General practitioner disaster support for pregnant women, new mothers, infants and young children: Findings from the Babies and Young Children in the Black Summer (BiBS) study

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Background and objective
Pregnant women, new mothers, infants and young children are vulnerable during the disasters that commonly impact Australia. The aim of this paper is to explore the challenges faced by these groups during and after the 2019–20 Black Summer bushfires and identify how general practitioners (GPs) can provide support.

Methods
Caregivers of children aged 0–4 years who experienced the 2019–20 Black Summer bushfires, and emergency responders who had supported families during this and other emergencies, were surveyed and interviewed.

Results
A total of 256 parents and 63 emergency responders were surveyed or interviewed. Disaster challenges faced by pregnant women and families with infants and young children were identified related to preparedness, response and recovery, as well as specific health and medical issues.

Discussion
GPs can support the health and wellbeing of pregnant women and families with young children before, during and after disasters in many ways. Greater integration of GPs into emergency planning is needed.

THE UNPRECEDENTED EMERGENCY of the 2019–20 Australian Black Summer bushfires (hereafter bushfires) impacted communities in all states and territories.[1] However, not all people are equally vulnerable in emergencies. Pregnant women face heightened risk due to physical demands and limitations of pregnancy, susceptibility to smoke and infections, and need for health support.[2,3] Similarly, infants and young children (aged 0–4 years) experience increased vulnerability due to their stage of physical and emotional development, specific nutritional needs, proneness to infection and dehydration, and dependence on others.[4,5] Those caring for infants and young children are made vulnerable as caregiving itself impacts the ability to avoid disasters and obtain support. Additionally, mothers might be newly postpartum or breastfeeding. Adverse environmental exposures during pregnancy and early childhood can have long-lasting effects on maternal and child health, increasing the risks of chronic diseases, pregnancy complications, maternal mental health conditions, as well as anxiety in children.[6,7]

The Royal Australian College of General Practitioners advocates for general practitioners (GPs) to play a role in disasters.[8] In a qualitative study from Australia and New Zealand, GPs described their spontaneous response and adaptation of expertise for disaster healthcare and the associated challenges, both personal and professional, which are consistent across disaster types.[9] Australian GPs felt inadequately integrated and valued in disaster responses.[9] This study emphasised the necessity for improved GP role definition, integration and support within disaster management systems.

The research presented in this paper is part of the Babies and Young Children in the Black Summer (BiBS) study, which is part of the Australian Breastfeeding Association's (ABA) Community Protection for Infants and Young Children in Bushfire Emergencies project. It aims to improve understanding of challenges faced by pregnant women and caregivers of infants and young children in disasters, and the roles GPs can play in supporting these groups. In this paper, the words 'women', 'mother/s' and 'father' are used in their sexed meaning to refer to adult female people, female parent/s and male parents, respectively, for clarity and due to the sexed nature of pregnancy, birth, breastfeeding and infant care.[10,11]

Methods

We used a mixed methods approach involving a survey with closed and open-ended questions and interviews. Caregivers of children aged 0–48 months impacted by the 2019–20 Black Summer bushfires, and emergency responders who had supported families during or after these bushfires, were eligible for the survey. The survey was open to participants from anywhere in Australia, and the aim was to gather a breadth of information from a diverse and large number of individuals. Caregivers of children aged 0–48 months who had experienced the bushfires in Eurobodalla Shire on the New South Wales (NSW) south coast or surrounds were interviewed to add an in-depth understanding of parent and child emergency experiences within one community. Finally, emergency responders who had supported families in any Australian disaster were interviewed to gain an understanding of the breadth of emergency experiences over time, emergency type and geography.

The survey was on the online platform Qualtrics® (Qualtrics, Seattle, WA, USA). Survey participants were recruited through advertising on social media. Parent interviewees were recruited via social media, local media, community fliers, snowball sampling and purposeful sampling, and were interviewed in-person. Emergency responders who completed the survey were given the option to be interviewed, and also recruited by snowball and purposeful sampling and were interviewed by telephone, Zoom® (Zoom Video Communications, San Jose, CA, USA) or in-person. All interviews followed a semi-structured interview guide. Data were collected from August 2022 to February 2023, with the number of interviews undertaken determined by the time frame available for the study.

Surveys and interviews explored parents' experiences of the 2019–20 Black Summer bushfires. Parents were asked about emergency preparedness, and their evacuation and caregiving experiences during and after these bushfires. Emergency responders were asked to describe how they had supported families with very young children and what they observed as having helped or not. Qualitative survey and interview data were uploaded to NVivo v14® (Lumivero, Denver, CO, USA) and analysed alongside each other using a simple conventional content analysis by both researchers[12] to identify health and wellbeing-related issues. Analysis was informed by the experience of the researchers, one of whom is a GP who lived and worked in Eurobodalla Shire during and after the 2019–20 Black Summer bushfires and the other a long-time researcher on infant and young child feeding in emergencies.

Ethical approval was granted by the Western Sydney University Human Research Ethics Committee (approval H15019).

Results

Two hundred and thirty-three parents and caregivers (overwhelmingly mothers) participated in the survey, and 22 mothers and one father were interviewed. Survey respondents were mostly from NSW (77%) and almost half of NSW participants were from Eurobodalla Shire. Thirty-seven women were pregnant at the time of the bushfires. One hundred and ninety-nine parents provided detail on the number and ages of their children (Table 1). Sixty-three emergency responders were surveyed or interviewed, including four GPs.

Experiences related to health and wellbeing of pregnant women, infants and young children, and their mothers and other caregivers were identified at the emergency preparedness, response and recovery phases. In addition, specific health issues were identified.

Emergency preparedness

Survey data showed parents were not well prepared for the bushfires; 65% did not have an emergency plan and only one-quarter packed an evacuation kit containing items for their children before the bushfire season. Over one-third of parents evacuated later than desired at the first or only time they evacuated, with 38% saying that needing to pack items for their child delayed evacuation. In surveys and interviews, parents and emergency responders reported evacuations without child supplies including medicines, infant formula, solid food, water, sanitation items, clothes and bedding.

A pregnant mother of two, aged one and five years, described her first evacuation thus, 'It was just so quick … I forgot the bottle.' In a later evacuation, a different essential item was missed, 'We had no water … that was left (behind).' Breastfeeding women were relieved they could safely feed their infants and did not need to pack feeding items. A mother of a baby aged four months explained, 'All I needed were my breasts'. Some heavily pregnant and newly postpartum women struggled during evacuations, especially when they were evacuated on their own with small children.

Emergency response

Inadequacies in emergency response were evident in survey and interview data. Emergency responders reported evacuation centres were often highly unsuitable for infants and young children, lacking resources for childcare, being physically unsafe and dangerous from a hygiene and child protection standpoint. As one GP expressed, 'In terms of child safety, the (evacuation centre) was full of dark spaces, poorly lit with totally inadequate toileting facilities … There's nothing about it that is safe'. Mothers were often on their own in evacuation centres and too overwhelmed to seek assistance or did not know who to ask. This contributed to unsafe practices such as washing feeding bottles in toilet sinks. One emergency responder described, 'I went into the toilets … and here's a lady trying to wash baby's bottles so she can make up some formula.' In one case, a sole mother, wanting to protect her infant from strangers, hid them under a blanket while she went for a shower, risking suffocation. In another case, an infant

Table 1. Ages of children whose parents participated in the Babies and Young Children in the Black Summer study

Age of children	N=404
0–5 months	41
6–11 months	37
12–23 months	58
24–47 months	124
4–6 years	87
7–10 years	35
11+ years	22

Data are presented as n.

experiencing feeding difficulties required hospital treatment for dehydration after 12 hours in an evacuation centre.

The stress and difficulty placed on women in evacuation centres could be immense. Multiple mothers described staying awake all night to ensure their children's safety from animals and strangers. A newly postpartum mother sat on the ground in the middle of a crowded evacuation centre and very publicly expressed breastmilk. Parents and emergency responders repeatedly noted a need for a separate and supported area for pregnant women and families with infants and young children in evacuation centres. One emergency responder said, 'We need to be able to provide an area where parents can feed their babies. We need to provide an area that's clean and safe.'

Some GPs volunteered in evacuation centres and the contribution made was significant. One GP/obstetrician described giving support to pregnant women: 'We had a couple of pregnant women that were at term ... we rang the hospital and said, "We've got them here."... When the roads opened, we got them to go closer to (the hospital) ... they had a lot of psychological distress, there was a lot of comforting of those women.' However, other GPs who offered assistance were turned away. As one emergency responder described, 'They were ordered not to treat patients. It was terrible.' A number of GPs made their surgeries available as shelter for vulnerable evacuees. One GP shared, 'We rescued a few families with little babies, and they slept at the surgery.'

Immediate aftermath and recovery

In the immediate aftermath of the Black Summer bushfires, interrupted access to healthcare, food, electricity and water was challenging for pregnant women and caregivers of infants and young children. Those formula feeding had difficulties related to accessing infant formula (particularly specialty formula) as well resources for heating water and washing. One mother with an infant aged less than one month described the ramifications of a lack of washing resources, 'I had absolutely no way to ensure the bottles were cleaned as we only had a bit of water and paper towel to wipe them out with. The bottles did not have any contact with detergent on over six days.'

Breastfeeding women experienced non-emergency-related feeding issues, but also faced challenges connected to the emergency. One farmer mother with a baby aged three months described how she was 'Still having attachment issues (when the fires came), which was leading to a reduction in supply ... then with the adrenalin, huge physical workload and lack of hydration my milk was drying up.' She was among several women who ceased breastfeeding earlier than planned. Disruptions in accessing healthcare, including antenatal and postnatal care and childhood vaccinations were reported, as well as problems obtaining medications.

Survey data indicated mothers of infants and young children experienced significant distress in the months following the bushfires, including high rates of stress, sadness, anxiety and overwhelm. Some also struggled to be patient with their children (Table 2). Emergency responders also noted high distress levels. One GP described, 'A lot of presentations just of the parents being really distressed.' However, specific support for pregnant women and infants and very young children appeared largely absent in the recovery period. Schools and some early childhood settings provided a conduit for assistance, but families whose children were too young to be in institutional care were overlooked. Women reported feeling isolated and wanting support, including opportunity to be with other mothers. As one mother of two children, aged four months and two years, shared, 'I had no one around. There were many days where my husband was doing overtime to support people that needed help but then couldn't be there for us.'

Mothers described the difficulty of needing to protect and care for children while suffering themselves. As one mother

Table 2. Frequency of feelings and experiences of mothers overall and of those in the Eurobodalla Shire in the 3 months and 3–6 months after the 2019–20 Black Summer bushfires

Feelings and experiences	Overall (minus Eurobodalla Shire)		Eurobodalla Shire (only)	
	First 3 months after the bushfires (n=92)	3–6 months after the bushfires (n=92)	First 3 months after the bushfires (n=45)	3–6 months after the bushfires (n=45)
More stressed	67	48	78	47
More difficult to be patient with children	22	14	40	22
Struggled with anxiety	50	40	65	47
Struggled with sadness	37	28	40	31
Felt hopeless	22	17	16	18
Felt scared about the future	35	24	33	24
Felt overwhelmed much of the time	33	20	33	27

Data are presented as percentages.

of a child aged three years described, 'That's what I think was the most difficult thing, not being able to have any space to process one's own stuff … The unrelentingness of parenting is exacerbated in an emergency, constantly having to self-regulate for the children's sake and not being able to have any space to do your own thing.' One-quarter (36/140) of women accessed mental health support after the bushfires. Approximately half (53/104) of those who did not seek support felt they did not need mental health assistance. The remaining women did not seek mental health support for a variety of reasons, including prioritising others, not having time, being too overwhelmed or childcare issues (Table 3).

Of those who did access mental health support, one-third did so with their GP. One mother of children aged one year and four years praised her GP's proactive assistance; 'I went to my GP and I was in total burnout … And he just said to me, "What was your experience in the fire?" And I was like, "What? That's not relevant."… And I just started spraying tears.' Another mother with children aged four months and two years felt proactive questioning by her GP would have been beneficial, 'I didn't know how much the fires affected me after until later. I had postnatal depression; I think I probably had PTSD as well … Doing the assessments on you before you even flag it yourself would've been, I think, a good one in getting the help a bit sooner.'

Many survey participants noted behaviour changes in their infants and young children during and in the months after the bushfires. Parents reported their youngest child wanted more closeness and attention from them, were waking more overnight and were more unhappy and irritable (Table 4). Early childhood educators reported unusually high levels of behavioural difficulties in preschool aged children who were infants or young toddlers at the time of the bushfires.

Health challenges

Survey and interview data revealed health challenges resulting from or worsened by the bushfires, falling into three main categories: environmental contamination; infrastructure and healthcare disruption; and aggravated health conditions, which are detailed in Table 5.

Discussion

This research identified health challenges faced by pregnant women and families with infants and young children during disaster preparedness, response and recovery. Each stage offers intervention points for GPs to mitigate risks and protect health and wellbeing.

Emergency preparedness can begin antenatally, with GPs encouraging parents to create emergency plans, consider early evacuation to a family or friend's home rather than an evacuation centre, and prepare evacuation kits. GPs can assist parents to take into account medical conditions and needs when packing including items related to conditions like diabetes and asthma management, and specialty feeding requirements. Resources on

Table 3. Frequency of reasons why women did not seek mental health support after the Black Summer bushfires

Reasons why women did not seek mental health support	Frequency (n=51)
Thought other people needed it more	28
Did not have time to access	20
Was too overwhelmed to access	13
Too difficult to access	14
Did not know of mental health services	12
Too expensive	8
Could not get childcare	7
Was too embarrassed	1
Was in a domestically violent relationship	1

Data are presented as n.

Table 4. Behaviour changes in youngest children observed by parents during and 1 month after the Black Summer bushfires

Behaviour change	Overall (minus Eurobodalla Shire) (n=103)	Eurobodalla Shire (only) (n=53)
Not wanting to be put down	23	38
Only wanting me to hold them	18	28
Wanting more of my attention	37	43
Not wanting to be separated from their parent	38	43
Waking more frequently overnight	36	40
Being more unhappy	11	9
Being more irritable	25	28
Crying more	12	19
Fighting more with siblings	9	8
No behavioural changes noticed	35	34

Data are presented as percentages.

Table 5. Health challenges resulting from or exacerbated by the Black Summer bushfires

Categories	Impact	Health consequence	Interventions
Environmental contamination			
Air contamination	Exposure to bushfire smoke; prolonged indoor isolation	Eye/throat irritation; respiratory issues; exacerbation of asthma; reduced physical/mental health	Education on smoke avoidance; fitted masks; high efficiency particulate air (HEPA) filters
Water contamination	Sewage-contaminated water; ash-contaminated water	Contaminated water consumption/ exposure	Water purification education; safe feeding practices; bottled water access; infant feeding resources
Surface contamination	Ash, asbestos, other pollutants	Respiratory issues; eye/skin irritation; potential long-term health effects	Family-specific health risk education; safe play practices
Infrastructure and healthcare disruption			
Access to food and nutrition	Limited food access; food spoilage	Malnutrition; exacerbated health conditions; gastrointestinal issues	Access to healthy foods; nutritional supplements
Power network, telecommunications disruption, road closures	Disruption of medical facilities/ equipment, phone/internet, road access	Delayed treatments; compromised care; hot/smoky indoor environments; evacuation and coordination difficulties	Battery-operated equipment; back-up power supply; power outage planning; alternative communication and coordination channels; back-up systems
General access issues	Delayed/missed treatments; difficult provider access	Delayed care; compromised outcomes	Emergency planning; back-up records; telehealth; mobile clinics
Medications access	Difficulty accessing essential medications	Exacerbated conditions; increased health risks	Medication stockpiling; emergency kits; telehealth; medication delivery
Family support services access	Difficulty accessing essential services	Increased stress/mental health challenges; exacerbated family issues	Alternative support options; virtual counselling; emergency planning; community programs

Table continued on the next page

emergency planning, evacuation kit lists and infant feeding in emergencies are available.[13] Discussing breastfeeding as part of emergency preparedness can help women incorporate this into their infant feeding decisions.[14] Providing breastfeeding support will enhance individual and community resilience. GPs could also consider adding pregnant women, new mothers and caregivers of infants and young children to the vulnerable persons register, especially those with high-risk pregnancies, mobility or transport issues or domestic violence concerns.

Greater integration of GPs into disaster management will increase their involvement in emergency planning and response.[15] GPs can promote the inclusion of the needs of pregnant women and families with infants and young children in local emergency plans. This might include advocating for evacuation centres to have a separate and supported space for these groups. It might also include advocating for 'mother–baby areas' (MBAs), which provide a disaster recovery space where women can rest and connect with other mothers, receive support for their caregiving, mental and physical health, and referral to support.[16]

GPs should ensure their practices have emergency plans, including regarding continuity of medical care during disasters.[9] Where appropriate, GPs could make their offices available as an evacuation venue for vulnerable people including pregnant women and those with infants and young children. They might also consider undertaking emergency training and/or being added to evacuation centre volunteer registers, which are facilitated by some Primary Health Networks. In evacuation centres, GPs can advocate for pregnant women, infants and young children and provide pregnancy support, proactive assistance with infant feeding (including breastfeeding support and ensuring that formula feeding caregivers have access to needed resources) as well as medical care.

In the aftermath of disasters, initial consults with pregnant women and parents of infants and young children should include asking whether they have necessary resources and, where needed, provide referral for support including food and formula feeding supplies. It is important for GPs to be aware it is common for women to experience breastfeeding difficulties and lack breastfeeding self-efficacy in emergencies.[17] Proactively enquiring about feeding concerns, providing assistance and referral if needed to local lactation services or the ABA helpline is recommended.

Our study identified significant mental strain experienced by mothers following the bushfires. Cherbuin et al investigated the impact of the 2019–20 Australian bushfires

Table 5. Health challenges resulting from or exacerbated by the Black Summer bushfires (cont'd)

Categories	Impact	Health consequence	Interventions
Aggravated health conditions			
Asthma	Smoke exposure; limited medicine access	Respiratory distress; hospitalisations; increased interventions	Asthma action plans; medication stockpiling; education campaigns; clinics; telehealth
Gastroenteritis	Poor hygiene; food/water contamination	Gastrointestinal illnesses; dehydration; hospital admissions	Improve hygiene facilities; clean water/food; promote sanitation
Injury	Unsafe evacuation; inadequate facilities	Traumatic injuries; fractures; lacerations; increased emergency room visits	Safe evacuation planning; secure facilities; injury prevention education
Pregnancy complications	Smoke, heat, stress exposure	Premature births; placental problems; maternal/fetal health risks	Prenatal education; regular check-ups; early evacuation
Breastfeeding difficulties	Disruption of routines; stressful environments	Infant dehydration; inadequate nutrition; maternal stress/anxiety	Breastfeeding support; private spaces; priority appointments; support groups
Formula feeding issues	Power disruptions; supply chain issues; access issues	Illness from non-specialty formula; parental stress; infant dehydration	Advise parents of infants on specialty formula to keep an extra tin; provide referrals for formula resources
Maternal health issues	Stress, trauma, disruption	Worsened mental/physical health; increased service demand; maternal exhaustion	Prioritised resources; psychological first aid; mental health education; support services
Child special needs	Increased behavioural issues	Worsened symptoms; family challenges	Individualised emergency plans; specialised support/resources; behavioural strategies
Child caregiving impairment	Impaired child–parent attachment	Emotional/developmental challenges; risk of neglect	Parenting support/education; stress management; post disaster child–parent bonding resources, mother–baby areas
Child behavioural concerns	Emotional dysregulation; developmental regression	Emotional/developmental challenges; increased mental health service demand	Behavioural support/education; stress management; emotional wellbeing resources
Domestic/sexual violence/ child protection	Increased violence including sexual assault and protection issues due to stress, close quarters	Physical injuries; psychological trauma; increased service demand	Safe spaces; increased security; awareness/education; victim support resources

Note: This not an exhaustive list. Some of these areas overlap in categories.

Information in the 'Impact' column is drawn entirely from study data; information in the 'Health consequence' column is a mix of study data and extrapolation; recommendations in the 'Intervention' column are based on the authors' suggestions.

and the subsequent COVID-19 pandemic on the mental health of pregnant women and new mothers.[6] They found that those with high exposure to bushfires and smoke were significantly more likely to experience moderate to severe depression and/or anxiety. Both pieces of research underscore the need for targeted mental health support during and after disasters, including a role for GPs in proactive early mental health screening. Support might also include referrals to services that reduce parental stress, such as individual case management and other recovery supports like MBAs (where available). As noted in previous research, GPs should be aware that longer appointments might be required to allow parents to discuss their experiences and concerns, and have flexibility to provide care to those whose normal GP is not available because of the disaster.[9]

Child behavioural shifts reported in this study have been observed in other emergencies,[18] highlighting the need for GPs to assist parents in understanding and addressing behavioural concerns in their children. Often, children's reactions are linked to parental stress, so providing psychological and other supports to parents can alleviate their child's distress. However, for some children, symptoms might progress or fail to resolve over time, in which case awareness of referral pathways is beneficial. For instance, the non-governmental organisation, Royal Far West, has programs in NSW and Queensland to support children and parents following emergencies.

A recent independent evaluation of their work has shown benefits to participating children's communication, emotional management, peer connections and coping abilities.[19] Additional resources such as the Birdie's Tree book series, helps young children understand emergencies, and the Tiny Adventures activities, developed to encourage parent–child connection after the 2011 Christchurch earthquake.[20] There is, however, a need for more support for those caring for infants and young children following disasters.[21]

The vulnerability of women, particularly pregnant women, new mothers and their young children to disasters is profound and multifaceted, requiring GPs to consider the breadth of disaster repercussions on specific health issues. This might involve thorough enquiries into environmental exposures, medication adherence, disruptions to daily routines, and changes in diet and physical activity. As found in this and other research,[9] a range of presentations post-disaster might stem from inter-connected factors. For example, prolonged avoidance of outdoors to avoid smoke might increase risk of vitamin D deficiency in pregnancy, and dietary shifts toward packaged foods might lead to nutritional deficiencies and digestive disorders. GPs can also disseminate information on how parents can safeguard themselves and their children. Health consequences and intervention points for GPs in relation to different disaster impacts are outlined in Table 5.

Limitations

This research focussed on a bushfire emergency. It would be expected that different health impacts occur in other emergency types. The survey was lengthy and would have presented a barrier to participation for those with low literacy. A large proportion of study participants that came from Eurobodalla Shire might also be considered a limitation.

Conclusion

GPs can play a critical role in disaster preparedness, response and recovery for pregnant women, infants and young children. They can play a significant role not only in the immediate medical response, but also in fostering long-term resilience and recovery for families and communities. Greater integration of GPs into emergency planning is required.

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