The Routledge Handbook of Green Social Work

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The challenge of maintaining continuity in health and social care during extreme weather events

Publication details


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Published online on: 06 Apr 2018

How to cite :- Sarah Curtis, Lena Dominelli, Katie J. Oven, Jonathan Wistow. 06 Apr 2018, The challenge of maintaining continuity in health and social care during extreme weather events from: The Routledge Handbook of Green Social Work Routledge

Accessed on: 26 Jul 2023


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The challenge of maintaining continuity in health and social care during extreme weather events

Cross-sectoral and transdisciplinary approaches

Sarah Curtis, Lena Dominelli, Katie J. Oven and Jonathan Wistow

Introduction

Global climate change presents the crucial and growing challenge of how to ensure continuity of health and social care to meet the specific needs of populations requiring access to services on an ongoing basis due to chronic ill health, disability or social disadvantage. We specifically consider extreme weather events producing conditions under which health and social care systems face special challenges in maintaining continuity of care. The discussion in this chapter draws especially on illustrations from England, an example of a country with a well-developed health and social care system and an ageing population, where governmental agencies and other partners, including academic researchers, are working together to address these issues.

In the first part of this chapter we set out the key elements of the complex health and social care system considered here. In the second part we introduce a transdisciplinary approach to address these challenges developed in a research project in England focused on ‘Built Infrastructure for Older People’s Care in Conditions of Climate Change’, and highlight this topic as one for green social workers to engage with fully within a transdisciplinary framework.

The complex problem of older people’s health and social care during extreme weather events

The issue considered here has a number of dimensions which include: demographic trends producing relatively rapid growth of older populations; growing complexity of health and social care systems and care needs; and increasing risk of extreme weather events, associated with climate change. We argue that strategies to enhance preparedness and resilience to extreme...
weather require enhanced collaboration and integration across professional sectors and diverse knowledge bases. We therefore focus on the arguments for transdisciplinary and cross-sectoral approaches, an approach central to green social workers (Dominelli, 2012).

The increasing demand for continuing care among older populations

Older people are a diverse group and should not be considered as universally ‘vulnerable’, since many of them are in relatively robust health and able to draw on considerable reserves of accumulated social and economic capital, and knowledge and skills acquired over a lifetime. However, a relatively large proportion of older people, especially those in the oldest age groups are especially likely to be impacted by extreme weather events in ways which affect their physical and mental health. This is partly because, compared with younger adults, older people are more likely to be physically and mentally frail, due to existing health problems that are exacerbated by extreme weather. Furthermore, a relatively large proportion of this age group needs to use health and social care services on an ongoing basis arising from chronic and sometimes quite complicated health problems, so they are among the groups that will be most severely affected if health and social care delivery is disrupted due to extreme weather.

This demographic group is growing as a proportion of the total population globally, which is why, for example, the Sendai Framework for Disaster Risk Reduction (United Nations, 2015:10) refers to ‘demographic change’ as a ‘compounding factor’ which is contributing to vulnerability to disasters. In Europe, a region where the ‘demographic transition’ is relatively advanced, 27 per cent of the population is expected to be aged 65 years or over by 2050 (WHO, 2012). The oldest age groups are expanding particularly rapidly. For example, in England, population projections suggest that the size of the population aged 85 years and over will have increased from 2.2 per cent to 4.6 per cent between 2008 and 2033 (Oven et al., 2012). In other world regions, while the population profile at present includes a smaller proportion in older groups, the demographic trends are generally shifting towards significant ageing. At the global scale, it is anticipated that there will be increasing demand for health and social care services for older people, and that a growing number of people will be dependent on continuous care. This makes it even more important to ensure that, looking ahead, the services required will be available.

Growing complexity of health and social services for service users requiring continuous care and support

In many countries internationally, health and social services for those needing regular and frequent access to care have developed into complex systems involving many different partners and a variety of different types of carers, infrastructures and resources. This is particularly evident in high-income countries that have been able to invest in health and social care over an extended period. Health and social care systems comprise crucial built, institutional and social infrastructures which are all necessary to ensure continuity of care. The World Health Organization (WHO) states that:

A good health system delivers quality services to all people, when and where they need them. The exact configuration of services varies from country to country, but in all cases requires a robust financing mechanism; a well-trained and adequately paid workforce; reliable information on which to base decisions and policies; well-maintained facilities and logistics to deliver quality medicines and technologies.

(WHO, 2017)
Thus, it is understood that health systems extend beyond the medical staff and equipment necessary to provide clinical treatment, social care and include a range of organisational and policy-making functions. Understanding this complexity is essential for adult social care workers adopting a green perspective. The IPCC (2014: 20) has argued that to strengthen health systems internationally ‘a broad partnership of stakeholders can deliver a richer understanding’ of the ways that systems will respond to change, ‘what synergies can be harnessed and what negative emergent behaviour should be mitigated’. This is particularly relevant for development of ‘green’ (sustainable) health and social care systems that take action to prepare effectively to reduce disruption during extreme and potentially disruptive events. Research on green social work (Dominelli, 2012) can help to inform this agenda by demonstrating how social care can be made more responsive to social stressors arising from changing environmental conditions and pressures, and make societies more resilient. Green practices also place emphasis on adaptation and evolution in ways that help to mitigate the challenges faced due to environmental change.

Climate change and the growing challenges of maintaining continuity of care during extreme weather events

Assessments including the report published in 2014 by the Intergovernmental Panel on Climate Change Assessment (IPCC, 2014) have identified a range of risks associated with climate change that are likely to impact on human health over the 21st century. The main impacts are expected to be through exacerbation of existing health problems since, for example, those with a range of health problems including cardiovascular and respiratory illnesses are especially vulnerable to increasing risks of extreme heat and poor air quality. These are points for green social workers to consider when assessing vulnerability.

Globally there is also a growing risk of injury due to more frequent storms, floods and tidal surges, wildfires, and geophysical disasters such as landslides precipitated by changing meteorological conditions. There is also concern about increased vulnerability to vector-borne diseases, as environmental conditions become more suitable for some insects and animals carrying diseases, while infectious disease risks are likely to increase if extreme weather events damage infrastructures including water and sewerage systems. Mental, as well as physical, health is known to be impacted by extreme weather events such as major floods, due to the trauma and loss that is often experienced during the event and also post-traumatic stress and the long-term impacts of extreme events on families and livelihoods. Problems arising from disaster-related stress and trauma are also associated with the broader impacts of extreme weather associated with climate change, such as drought-induced water shortages and poor quality of water supply; challenges to agricultural production; and threats to economic systems and ecosystems that affect people’s standards of living. As a consequence of periods of extreme weather, food shortages are expected to contribute to health problems due to inadequate nutrition in some regions of the world. These problems are related to social and economic vulnerabilities as well as physical hazards, and have implications for social care systems and medical care, because these risks are most elevated for the poorest populations that are already disadvantaged by relatively poor health and are likely to require social and welfare support.

There are particular pressures on both health and social care systems that arise from increased demand during extreme weather events. The challenge of meeting these exceptional demands for care is further heightened by the risks of disruption to the various infrastructures upon which these services depend, such as damage to built infrastructure and supply systems and lack of access to professional or informal care givers. The Sendai Framework for Disaster Risk Reduction
Curtis et al. (United Nations, 2015: 12) emphasises that it is important to ‘substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health . . . including through developing their resilience by 2030’.

In the UK, the latest national climate change risk assessment by the HM Government Committee on Climate Change (2017) has evaluated the risks for health and health systems posed by the impacts of climate change on health. Compared with many parts of the world, the UK has a relatively mild climate. However, this means that the national population and care systems are not well adapted to ‘extreme’ events that might seem less serious in other countries with a more variable climatic regime. For example, temperatures of 25–32°C trigger heat alerts in the UK health system, although these might seem more ‘normal’ summer temperatures in other countries. Although events such as extreme drought and hurricanes are not considered likely events in the UK, the Climate Change Risk Assessment (CCRA) indicates concern about the increasing risk of heat waves and flooding and recognises that very cold weather involving prolonged snow and ice will continue to occur (although cold weather events are projected to occur less often over the long term). It is acknowledged that planning for these events is made more difficult because the changing frequency of extreme weather events over the long term is more difficult to predict than trends in average climatic trends, so that there is a good deal of uncertainty involved (Owen et al., 2012). The CCRA indicates the need to improve nationwide measures to ensure that there is ongoing preparedness for such events in various sectors, including health and social care. As one of the priorities for future action it was noted that it will be necessary to ensure that guidelines and advice on preparedness issued by national agencies are appropriately applied at the local level.

Transdisciplinary and cross-sectoral planning: examples from applied research in England

Given the growing complexity of health and social services and the growing challenges presented by climate change, health and social care services are among those essential systems which have to adapt in order to be resilient to changing global conditions, and it has been argued that adaptation will require ‘transformative’ change (WHO, 2016). For example, it will be necessary to introduce new methods of working in order to become better adapted to environmental changes including extreme weather events (United Nations, 2015; WHO, 2017). Significant progress has been made in the National Health Service (NHS) for England through the development of a Sustainable Development Unit (SDU) (www.sduhealth.org.uk/) which emphasises the importance of learning from previous extreme events and the need to ‘reset’ systems to perform better under future conditions (Haines, 2012; Pencheon, 2013). Advice from the Sustainable Development Unit also recognises that a system as extensive and complex as the NHS is itself one of the contributors to environmental and climate change because its operations involve significant energy use, emission of various waste products and it occupies large areas of land. This means that, in addition to adapting to the ‘external’ impacts of climate change, ‘internal’ adjustments need to be made to ensure that ‘green’ practices will be introduced more extensively into routine activity of the health sector. Green social workers can also assist in the identification and implementation of such practices (Dominelli, 2012).

In addition to these reports from central government via the CCRA and SDU, the national government in England also issues other detailed guidance and recommendations for local agencies regarding actions to be taken to prepare for specific events such as heat waves, cold weather and floods, which are the types of extreme weather events most likely to occur in the
UK. These have been published by Public Health England (PHE) (PHE, 2015a, PHE, 2015b) and by the Department of Environment, Food and Rural Affairs (Defra) (Defra, 2014).

Thus, it is evident that a diverse array of national governmental agencies in England are involved in the development of extreme weather planning for the health sector, not all of which are directly positioned within the NHS. A considerable breadth of different sorts of professional and technical expertise are called into play, including not only fields of medical and social care, but also aspects of environmental science and management, epidemiology and engineering. The other countries that make up the United Kingdom (UK) also have similar planning mechanisms, although these are not discussed in detail in this chapter.

The system for extreme weather planning is further complicated by the need for vertical allocation of roles and responsibilities between national and local agencies. NHS England has published an *Emergency Preparedness, Resilience and Response Framework* (England, 2016) which sets out how responsibility for preparedness and response during emergencies, including extreme weather events, is distributed between national, regional and local agencies in the health and social care sector. Except in very extreme conditions affecting extensive areas of England, this responsibility rests at the more local level. It is, therefore, important that key actors at the local level are prepared and positioned to act during an emergency. Service coordination is an additional consideration in which green social workers have extensive expertise.

Local preparedness planning also involves engagement of a wide range of partners. In recent decades, England has moved towards a ‘market model’ for health and social care, through which local public sector commissioning groups are charged with the expenditure of government funds that are used to contract with a wider range of partners in the independent, as well as the state sectors, in order to provide services to the local population. In principle (though in practice this may be difficult to achieve) the commissioning process should take into account the extent to which service providers have in place measures that will make them resilient to extreme weather (Carr-West et al., 2011; Evans, 2011). The system of service commissioning at the local level involves partners in the NHS (administrative organisations), local government organisations (locally elected bodies) and adult social care service providers. Most recently, there have been moves towards greater devolution of responsibility for healthcare management through the establishment of Accountable Care Systems (ACS) involving locally devolved powers and responsibilities for both health and social care. This model for health and social care in England has some parallels with the Accountable Care Organization models used in the United States (US) (Shortell et al., 2014). The implementation of this model in England to date has been limited to the Greater Manchester region, where in 2016 a new administrative system was put in place giving local government greater autonomy over both health and social care provision. Plans for a further eight ACS schemes were also announced in 2017 (NHS England, 2017). The justification for these more devolved methods of health service management is that these should, in theory, encourage better coordination across different sectors to meet local needs more effectively, including more robust linkages between health and social care provision for clients with complex needs. At present, however, these systems are very new and it remains to be seen how effectively they will operate to ensure resilience to extreme weather.

From this brief summary, the picture emerges of a very complex and dynamic system of management for health and social care in England which implies that extreme weather planning requires both horizontal and vertical integration and coordination through various public and independent sector agencies. In the next part of this chapter we present one example of applied research which explored through local case studies what might be an effective, adaptable approach to address this situation.
An illustration from England of transdisciplinary working to address the complex issue of extreme weather resilience in health and social care

In this section we illustrate the potential of transdisciplinarity to address the complex issue of extreme weather resilience in health and social care. We consider this issue with reference to the case study of a research project carried out in England, designed to develop a transdisciplinary and cross-sectoral approach to planning for extreme weather events in the health and social care sector. This project, entitled *Built Infrastructure for Older People’s Care in Conditions of Climate Change* (BIOPICCC) (www.dur.ac.uk/geography/research/researchprojects/biopiccc/) was funded by the Engineering and Physical Sciences Research Council UK under their *Adaptation and Resilience in the Context of Change* network (ARCC), and carried out between 2009 and 2012 in parts of England. The funding source reflects the fact that this was a transdisciplinary project engaging specialists in environmental science and engineering, as well as public health and the social sciences spanning the interface with health research including the sociology of health, health geography and green social work. The research team engaged with a range of policymakers and service providers working at the local level in two case study local authority areas with the aim of making health and social care for older people more resilient to extreme weather. BIOPICCC demonstrated the importance of cross-sectoral working and collaboration with local communities during extreme weather events. It also illustrated the scope for vertical as well as horizontal coordination and knowledge exchange since it has helped to inform national strategy making in the UK, including the 2013 *National Adaptation Programme for the UK* (Defra, 2013) and the *Climate Change Risk Assessment for 2017* (HM Government Committee on Climate Change, 2017).

Our overall approach was informed by, and contributed to, research on complex socio-ecological systems as they relate to human health, which are also reviewed elsewhere (Curtis and Riva, 2010a, Curtis and Riva, 2010b). In our research findings from the BIOPICCC project (Curtis et al., 2017) we identified evidence illustrating key attributes of complex networked systems. These include features such as: diversity of agents operating through linked networks; a degree of openness of different parts of the system, so that change in one part of the network influences the operation of other parts; and a tendency to develop in ways that are ‘path-dependent’ (influenced by previous experience). Complex systems like those providing health and social care are also ‘emergent’, being dynamic and subject to change that is difficult to predict, with capacity for self-organisation and interactive co-evolution of different parts of the system.

Given the diverse composition of our academic team we were able to demonstrate the value of a transdisciplinary approach to researching the interplay between environmental processes linked to extreme weather events, and the various (built, institutional and social) infrastructure systems upon which health and social care depend. For example, in the initial stages of the project we assessed local variability in hazard and vulnerability across England, in order to identify parts of the country where it might be especially relevant and useful to carry out case study research (Oven et al., 2012). We collated and mapped information at the scale of local authorities which are key administrative units for coordination and management of health and social care. The indicators we used included demographic projection data to map trends in the growth of the older population, in order to identify areas where large relative and absolute numbers of people in the oldest age groups were currently located, where these were expected to expand most rapidly in future, and also where there were concentrations of relatively disadvantaged and socially isolated groups who may be less resilient to extreme weather. We carried out modelling
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using the UK Climate Projections 2009 Weather Generator to generate estimates of projected trends in the likelihood of heat waves and cold weather events looking ahead to 2030–2050; and used the river and coastal flooding projections for the 2050s from the UK government’s Foresight Flood and Coastal Defence Project (Environment Agency, 2004). In doing so, we deployed the knowledge of engineers and health geographers in the team to define the kinds of ‘critical’ extreme weather events that were likely to impact on health service infrastructures and on human health. We noted (Oven et al., 2012) that the areas likely to see the most rapid change in risk were not always those where the risks were currently greatest, and we considered that adaptation might be most challenging in places where weather-related risks were likely to be changing most quickly.

On the basis of this rapid nationwide risk assessment we identified a number of local authorities where we considered that issues of preparedness for extreme events in order to protect health and healthcare of older people were likely to be particularly pressing. We approached local NHS and government contacts in these areas to invite them to take part in our research and we were interested to find that there were more places volunteering to act as case studies than we were resourced to cover. This highlighted to us that for many local actors there was value in collaborating with an academic team which boosted their local resources for planning in this field. We maintained ongoing links with all those areas who had wanted to provide case studies, and we have subsequently followed up with them to explore how they could independently apply some of the learning from the two BIOPICCC case studies which were located in separate parts of the North and the South of England. The case study areas we selected were both in semi-rural areas served by small- to medium-sized towns, reflecting the significance of the issues in question for places outside the major cities in England. Extensions to the project also explored the relevance of our findings for older populations in London, giving us further insights into the experiences of ethnically diverse groups in major cities that were not the focus of the main BIOPICCC study.

The selection process for our case studies illustrated the geographical variability and complexity of the challenges we were aiming to assess. It was clear that, even within a relatively small country such as England, preparedness and resilience strategies would need to be adapted to quite different local conditions across the country. At the same time, there were clear parallels among some different localities in the types of problems they were likely to face, indicating that individual case studies chosen purposively to be representative of certain constellations of hazard and vulnerability might usefully help to inform strategy in other similar localities.

We therefore piloted our local research strategy with preparatory fieldwork in a third area in the North of England, which shared some of the attributes of our selected study areas. This helped us to identify the kinds of local partners with whom we would need to work and what kinds of issues might arise. We were also able to test aspects of our methodology before using them in our main case study. In this initial trial of our approach, we found that it was valuable to be able to engage with partners working in professional roles in various health and social care and other sectors, as well as with informants from the informal sector, many of whom were older people with complex health and social care needs. A key finding that re-emerged at various points in the research, was that informal networks were especially important as ‘first responders’, often taking critical action before the formal emergency services and health and social care agencies were able to reach the affected communities and intervene (Wistow et al., 2015). It was further noted that there were implications in terms of socially constructed and gendered roles of carers, who were predominantly women, reflecting other research which also emphasises the significance of women’s roles in building resilience to the impacts of disasters (Dominelli, 2013; Drolet et al., 2015). Recognising the need to include in our research informants who might be
physically or mentally infirm, we tested our approach with respect to the ethical and practical issues that arise when working with these groups. This was important to help us ensure that our ethical frameworks for further case study work were robust and that our methods were feasible.

In the core case studies conducted for this project, we first worked with local participants to build up a picture of the diverse groups of actors in the formal and informal sectors that had an important role to play in resilience planning. We then brought representatives of these different actors together in group discussions, and also conducted individual interviews with other informants, especially older people who were frail or housebound. Participants identified numerous examples where cross-sectoral action and knowledge sharing were essential to prepare in advance for extreme weather events. Participants also described several instances when communication across the system helped to maintain some continuity of essential services during extreme weather events (Curtis et al., 2017). Those involved needed to be able to exchange information about the nature and location of problems or possible solutions as they were occurring, and there were several examples of local collaboration to redeploy or draw upon local assets, such as staff working in care agencies who lived nearby, four-wheel drive vehicles for transport, or neighbourly assistance in order to cope with disrupted transport and supply networks.

At the same time, it was clear that (as is typical of complex systems) communication across the network was often partial and sometimes failed completely. For example, local residents were sometimes unaware of the provision made for them by formal sector services in organised rest centres in their locality (Curtis et al., 2017) or felt that informal networks were more important than formal services during extreme conditions (Wistow et al., 2015). There were occasions when different parts of the formal care system did not communicate effectively with each other about the resources that they could have potentially combined to ensure that medical and social care services were available in the areas worst affected by extreme weather (Curtis et al., 2017).

Consistent with the idea of ‘path dependency’ and contingency of complex systems, we were able to confirm that much valuable information could be collected from the accounts given by individuals based on their personal experiences of extreme weather. More recent experiences figured most prominently in these accounts so that, for example, problems of very cold weather that occurred during 2010, just before our fieldwork took place, figured much more prominently than issues associated with heat waves. We noted at this point, and throughout the BIOPICCC project, that it was more useful to engage with local actors on the basis of their own experiences and priorities (mainly related to very cold weather and flooding) than to impose an agenda based purely on scientific climate change risk assessments, which tended at the time to be focused strongly on heat waves, in light of climate change scenarios and scientific assessments of outcomes in southern England during the 2003 heat wave events. Indeed, while the question of ‘climate change’ was referred to, it was not one around which it was helpful to frame our enquiry, since it tended to divert the discussion into contentious and not very constructive debate about whether climate change was a real phenomenon.

Our experience in this project contributes to a significant body of research showing why it is more productive to empower participants to play an active role in shaping the agenda and the basis for planning for extreme weather than to construct an approach solely on the basis of predictions of risk from experts in the medical, environmental or engineering sciences. The fact that we were able to combine a range of disciplinary approaches in our study, including capacity in social sciences, helped us to explore how we might draw upon previous experience of different types of extreme weather to build a shared vision of what might help to enhance resilience, and how workable, locally adapted preparedness strategies might usefully draw on
local lay knowledge. For example, the use of participatory mapping and diagramming helped us to capture local knowledge to identify the built infrastructure to which continuous access was most essential for local users (Figures 29.1 and 29.2). At the same time, scientific knowledge was important in our discussions. For instance, it provided the basis to combine and visualise information about the nature and spatial distribution of local risks and the architecture of important infrastructural networks (Holden et al., 2013), and it helped to identify which might be the most vulnerable parts of the built infrastructure in local areas and how they might be strengthened.

Green social workers should ensure that they acquire the skills relevant for translating scientific expertise to lay audiences and local/indigenous knowledges to experts (Dominelli, 2012).

Some of the learning we produced has subsequently led us to work with PHE to produce guidance for local actors which distils previously separate sets of advice focused on different types of extreme weather, into generic basic principles which would be helpful in various extreme weather scenarios, including those associated with heat, cold or flooding. These PHE specific guidelines were only one of several illustrations from our work of the need for local, regional and national systems to be well-integrated and the challenges of producing national guidance which can be suitably adapted to varying local conditions. We found that national agencies were very open to findings from local studies, which enabled them to assess the local effectiveness of their current advice and guidance and how it might need to be altered or differently communicated. The work we undertook also helped to inform the work of the NHS Sustainable Development Unit (Sustainable Development Unit, 2014) and a toolkit produced

![Figure 29.1](image-url)  
**Figure 29.1** Service users and providers map the built infrastructure to identify vulnerability  
During the consultation with service providers and service users a map of the local area was used to record local knowledge about the location of different parts of the complex care systems used by older people. This helped to identify parts of the service infrastructure that might be most vulnerable to effects of extreme weather.
Knowledge accumulated during this project contributed to the risk reviews conducted as part of the *Climate Change Risk Assessment* published in 2017 (HM Government Committee on Climate Change, 2017). We have discussed elsewhere (Curtis et al., 2017) how this cycle of vertical transmission of knowledge from the local ‘grassroots’ level to national government agencies, and back down to local level, in the form of revised national guidance informed by local experience, forms a crucial part of resilience planning.

### Conclusions

The BIOPICCC approach seems relevant beyond the UK context and the wider literature suggests that similar strategies have been used elsewhere. The approach clearly reflects the ‘green’ principles that are at the core of this *Handbook*. The kind of approach we describe here, which enabled us to apply our understanding of complex health and social care systems in ways that help to make them more resilient to environmental risks, needs to be based on a transdisciplinary perspective. Risk assessment and planning for extreme events in these sectors has in the past tended to focus especially on scientific evidence which can be quantified and is amenable to systematic reviews using the kinds of methods that have been developed to inform evaluation and application of medical treatments. However, there is a growing realisation that qualitative

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**Figure 29.2** Prioritising service availability and impact according to duration of extreme weather event

Groups of participants in the discussion groups considered which parts of the local health and social care infrastructure were most essential for service users. The most essential parts of the system were often those to which older people needed continuous access. These should be prioritised in measures to improve resilience to extreme weather.
research which captures local knowledge, especially when undertaken in combination with scientific knowledge, allows us to better understand how expertise and assets can be deployed more effectively during emergencies. A limitation of in-depth qualitative studies is their restricted applicability to the settings where they have been carried out. However, as more qualitative studies of this type are undertaken, there is increasing scope for quasi-systematic assessment of information from multiple studies (for example, using constant comparison techniques) drawing out the whole body of evidence that they represent. Green social workers constantly collect qualitative evidence in communities and more of this can be made available to other sciences. This will help researchers to identify elements which may be more widely and internationally applied to help inform local practice, as well as identifying aspects of local experience that are strongly contingent upon local conditions and which may not be transferrable to other situations. Green social work has a lot to contribute, in terms of methods and empirical evidence, to such work. This can help local communities acting in collaboration with other agencies working at regional, national and international scales to take effective steps to build preparedness for extreme weather.

References


Part IX

Industrial and urban issues