of the papers investigating the post-disaster context in Haiti.

2007 Earthquake in Peru

Ojeda Parra (2008) studied the effects of the earthquake that struck Peru in 2007 and is considered the most damaging to have hit the country in a century. The author collected testimonies from indirect witnesses and victims of sexual violence in the days following the earthquake. The accounts provided by the health care workers interviewed referenced multiple cases of sexual violence. One excerpt from the testimony of a specialized physician drew attention to the challenges of preventing HIV in cases of sexual violence: “The girl was raped and she became pregnant at age 12…and she was brought in for examination only because she [was] pregnant, if not she would not have received any care at all…but how can you make them understand, both the parents and the girls themselves, that they should go to a health facility after a rape?”

Ojeda Parra stressed the ways in which forced sex places victims at risk of exposure to HIV, the complex web of factors that prevented those in need from receiving prophylaxis, the dearth of policies and strategies to prevent sexual violence, and the need to understand and disseminate the links between sexual violence and HIV.

1998 Hurricane Mitch in Honduras and Nicaragua

“Gender and Post-Disaster Reconstruction: The Case of Hurricane Mitch in Honduras and Nicaragua” is a report written by Delaney and Shrader (2000) that investigated the “social variables surrounding disaster vulnerability, described gender differentiated impacts and opportunities during phases of the disaster cycle, and made recommendations to mitigate gendered vulnerabilities to the effects of disasters.” The authors call attention to one “second generation disaster” that takes place during the emergency and rehabilitation phases of disasters – increased sexual violence. The report states that a number of shelters witnessed increased sexual violence, coerced prostitution (particularly among adolescent girls), and victimization leading to physical and psychological trauma. However, beyond asserting that gender analyses during relief planning efforts could “minimize rape, incest, intra-familial violence, STDs,” the report makes no explicit mention of concerns about HIV acquisition from sexual violence.

2007 Hurricane Noel in the Dominican Republic

Alba and Luciano (2008) conducted a mixed methods descriptive study, interviewing both key informants and a sample of individuals from various at-risk populations in the Dominican Republic to assess sexual and reproductive health and violence after the 2007 hurricane. There did not appear to be significant differences in how sexual violence was experienced in the different geographic regions surveyed. Between 7.4 and 11.1% of women (ages 15-49 years) had ever experienced sexual violence and about 30% of women had ever experienced emotional, physical or sexual violence by an intimate partner. The authors identified children as the population most affected by the hurricane, determining that they are particularly vulnerable to sexual violence in shelters. The authors concluded that the post-hurricane context in the
Dominican Republic was characterized by high risk of sexual violence, including exploitation and abuse and of unwanted pregnancy and HIV.\textsuperscript{44}

\textit{Contextual Factors of the Post-Disaster Context & Sexual Violence Vulnerability}

In addition to identifying existing literature on sexual violence in the post-disaster context in Latin America and the Caribbean and assessing whether ostensible increases in incidence of sexual violence and HIV infection in the post-disaster context are supported by the literature, this review also aimed to describe contextual factors of the post-disaster context that exacerbate sexual violence vulnerabilities. The identification of the most salient contextual factors contributing to vulnerability to sexual violence in the post-disaster context was not expressly defined as the primary objective of any of the studies included in this review. However, several important themes emerged from the collective data, which provide insight into the contextual factors unique to the post-disaster context that may increase sexual violence vulnerability and should be targeted by interventions aiming to reduce sexual violence and its negative health consequences. Factors that were identified in multiple studies as definitive contributors to sexual violence vulnerability are included in Table 4. The different types of sexual violence that were documented by the included studies and to which disaster-affected populations may be vulnerable as a result of contextual factors are summarized in Table 5.

\begin{table}[h]
\centering
\begin{tabular}{|l|}
\hline
\textbf{Factors Contributing to Vulnerability to Sexual Violence} \\
\hline
Gender inequality \\
Povety \\
Collapse of social infrastructure \\
Lack of security (especially secure housing) \\
Barriers to healthcare access/lack of healthcare \\
Lack of economic opportunity \\
Lawless environment \\
Disruption of familial and community support systems \\
Deaths of parents, guardians, protectors \\
Gendering of poverty \\
Stigma \\
\hline
\end{tabular}
\end{table}

\begin{table}[h]
\centering
\begin{tabular}{|l|}
\hline
\textbf{Types of Sexual Violence} \\
\hline
Gender-Based Violence (general) \\
Child Sexual Abuse \\
Exploitation \\
Sex Trafficking/Sex Slavery \\
Survival Sex/Coerced Sex \\
Forced Sex \\
Rape \\
Sexual Assault \\
Unwanted Touching \\
Gang Rape \\
Genital Mutilation/Intentionally Injurious Injury from Rape \\
Intimate Partner Sexual Violence \\
\hline
\end{tabular}
\end{table}

All 10 of the studies included in the final review provided evidence of increased sexual violence in the post-disaster context, although there was variability with regard to the types of sexual violence studied. Several important themes emerged from the data. The most frequently studied type of sexual violence was rape, including gang rape. “Forced sex,” “sexual assault” and “assault by multiple perpetrators” were terms employed by authors to describe broader categories of sexual violence, and which included rape and gang rape as well as other forced sexual acts.

Structural factors identified as contributing to sexual violence vulnerability include lack of security, particularly in camps for internally displaced persons. In these settings, tents are often used for shelter and do not provide any protection from forced entry. Additionally, children
are often left alone in tents for brief or extended periods of time as parents or guardians seek work, food and necessary supplies. Several of the studies mentioned that the ways in which camps were constructed created vulnerabilities by necessitating that individuals travel some distance, often alone, to use bathroom facilities, collect water, and carry out other basic needs. On a broader scale, disasters commonly destroy infrastructure, which may include elements of health care systems and may place enormous strain on surviving systems, thereby exacerbating barriers to health care access and needed services. In addition to structural factors, several studies cited social disruption as a major factor leading to increased sexual violence vulnerability. Children and adolescents are often rendered vulnerable to violence as a result of losing parents or guardians during a disaster. Social infrastructure may collapse entirely in the post-disaster context, disrupting support systems and creating a “lawless environment” where vulnerable individuals have no means of protecting themselves from violence, and have few (if any) options for recourse when violence occurs.

Gender inequality was the factor that was most consistently identified as contributing to sexual violence vulnerability. The included studies unanimously identified women and girls as the populations at highest risk for experiencing sexual violence. Gender inequality refers to the unequal power distribution of women relative to men in social hierarchies, and takes many forms including unequal pay, educational opportunity, representation in government and decision-making bodies, gender roles, discrimination, and gender-based violence, among other manifestations. The finding that gender inequality contributes prominently to sexual violence vulnerability suggests that gender gaps in terms of power and agency may widen and gender-based violence may escalate in the post-disaster context.

DISCUSSION

All 10 of the studies included in the final review provided evidence supporting an increase in sexual violence in the post-disaster context, and identified women and girls as the group at highest risk for victimization. This review corroborated results from studies of sexual violence and HIV in conflict settings: at the population level, sexual violence is not significantly associated with increased HIV incidence, but at the individual level, sexual violence is a strong risk factor for HIV acquisition. Rape and gang rape in particular place victims at a higher risk for contracting HIV due to increased risk of genital injury, and in the case of gang rape, perpetration by multiple assailants. A combination of social and structural factors contribute to enhanced vulnerability to sexual violence in the post-disaster context, the most prominent being gender inequality. This review demonstrates that preventing sexual violence in the post-disaster context must be made a priority in emergency preparedness, disaster management and humanitarian relief efforts, and that substantive reductions in sexual violence will only become a reality when pervasive gender inequalities cease to exist.

Health Effects of Sexual Violence

In addition to documenting increased incidence of sexual violence post-disaster, the publications documented increases in several health outcomes related to sexual violence – in particular, trauma-related psychological symptoms and unwanted pregnancy. According to the Center for Disease Control and Prevention’s Division of Violence Prevention, sexual violence has physical, psychological and social consequences, and sexual violence victimization is
associated with risk behaviors, including engaging in high-risk sex, substance abuse, and unhealthy diet-related behaviors. Physical consequences include unwanted pregnancy, chronic pain, gastrointestinal and gynecological complications, headaches, cervical cancer, sexually transmitted infections, and genital injuries. Psychological consequences may include feelings of anxiety, shame and distrust, and symptoms of post-traumatic stress disorder (PTSD) such as flashbacks and sleep disturbances. Survivors of sexual violence may also experience chronic psychological consequences such as depression, anxiety, suicidal ideation, low self-esteem, and PTSD. Social consequences of sexual violence associated with stigma and shame may include isolation or ostracism from one’s family or community, and lack of social support.

A primary objective of this review was to investigate one health outcome of sexual violence in particular – HIV. The relative influence of sexual violence on HIV infection at the population level could not be discerned from the publications included in this review. However, several studies were able to shed light on elements of the post-disaster context that increase individual risk of becoming infected with HIV from an experience of sexual violence. Interviews conducted by Davis and Bookey (2011) with Haitian rape survivors revealed that few survivors sought and received medical attention after an assault, and when they did, some clinics did not offer HIV prophylaxis or did not have any such medications in stock. These findings were corroborated by Ojeda Parra (2008), who observed a similar situation in Peru. These studies captured the powerful influence of stigma that drives both under-reporting of incidents and dissuades survivors from seeking medical care, and the fact that health care systems in the post-disaster context are often over-burdened, highly under-resourced and ill-equipped to meet the needs of survivors.

Two studies documented disturbing accounts of gang rape, which is associated with a high risk of both HIV and unwanted pregnancy. Rahill et al. (2006) ran focus groups with 16 women who had been gang raped in Haiti and found that the women had endured “intentionally injurious assaults by multiple perpetrators.” All of the women, save one, had become pregnant as a result of the rapes. Joshi et al. (2014) documented a similar trend of purposeful genital injuries that had been inflicted upon women in Haiti. Genital injuries that involve broken skin can increase HIV transmission risk, particularly if objects are used to penetrate the body or if cutting or deliberate wound infliction occurs. The likelihood of HIV infection from rape also increases if there are multiple perpetrators, because it is more likely that genital injury will occur and that one or more of the perpetrators are infected with HIV. The studies included in this review provided evidence supporting an association between sexual violence (especially gang rape and violence involving intentional injury) and increased risk of HIV. However, neither this review nor any individual studies provided sufficient evidence to support increased HIV prevalence driven by sexual violence at the population level.

Limitations

The strength of evidence identified for this review was variable but generally of low to medium quality. It should be noted that there is a lack of consensus in the scientific community about best practices for the evaluation of qualitative literature, and few tools exist for the quality assessment of complex systematic literature reviews that unite qualitative, quantitative and mixed methods studies. In addition to the variable quality of evidence of the included publications, there are other limitations to the research findings and to the overall review. The majority of included studies had notably small sample sizes, with the exception of the two
This review identified only 10 articles on sexual violence in the post-disaster context in Latin America and the Caribbean that met the inclusion criteria. Additional, high quality research is urgently needed in this area to better understand the dynamics of sexual violence in the post-disaster context and to inform future interventions, especially given that the region remains at high risk for natural disasters and the frequency of disasters will likely increase with continued climate change. Interventions aiming to reduce sexual violence in the post-disaster context should target specific structural factors by boosting camp security, strengthening health systems, and creating economic opportunities to alleviate poverty, and social factors by working to reduce stigma and providing services and protection for the most vulnerable groups, including children and adolescents. The harsh reality of the matter, however, is that sexual violence will persist until its root causes, including the systems that endorse and perpetuate gender inequality, are dismantled and replaced by systems that empower women, girls and all those who are systematically disadvantaged.

_Future Research Directions_

The nearly exclusive focus of these studies on women and girls and the selection of study participants from these populations represent limitations affecting the body of existing literature on sexual violence, given that there may be other groups that are highly vulnerable to experiencing sexual violence that have not yet been identified or well studied. Orphans, boys, disabled persons and lesbian, gay, bisexual and transgendered (LGBT) individuals represent other groups considered to be at potentially high risk for sexual victimization, but are absent from the literature. Several publications that were ultimately excluded during the full text review phase investigated these groups, including Nicholas et al. (2012), who estimate that upwards of 380,000 children were displaced by the 2010 Haitian earthquake, and cite displacement, poverty, sexual exploitation, and sexual abuse of child laborers as risk factors for childhood HIV acquisition. Furthermore, children who are not orphans but acquire HIV may be abandoned by families due to stigma or inability to care for the child. In a commentary paper, Malow et al.
(2010) raise similar concerns about increased HIV risks for orphaned children involved in survival behaviors and at risk for trafficking, particularly after deaths of parents and guardians in the earthquake.\textsuperscript{49} Zea et al. (2013) investigated “experiences of internal displacement among Colombian gay and bisexual men and male-to-female transgender individuals,” and illuminated the ways in which gay, bisexual and transgendered individuals can be particularly vulnerable to sexual violence and HIV.\textsuperscript{50} There is an urgent need to expand upon the work of Nicholas et al. (2012), Malow et al. (2012), and Zea et al. (2013) to better understand if there are populations in addition to girls and women that are highly vulnerable to sexual violence and HIV in the post-disaster context. While expanding the scope of sexual violence research, parallel efforts must also be made to scale up and improve the quality of research being conducted with the populations already known to be disproportionately affected by sexual violence – women and girls.

**Recommendations**

There is an urgent need to strengthen global capacity to prevent sexual violence in humanitarian crises caused by natural disasters. Understanding the dynamics of sexual violence, factors that increase vulnerability and drivers of sexual violence perpetration must be made an international research priority. The existing literature on sexual violence in post-disaster contexts is woefully lacking, as are surveillance systems for tracking and monitoring incidents of sexual violence and services to support and provide medical care for survivors. High quality research initiatives are urgently needed to inform coordinated efforts to provide protection against sexual violence for vulnerable populations and to provide necessary short- and long-term care for survivors in the post-disaster context.

Lastly, it is absolutely essential to recognize that incidents of sexual violence in the post-disaster context do not occur in isolation, nor are they anomalies – they epitomize the structures of power that societies uphold in the non-disaster context. Sexual violence is pervasive in every corner of the world and conditions of the post-disaster context simply exacerbate an existing problem. The prevention and elimination of sexual violence in non-disaster contexts must also be a global priority.
APPENDIX 1 Search Strategy

Ovid Global Health Search Strategy:

<table>
<thead>
<tr>
<th>#</th>
<th>Searches</th>
<th>Results</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>from 21 keep 1-16</td>
<td>16</td>
<td>Advanced</td>
</tr>
<tr>
<td>21</td>
<td>15 and 19 and 20</td>
<td>16</td>
<td>Advanced</td>
</tr>
<tr>
<td>20</td>
<td>13 or 16 or 17 or 18</td>
<td>3571</td>
<td>Advanced</td>
</tr>
<tr>
<td>19</td>
<td>5 or 6 or 7 or 8 or 9 or 10</td>
<td>11980</td>
<td>Advanced</td>
</tr>
<tr>
<td>18</td>
<td>forced sex.mp.</td>
<td>136</td>
<td>Advanced</td>
</tr>
<tr>
<td>17</td>
<td>sex trafficking.mp.</td>
<td>39</td>
<td>Advanced</td>
</tr>
<tr>
<td>16</td>
<td>sexual assault/ or &quot;rape (trauma)&quot;/ or sexual abuse/</td>
<td>2636</td>
<td>Advanced</td>
</tr>
<tr>
<td>15</td>
<td>3 or 14</td>
<td>157230</td>
<td>Advanced</td>
</tr>
<tr>
<td>14</td>
<td>HIV infection.mp. or HIV infections/</td>
<td>108833</td>
<td>Advanced</td>
</tr>
<tr>
<td>13</td>
<td>sex offenses.mp. or sexual abuse.sh. or child abuse.sh.</td>
<td>3172</td>
<td>Advanced</td>
</tr>
<tr>
<td>12</td>
<td>internally displaced.mp. or displacement.sh.</td>
<td>353</td>
<td>Advanced</td>
</tr>
<tr>
<td>11</td>
<td>refugee camp.mp.</td>
<td>280</td>
<td>Advanced</td>
</tr>
<tr>
<td>10</td>
<td>emergencies/ or natural disasters/ or refugees/ or emergency relief/</td>
<td>8369</td>
<td>Advanced</td>
</tr>
<tr>
<td>9</td>
<td>avalanches/ or landslides/</td>
<td>132</td>
<td>Advanced</td>
</tr>
<tr>
<td>8</td>
<td>floods/ or natural disasters/</td>
<td>3440</td>
<td>Advanced</td>
</tr>
<tr>
<td>7</td>
<td>earthqakes/</td>
<td>1380</td>
<td>Advanced</td>
</tr>
<tr>
<td>6</td>
<td>natural disasters/ or emergencies/ or floods/ or volcanoes/</td>
<td>6231</td>
<td>Advanced</td>
</tr>
<tr>
<td>5</td>
<td>disasters/ or natural disasters/ or drought/</td>
<td>5880</td>
<td>Advanced</td>
</tr>
<tr>
<td>4</td>
<td>sexually transmitted diseases/ or reproductive health/ or sexual health/</td>
<td>32026</td>
<td>Advanced</td>
</tr>
<tr>
<td>3</td>
<td>1 or 2</td>
<td>157230</td>
<td>Advanced</td>
</tr>
<tr>
<td>2</td>
<td>HIV.mp. or exp human immunodeficiency viruses/</td>
<td>157230</td>
<td>Advanced</td>
</tr>
<tr>
<td>1</td>
<td>HIV.mp. or exp human immunodeficiency viruses/</td>
<td>157230</td>
<td>Advanced</td>
</tr>
</tbody>
</table>

Web of Science Search Strategy:
Keyword combinations of “HIV” AND “sexual violence” OR “rape” OR “sexual assault” AND “natural disaster”, and synonyms were searched. Additional key word combinations were searched after reviewing the “key word lists” of relevant papers from the initial search. The Web of Science citation analysis functions were utilized to find similar, relevant articles and articles that had been cited by search results or that were contained in the reference lists of the search results.

LILACS Search Strategy:
Subject descriptors: “HIV infections”; “Disasters”; “Reproductive Health” (tw:(hiv)) AND (tw:(rape OR sexual assault OR sexual violence)) AND (tw:(disaster)) AND (instance:"regional") and (tw:(hiv)) AND (tw:(disasters)) AND (instance:"regional") AND (pais_assunto:("caribe" OR "haiti" OR "america do sul" OR "brasil" OR "caribe ingles" OR "jamaica") AND la:("en"))
APPENDIX 2 Mixed Methods Appraisal Tool Criteria and Template

PART I. MMAT criteria & one-page template (to be included in appraisal forms)

<table>
<thead>
<tr>
<th>Type of mixed methods study components or primary studies</th>
<th>Methodological quality criteria (see tutorial for definitions and examples)</th>
<th>Response</th>
<th>Yes</th>
<th>No</th>
<th>Can’t tell</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screening questions (for all types)</td>
<td>● Are these clear qualitative and quantitative research questions (or objectives)(^a)? or a clear mixed methods question (or objective)(^a)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>● Do the collected data allow address the research question (objective)? E.g., consider whether the follow-up period is long enough for the outcome to occur (for longitudinal studies or study component).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Further appraisal may be not feasible or appropriate when the answer is &quot;No&quot; or &quot;Can’t tell&quot; to one or both screening questions.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Qualitative</td>
<td>1.1 Are the sources of qualitative data (archives, documents, ethnograms, observations) relevant to address the research question (objective)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.2 Is the process for analyzing qualitative data relevant to address the research question (objective)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.3 Is appropriate consideration given to how findings relate to the context, e.g., the setting, in which the data were collected?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.4 Is appropriate consideration given to how findings relate to researchers’ influence, e.g., through their interactions with participants?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Quantitative randomized controlled trials</td>
<td>2.1 Is there a clear description of the randomization (or an appropriate sequence generation)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.2 Is there a clear description of the allocation concealment (or blinding when applicable)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.3 Are there complete outcome data (60% or above)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.4 Is there low withdrawal/drop-out (below 30%)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. quantitative non-randomized</td>
<td>3.1 Are participants (organizations) recruited in a way that minimizes selection bias?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.2 Are measurements appropriate (clear origin, or validity known, or standard instrument), and absence of contamination between groups when appropriate regarding the exposure/intervention and outcomes?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.3 Are the groups being compared (exposed vs. non-exposed, with intervention vs. without, case vs. control), are the participants comparable, or do researchers take into account (control for) the difference between these groups?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.4 Are there complete outcome data (60% or above), and, when applicable, an acceptable response rate (60% or above) or an acceptable follow-up rate for cohort studies (depending on the duration of follow-up)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Quantitative descriptive</td>
<td>4.1 Is the sampling strategy relevant to address the quantitative research question (quantitative aspect of the mixed methods question)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.2 Is the sample representative of the population under study?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.3 Are measurements appropriate (clear origin, or validity known, or standard instrument)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.4 Is there an acceptable response rate (60% or above)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Mixed methods</td>
<td>5.1 Is the mixed methods research design relevant to address the qualitative and quantitative research questions (or objectives), or the qualitative and quantitative aspects of the mixed methods question (or objective)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.2 Is the integration of qualitative and quantitative data (or results) relevant to address the research question (objective)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.3 Is appropriate consideration given to the limitations associated with this integration, e.g., the divergence of qualitative and quantitative data (or results) in a translation design?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Criteria for the qualitative component (1.1 to 1.4), and appropriate criteria for the quantitative component (2.1 to 2.4, or 3.1 to 3.4, or 4.1 to 4.4), must be also applied.

\(a\) These two items are not considered as double-counted items since mixed methods research, (1) there may be research question (quantitative research) or research objectives (qualitative research), and (2) data may be integrated, and/or qualitative findings and quantitative results can be integrated.
References


