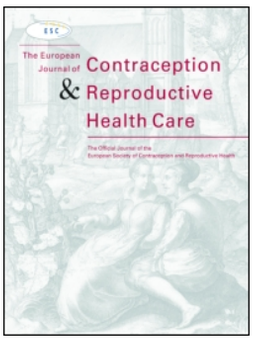

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REVIEW

The impact of disasters on contraception in OECD member countries: a scoping review

Benjamin Freed, Sarah Hillman, Saran Shantikumar, Debra Bick, Jeremy Dale and Julia Gauly

Warwick Medical School, University of Warwick, Coventry, UK

ABSTRACT

Objectives: Review evidence is lacking about how contraception is affected by severe social disruption, such as that caused by the COVID-19 pandemic. The purpose of this scoping review was to explore the impact of natural and man-made disasters on contraception in OECD member countries.

Methods: Manual searches and systematic searches in six electronic databases were conducted with no language restrictions. All articles were screened by at least two researchers. The data were analysed thematically.

Results: 108 articles were included. Most focussed on the Zika virus outbreak ($n = 50$) and the COVID-19 pandemic ($n = 28$). Four key themes were identified: importance of contraception during disasters, impact of disasters on contraceptive behaviour, barriers to contraception during disasters and ways of improving use of contraception during disasters. Despite efforts to increase access to contraception including by transforming ways of delivery, barriers to use meant that unmet need persisted.

Conclusions: To prevent adverse health outcomes and reduce health costs as a result of failure to have access to contraception during disasters, there is a need to intensify efforts to remove barriers to use. This should include increasing access and information on methods of contraception and their side effects (e.g., menstrual suppression) and making contraception freely available.

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KEYWORDS
Contraception; COVID-19; disaster(s); OECD countries; Zika; ZKV

Introduction

Major disasters, such as epidemics, cause significant disruption to society and place considerable pressure on public health, including reproductive health services [1]. With reduced access to family planning advice and supplies, unplanned pregnancies may increase [2].

Disasters are associated with increased rates of early pregnancy loss, stillbirth and premature birth, together with increased birth rates [3–7].

Hence, in disaster response planning it is important to consider the need to mitigate the impact on women's reproductive health, including maintaining their access to and use of contraception. Until now, a comprehensive review of the impact of major disasters on contraception is lacking.

The objective of this scoping review was to explore the impact of disasters on provision and use of contraception in high-income countries, and to contribute to shaping policies that proactively address reproductive health issues at times of disaster. The review was undertaken during the COVID-19 pandemic, and we approached it from the perspective of discovering what was known about ways of maintaining and increasing access to contraception and preventing the health burden shift towards abortion and pregnancy care [8].

Methods

The scoping review followed the PRISMA-ScR checklist [9] (see Supplementary File 1). Its design was informed by Arksey and O'Malley's framework [10] and the Joanna Briggs Institute Reviewers' Manual [11].

Inclusion and exclusion criteria

All types of evidence providing insight into the impact of disasters on contraception were included. The types of disasters considered for this review were informed by Shaluf et al. [12]. All contraceptive methods except the lactational amenorrhoea method, fertility awareness-based contraceptive methods, withdrawal and abstinence were considered.

To inform policy and research in the UK and countries with similar economic backgrounds, literature pertaining to Organisation for Economic Co-Operation and Development (OECD) member countries was used [13]. All settings in which contraceptive methods are available were included. Table 1 provides an overview of all inclusion and exclusion criteria.

Search strategy

Medline, Embase, Web of Science, Scopus, Cinahl and the Cochrane Library were searched without language restrictions. The search strategy was based on the Population, Concept and Context (PCC) strategy [14] and compiled by the review team and a specialist librarian (SJ). The choice of databases and search terms was informed by previous reviews in the area of reproductive health [13,15] and

CONTACT Julia Gauly julia.gauly@warwick.ac.uk Warwick Medical School, University of Warwick, Medical School Building, Coventry, CV4 7HL, UK.
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Table 1. Inclusion and Exclusion Criteria for scoping review.

Inclusion and exclusion criteria	
Type of disaster	
Inclusion	The following types of disasters were included where they caused *(a)* disruption of freedom of movement, and/or *(b)* disruption and delivery of resources/ services/sources of income: • Natural (physical) disasters: earthquakes, tsunamis, hurricanes, volcanic eruptions, tropical storms, floods, acute disease outbreaks (e.g., pandemics and epidemics), cyclones, typhoons, drought, famine, fires, wildfires • Man-made disasters: non-conventional wars (nuclear, chemical, biological), conventional wars (wars, civil unrest, civil conflict, armed conflicts), radioactive hazard release; technological disasters (e.g., pollution; explosions)
Exclusion	• HIV/AIDS epidemic (where no disruption of one of the above criteria listed under *a* or *b* was caused) • Political changes (not leading to civil/armed conflicts and no disruption of one of the above criteria listed under *a* or *b* was caused)
Type of contraception	
Inclusion	• Hormonal contraception, long-acting reversible contraceptives, injectable contraceptives, contraceptive vaginal rings, contraceptive patches, barrier contraception, spermicide, intentional sterilisation
Exclusion	• Lactational amenorrhoea method, fertility awareness-based method, withdrawal method, abstinence
Types of Articles	
Inclusion	• Primary research studies (qualitative, quantitative and mixed methods studies); any type of literature reviews • Grey literature and dissertation theses • Abstract-only articles, conference abstracts, or proceedings published healthcare guidelines • Correspondence, viewpoints
Settings	
Inclusion	• Evidence from OECD member countries on all settings in which contraception is available with or without prescription • Evidence on military personnel from OECD member countries when deployed in areas of disasters in and outside OECD member countries

adapted for each database (see Appendix S1). Articles were also searched manually and reference lists of all included references were screened. Since the field of contraception is changing over time with contraceptive methods becoming more effective [16], only literature published after January 2010 was included to ensure findings could inform current practice. An initial search was conducted in June 2020 and a secondary search in December 2020.

Selection of studies

In a first stage, the deduplicated titles and abstracts were screened against the inclusion criteria by two researchers independently in Endnote X9, with discrepancies resolved through discussion with another reviewer. In a second stage, the full texts of all potentially relevant articles were retrieved and dual-screened. Discrepancies were discussed and if a consensus was not reached a third author was consulted. A reason for exclusion was recorded at this stage.

Data extraction

A data extraction form was developed and piloted on five randomly selected references (see Appendix S2).

Data synthesis

Thematic analysis can be used to synthesise qualitative and quantitative evidence [17] and was conducted based on the three steps outlined by Thomas and Harden [18]. In the first step, the extracted data were coded inductively according to its meaning and content line-by-line. In a second step, all codes were organised into 'descriptive' themes. The underlying analytical themes were identified in a third step.

Results

Literature search

In total, 108 articles were included (see Supplementary File 2). An overview of the search results is provided in Figure 1.

Description of included articles

Most of the articles included related to the Zika virus (46.3%, 50/108) and the COVID-19 pandemic (25.9%, 28/108) and originated from the Americas (76.9%, 83/108; two of which discussed both the US and Latin America). Less than 50% of articles were original research articles (48.1%, 52/108). Table 2 provides an overview of the included articles.

Key themes

Four overarching themes were identified (see Figure 2).

Importance of contraception during disasters. Nine articles [19–27], four of which were original research papers [19,21,24,26], gave insight into the importance of contraception during disasters. During the Zika epidemic, contraception was crucial to reduce Zika-related microcephaly [19–21] and related health care costs [21]. During the COVID-19 pandemic, access to contraception was deemed as particularly important because the impact of COVID-19 on maternal and foetal well-being were not clearly understood [22], and because women's plans for pregnancy may alter depending on personal experience, financial and/or medical concerns [23]. For deployed servicewomen, contraception was important not only to prevent pregnancy but also for menstrual suppression or regulation [24–27].

Ways of improving use of contraception during disasters. Three subthemes relating to the impact of disasters on actions relating to improving use of contraception were identified: 'Communication with the public'; 'Access to contraception'; and 'Provision of contraception'.

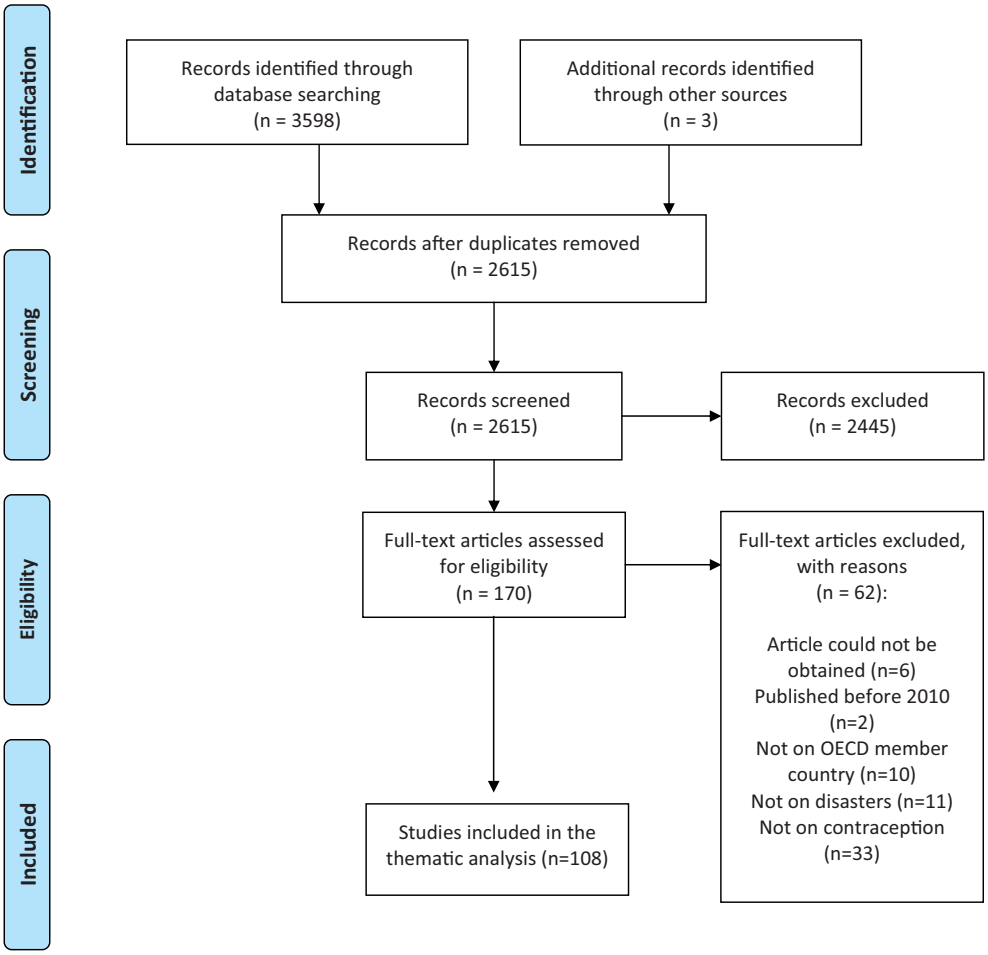

Figure 1. Overview of search results.

Communication with the public. Twelve articles [28–39], six of which were original research papers [28,30,33–35,37], gave insight into communication with the public during disasters. Health communication campaigns spread through billboards, the radio, newspaper adverts, and social media and sexual education programs were used by health providers to provide information on how the Zika virus spreads [21,31,32,34–36]. However, message content for the public on the modes of transmission of Zika and recommendations to use condoms in Zika-affected areas was found to not be strong enough [36,37]. During the COVID-19 pandemic, the WHO recommended providing more information about contraception and available services through pharmacies and online platforms [38]. Some health providers who had to close provided information on their doors on where to access emergency contraception [40].

Access to contraception. Thirty-three articles [8,20,23,27,38,40–67], eight of which were original research papers [45,53,58,59,61,66–68], considered access to contraception during disasters. During the Zika virus epidemic, strategies to increase access to contraception included: the removal of financial barriers to services [32,56,66,67], training of health care staff on reversible methods of contraception [56,57,66,67] and the distribution of condoms [20]. However, since some people perceived condoms as burdensome [58,59] and as the choice not to use male condoms may not be a shared decision [60], access to a broad range of contraceptive services, including long-acting reversible contraception (LARC) [20,32,61] was also considered important to prevent Zika-related adverse pregnancy and birth outcomes [62].

During the COVID-19 pandemic, strategies to promote access included: providing postpartum and post-abortion contraception [38,63,64]; offering LARC and permanent contraception where possible [38]; increasing prescription-free provision of contraception [8,23,40]; and providing advanced prescriptions [40], automatic extension and refill of prescriptions [38,65]. To increase access to contraception for servicewomen during deployment, contraception was provided for free or low cost [27].

Provision of contraception. Sixteen articles [8,22,25,38–40,63,65,69–76], of which four were original research papers [71–73,76] provided insight into the provision of contraception during disasters. Servicewomen reported being able to obtain oral contraception refills through mail-order and local treatment facilities during deployment [25]. During the COVID-19 pandemic, some health providers closed [65,70,71], and in-person visits were mainly used for contraceptive service users attending for LARCs [72,73] under special measures (e.g., screening people for COVID-19 symptoms, wearing PPE, cleaning rooms after each visit). While access to discontinuation services (e.g., removal of IUDs and implants) was recommended to be delayed as much as possible [38,65,74], insertion of IUDs, contraceptive implants and permanent contraception continued in many but not all areas [38]. Curb-side administration for contraceptive injection and pickup of condoms were

Table 2. Description of included articles.

Description of included articles
Breakdown of included articles by disasters
Zika virus ($n = 50$)
COVID-19 ($n = 28$)
Wars and civil unrests ($n = 14$)
Refugee crises ($n = 11$)
Earthquakes ($n = 2$)
Hurricanes ($n = 1$)
Disaster preparedness ($n = 1$)
HIV epidemic ($n = 1$)
Breakdown of included articles by study design
Original research studies ($n = 51$)
Literature Reviews ($n = 28$)
Correspondences ($n = 7$)
Viewpoints ($n = 7$)
Commentaries ($n = 4$)
Guidelines/policies ($n = 4$)
Reports ($n = 4$)
Presentation (n = 1)
Study protocols ($n = 2$)
Breakdown of included articles by continent/region/country
North America ($n = 75$)*
South and Central America ($n = 18$)*
Europe ($n = 9$)
Asia ($n = 5$)
Oceania ($n = 1$)
Turkey ($n = 4$)
Breakdown of included articles by year of publication
2010 ($n = 3$)
2011 ($n = 2$)
2013 ($n = 1$)
2014 ($n = 1$)
2015 ($n = 2$)
2016 ($n = 13$)
2017 ($n = 22$)
2018 ($n = 17$)
2019 ($n = 9$)
2020 ($n = 38$)

*NB. 4 papers discussed both North America and the South and Central America region and are counted in both of these categories.

considered or used in some areas [39,63]. Telehealth (use of phone and video consultations) was used to counsel, prescribe and refill prescriptions for contraception, to manage complications related to contraception and to triage patients for in-person visits required for the insertion of LARC [8,22,38,40,65,72,73,75–77] and had several advantages (e.g., convenience, increased access, reduced exposure to COVID-19) but also some disadvantages (e.g., quality of communication, technological issues, difficulties picking up on safeguarding issues, domestic abuse, teenage pregnancy) [8,72].

Barriers to use of contraception during disasters. Twenty-eight articles [20,25,27,40,62,68,74,75,78–97], of which twelve were original research articles [33,68,76,78–80,83,86,87,89,91,97], gave insight into barriers to sustaining or commencing use of contraception during disasters.

Barriers included policies (e.g., inconsistent refill policies on contraception across different states in the US; pharmacists' and American employers 'right to decline to cover contraceptives if doing so violates their religious beliefs or moral convictions'; insurance companies denying coverage for contraception) [74,84,85] and institutional or cultural obstacles (e.g., education sectors and Catholic church preventing education on condoms) [68].

Fear of contracting COVID-19 when accessing contraceptive services [75] and lack of safety travelling to health facilities in areas of armed conflicts [86] were further barriers to contraception. For resettled refugee women, barriers to contraception included religious beliefs, war trauma and sexual violence [87] but also having to travel a long distance for contraception services [97].

Being less informed about HIV-, and Zika-related adverse outcomes were further barriers to contraception [62,88–91]. For sex workers in areas of socio-political unrest such as the Colombian conflict, the costs of condoms and being able to charge more for condom-less sex were further barriers to use of contraception [68].

Closure of health providers, limited access and not having the ability to pay for contraceptive services were further barriers identified during disasters such as the COVID-19 pandemic and the Zika virus outbreak (e.g., in the Americas and Great Britain) [20,75,92–94]. Supply shortages due to pandemic-related closure of contraception manufacturers were also barriers to contraception [40,95].

During the COVID-19 pandemic, one in three women in the US reported trouble getting their usual birth control [75] due to cancellation or delay of appointments, and some groups (e.g., Black, Hispanic, LGBTQ women, lower-income women, immigrants) were more likely to experience barriers than other groups (e.g., White people, straight people, high-income women) [75,86,96].

In one study from the US, the majority of servicewomen reported that they were unable to obtain prescription oral contraceptive pills because of medical advice that contraception would not be needed during basic training [27]. Lack of availability of female providers, limit to contraception type and inadequate counselling and lack of confidentiality when obtaining contraception were identified as further potential barriers [25,27].

Impact of disasters on contraceptive behaviour. Two subthemes relating to the impact of disaster on contraceptive usage were identified: 'Demand and usage of contraception' and 'Contraceptive choice'.

Demand and usage of contraception. Nineteen articles [21,34,75,98–113], eleven of which were original research studies [21,34,99,101,103,106–110,113], considered how demand for contraception changed. There was conflicting evidence on whether the Zika outbreak led to increased demand for contraception [21,34,110]. Similarly, while some women reported that they wanted to delay childbearing during the COVID-19 pandemic and considered use of LARC, others did not change their views [75]. However, contraceptive usage during the ongoing COVID-19 pandemic appears to differ amongst married and cohabiting women and non-cohabiting and single women [113]. While married and cohabiting women appear to be more likely to continue their contraception, non-cohabiting and single women were more likely to discontinue contraception [113]. While some non-cohabiting and single women who stopped their contraception followed social distancing, others continued their sexual activity, infringed social distancing rules and had unplanned pregnancies [113].

Lack of data on the use of contraception amongst the population prior to armed conflicts makes it difficult to evaluate any change in demand, and data gaps on migration history or ethnicity also limit investigating the extent to which internal displacement affects demand [111].

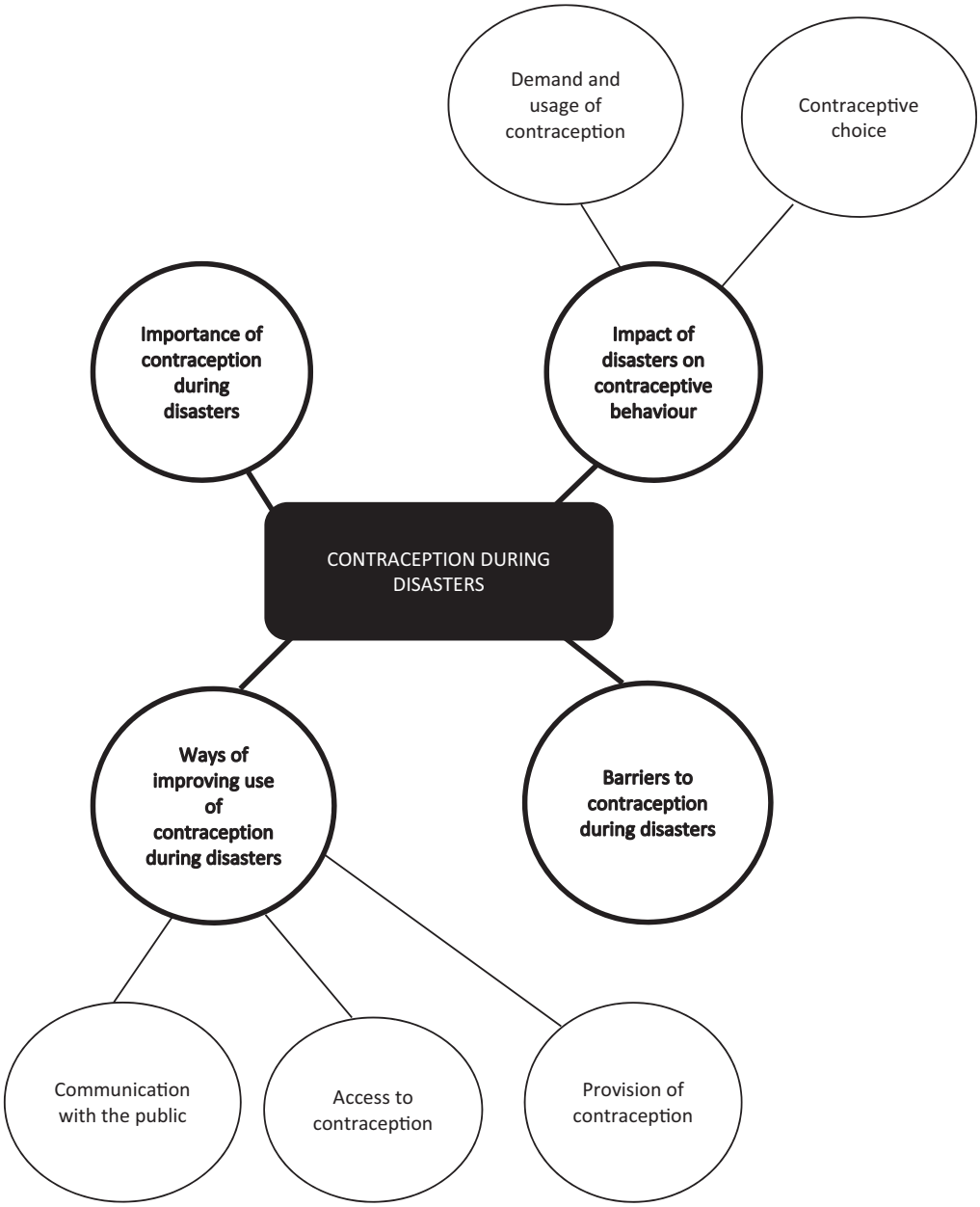

Figure 2. Overview of themes on contraception during disasters.

However, evidence suggests that use of contraception appeared to decline [111] in armed conflicts and after being displaced within the same country [111] or to another country [112].

Contraceptive choice. Twenty-four articles [24,27,39,40,57,58,67,113–126], sixteen of which were original research studies [24,58,66,67,75,113–116,118,120,122–127], gave insight into contraceptive choice. A number of commonly used hormonal contraceptives (e.g., ring, patch, emergency contraception, IUD) were reported to be absent from the military formulary in the US [27], limiting the choice of contraceptive options for servicewomen.

LARC. Women who followed stay-at home guidance or were self-isolating during the COVID-19 pandemic, considered longer-term supply of contraception or access to LARCs important [40,75]. More women in Puerto Rico chose the LARC method during the Zika virus outbreak compared to prior due to the Z-CAN programme to facilitate access to contraception [57,67,119], which also integrated a 'removal-inclusive' design (with access to removals well beyond the program period) to safeguard women's options in the longer term [66]. While LARC did not always achieve menstrual suppression, it made the bleeding lighter and more manageable [24]. Evidence suggests that LARCs are underutilised by servicewomen, particularly during deployment [125].

Hormonal contraception. While some evidence suggests that the use of hormonal contraception did not increase during the Zika outbreak, there is mixed evidence on whether hormonal contraception use increased during the COVID-19 pandemic [120,121]. There is evidence to suggest that the use of emergency contraception in clinics increased during the COVID-19 pandemic [39].

Servicewomen in some studies experienced difficulties in adherence to oral contraception (e.g., because of working and travelling in different time zones and long workdays) [24,27] and contraceptive injection in austere field environment (e.g., because of the need be stored at a certain temperature) [24]. Servicewomen require contraception that does not increase their risk of genitourinary tract

bacteria and yeast infections and does not increase the risk of venous thromboembolism (e.g., due to decreased mobility when travelling) [24].

Condoms. Some evidence suggests that condom use in Zika affected areas was relatively low [122,126] but in two studies including women, it was found that women who received counselling to use condoms to prevent Zika were more likely to use them [58,123].

Condom use increased at the beginning of the COVID-19 pandemic but then decreased [127]. No change in condom use in men who have sex with men during the COVID-19 pandemic was found [124].

Discussion

Findings and interpretation

The scoping review considered 110 articles, of which the majority focussed on the Zika virus outbreak and COVID-19. There is a lack of evidence on the impact of major natural events such as major earthquakes, floods and hurricanes, that cause significant destruction and displacement of people, on contraception. Research on the impact of disasters is largely limited to literature from the Americas.

The evidence included in this review confirmed that contraception is highly important during disasters. It is needed to reduce adverse health outcomes (e.g., Zika-related microcephaly births) and associated health care costs but also to ensure that contraceptive needs are met during disasters which may cause people to delay family planning due to financial or medical concerns. For deployed servicewomen contraception is particularly important for menstrual suppression.

The review found a range of actions relating to contraception that have been deployed to mitigate the effects of disasters. These include government efforts to communicate with the public (e.g., through health campaigns), increased access to contraception (e.g., through the distribution of condoms, removal of financial barriers) and transforming the delivery of contraception (e.g., through telehealth, drive-throughs, curb side administration).

Further, the review provided insights into the impact of recent disasters on contraceptive behaviour. There was mixed evidence on whether disasters increase the need for contraception, with differing changes in contraceptive behaviour depending on an individual's personal situation and relationship status. Lack of data on demand prior to the disaster was identified as a problem to evaluating changes in contraception usage.

The review highlighted various barriers to the availability of contraception during disasters. These included: closure of health providers; lack of safety travelling to health facilities; policies and institutional organisations; lack of ability to afford contraception; health providers' unwillingness to provide contraception; lack of knowledge about adverse outcomes of infectious diseases; and supply shortages. People from more disadvantaged socio-demographic and economic backgrounds (such as Black, Hispanic, LGBTQ women, lower-income women, immigrants) were shown to be more likely to experience barriers to contraception, suggesting widening inequalities in access to contraception during disasters.

The review highlighted that a lack of evidence on the use of contraception in times of disaster, and also in non-disaster periods, makes it difficult to assess how disasters affect the demand for and use of contraception. In the UK, the All-Party Parliamentary Group (APPG) on Sexual and Reproductive Health [128] has recognised that unless the uptake of contraception in different settings (including family planning clinics, general practices and pharmacies) is reported on a regular basis it is not possible to evaluate how uptake varies as a consequence of a disaster. Data on contraceptive use during disasters rarely distinguishes between new and continuing use of contraceptive services, making it difficult to determine whether both are affected by disasters in the same way or supported by the same strategies. Collecting such information is needed to better understand and plan for contraceptive needs at times of disaster.

The review identified that servicewomen deployed in areas of disaster had a high desire for menstrual suppression and for managing menstrual symptoms. Menstruating is likely to cause women to need to use the bathroom more and this is inconvenient for female health care staff working on COVID-19 wards as personal protective equipment has to be doffed and donned for each visit to the bathroom [129]. While no evidence on this exists to date, it is possible that menstrual suppression is also desirable among health care and other essential workers. Future work should consider whether health care staff, and particularly those working at the frontline of the current COVID-19 pandemic, have an interest in using contraception for menstrual suppression.

It is well recognised that there are inequalities in access to contraception [130–132], and these are likely to be exacerbated during disasters. There is evidence to suggest that removing barriers to cost, access and knowledge can contribute to removing disparities in access to contraception [133], and in line with this, our review found that women who received advice on the importance of using contraception to prevent adverse health outcomes were more likely to adhere to contraceptive usage.

The use of telehealth has increased substantially during the COVID-19 pandemic [134], including in contraception counselling. The scoping review highlighted advantages and disadvantages of using telehealth for contraception. While it may improve access for some, those without internet or telephone may be excluded and it may become harder to identify people at risk of abuse and neglect [135].

Strengths and weaknesses

A strength of our review is that key research gaps were identified. For example, we found that research on contraceptive uptake before, during and after disasters is needed to understand changes in contraceptive uptake. Further, more research outside the Americas and research on disasters other than COVID-19 and Zika are needed to gain a better understanding on how different types of disasters impact contraception provision and access.

A limitation is that the review was restricted to evidence from OECD member countries, and hence the findings may be less relevant to lower-and middle-income countries.

Even within OECD member countries, health care systems differ and hence the findings are unlikely to be relevant to all settings. However, our scoping review provides a comprehensive overview of the available evidence on the impact of disasters on contraception in OECD member countries and identified factors that can contribute and inhibit access to contraception during disasters. Hence, the information provided in this review provides valuable information for those delivering and planning contraceptive services. However, it is important that future research exploring the impact of disasters on contraception in middle-and low-income countries is conducted, particularly since those countries may be more be negatively impacted by disasters. Further, researchers should explore the impact of specific epidemic and pandemics (e.g., Zika or COVID-19) on contraception.

Conclusions

This scoping review is the first to synthesise evidence on the impact of disasters on the provision and use of contraception. The evidence reviewed highlights the importance of research and policy focussing on removing barriers to contraception at times of extreme social disruption, addressing inequalities in contraceptive access and on providing contraception choice. Side effects which may be viewed as beneficial, such as suppression of menstruation, should be highlighted to service users, particularly those in frontline roles. Telehealth could be of benefit, but its limitations acknowledged in order not to exacerbate the inequalities. To increase the uptake and sustained use of contraception during disasters, we recommend intensification of efforts to increase information on the availability of contraception, particularly where it is free of cost to the service user. Finally, the effect of lockdown rules, such as those during COVID-19, being tightened and released may affect the need and access to contraception, but more data on the use of contraception is needed to fully understand how contraceptive behaviour changes during and after such changes.

Author contributions

SH, JD, SS and DB had the idea for this scoping review. BF compiled the literature search in collaboration with SH, JG and SJ. BF conducted the literature search. BF, SH and JG screened the articles for their titles and abstracts and their full texts. BF extracted all data from the articles. JG conducted the analysis and wrote the discussion in collaboration with SH. JG led the write up of the scoping review. JD, DB, SS and BF reviewed the draft and provided feedback for improvement.

Disclosure statement

The authors report not conflict of interest. The authors alone are responsible for the content and the writing of the paper.

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