

Article

Growing Old in a Changing Climate

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An aging society and a changing climate are two key policy challenges that need to be addressed to meet the United Nations Sustainable Development Goals and ensure a safe, secure, equitable, and sustainable future. By the end of the century, the global surface temperature is likely to increase by 1.5 °C to 2 °C although the 2015 Paris Agreement aims to reduce emissions and limit warming to below 2 °C (IPCC, 2013). As the planet warms, we can expect climate-related extremes, such as heat waves, droughts, floods, cyclones, and wildfires. Increasing climate variability will have direct and indirect effects on human health and well-being, especially of vulnerable groups (McMichael, Montgomery, & Castello, 2012).

An ageing society and a changing climate are two key policy challenges which need to be addressed to meet the United Nations Sustainable Development Goals and ensure a safe, secure, equitable and sustainable future.

Although many older people are healthy and socially and economically active, others are not, rendering them physically, financially, and/or emotionally less resilient in coping with a changing climate (Haq, Whitelegg, & Kohler, 2008; Sánchez-Gonzalez and Chávez-Alvarado, 2016). Understanding the factors that contribute to older people's vulnerability and resilience can therefore strengthen the capacity of government to prevent and minimize climate-related impacts on this demographic group.

Older people are often seen only as casualties of environmental change. Here I argue for the adoption of a “3C approach,” which examines older people as potential contributors, casualties, and champions of climate change as part of a broader interdisciplinary study of “climate gerontology” (Haq and Gutman, 2014) (see Figure 1).

Contributor

An individual's pattern of consumption changes over time, reflecting wealth, age, health, and social needs. Housing, food, energy, and personal travel all have an impact on energy use and carbon emissions (Haq, Minx, Owen, & Whitelegg, 2007). In particular, postwar baby boomers are reinventing old age, basing it on new consumption- and leisure-oriented lifestyles, where travel and cosmopolitanism are key features. Many are car dependent and enjoy international air travel, and changes in living arrangements have resulted in changes to residential energy efficiency.

Age-specific estimates of per capita carbon dioxide (CO₂) emissions in the United States for a set of selected carbon-intensive goods (i.e., electricity, natural gas, gasoline, air flights, tobacco products, clothes, food, and cars) show that average emissions increase with age. This continues until people reach their late 60s after which per capita emissions decrease, with the consumption of energy-intensive goods decreasing at very old ages (Zagheni, 2011). However, if retirement is postponed, the emission-reducing effects in later life would be lessened (O'Neil et al., 2012). Older people should therefore be seen as both contributors to and casualties of climate change.

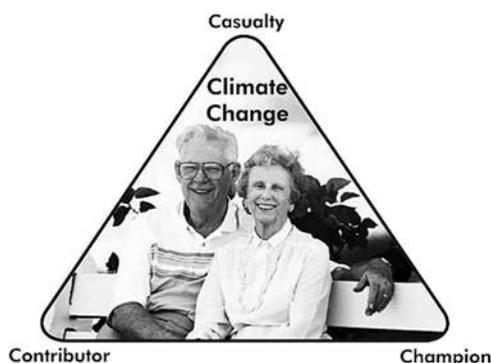


Figure 1. The 3C approach.

Casualty

The extent to which older people will be affected by climate-related events will be dependent on factors such as age, sex, gender, seasonal exposure level, magnitude of the threat, and differential coping capacities.

Heat Waves

Long-term increases in temperature variability can increase the risk of mortality in susceptible older people (Zanobetti et al., 2012). The August 2003 European heat wave saw temperatures reaching 40 °C, which resulted in the death of an estimated 14,802 mainly elderly people in France (Bhattacharya, 2003) and 2,139 excess deaths in England and Wales (Johnson et al., 2005). In 2010, Eastern Europe experienced a heat wave with extremely high daytime (e.g., 38 °C in Moscow), nighttime (e.g., 25 °C in Kiev), and daily average temperatures (e.g., 26 °C in Helsinki). This resulted in an estimated 55,000 excess deaths in Russia. During the same period, parts of eastern Asia also experienced extremely warm temperatures, and Pakistan was hit by devastating monsoon floods (Barriopedro, Fischer, Luterbacher, Trigo, & García-Herrera, 2011).

Wildland Fires

Warmer temperatures will also lead to increased fire activity. Wildland fires impact on human health; cause loss of life, damage to property, and community disruption; and affect water and air quality, agriculture, and natural ecosystems. The 2009 Australian “Black Saturday” bushfires resulted in 172 deaths. Almost a third of deaths (30%) were among people aged 60 and older; 9% had a chronic disability and were aged 70 or over (Handmer, O’Neill, & Killalea, 2010). Future fire seasons will be more severe and will require better fire management (Flannigan et al., 2013). This would include approaches that acknowledge the individual vulnerabilities of older people living in wildland fire-prone areas and developing appropriate fire plans that meet their needs.

Cold Winter Extremes

The risk of winter deaths in extreme cold waves (e.g., 2014 North America cold wave) tend to be disproportionately distributed among the elderly, with up to 30% of deaths occurring in individuals aged 75 and older (Callaly, Mikulich, & Silke, 2013). Women in this age category with respiratory disease are thought to be at particular risk. Countries with poor thermal efficiency standards in housing (Portugal, Greece, and the United Kingdom) tend to have high excess winter mortality (Healy, 2003).

Flooding

Floods have a number of potential negative effects on health, including mortality, injuries, fecal-oral disease, vector-borne disease, rodent-borne disease, and mental disorders. In Europe, a total of 19 flash floods and 162 general floods were reported in the period 2003–2012 (Brown and Murray, 2013). Flooding can cause stress, which together with pre-existing health conditions can have a significant impact on the health and well-being of the flood victim. In particular, populations in low-income countries who inhabit high-risk flood plains and coastal zones are more vulnerable due to lack of public health infrastructure, preexisting poverty, and lack of insurance coverage. Evidence increasingly suggests that older people in these areas have more difficulty than other groups when it comes to leaving their place of residence in emergency situations (WMO, 2013).

Tropical Cyclones

Tropical cyclones are expected to occur more often and to be more severe due to changing climate. The 2013 Typhoon Haiyan that devastated the Philippines is considered to be the most powerful tropical cyclone ever recorded. In the past half century, approximately 2,544 people died in the United States or its coastal waters due to tropical cyclones. Hurricane Katrina in 2005 was responsible for an estimated 1,100 deaths, approximately 2,000 injuries, and the displacement of more than 1 million people (Henderson, Roberto, & Kamo, 2010). Nearly 60% of the flooding-related fatalities following Hurricane Katrina were among persons aged 65 and older (Jonkman, Maaskant, Boyd, & Levitan, 2009).

Air Pollution

Higher temperatures can result in changes in air quality with an increase in ground-level ozone levels (McMichael, Montgomery, & Castello, 2012). This significantly affects respiratory health, both independently and synergistically with weather conditions. The risk to older people from air pollution is especially high in individuals suffering from preexisting medical conditions such as chronic obstructive pulmonary disease. In particular, a high association between levels of nitrogen dioxide and particulate matter and heart and lung disease in older people

and hospitalization for community-acquired pneumonia exists, and long-term exposure to traffic-related air pollution increases the risk for asthma hospitalization in older people (Andersen et al., 2012).

Food Shortages and Water Stress

Climate variability is expected to pose a risk to the stability of food systems, further exacerbating food insecurity in those regions that are currently vulnerable to hunger and undernutrition. This will further increase food inequalities, making vulnerable older people and communities less resilient to extreme weather (Trenberth et al., 2014). Access to and utilization of food is expected to be further affected by indirect climate effects on income, access to safe drinking water, and health.

Infectious Disease

Higher temperatures and changes in precipitation can cause proliferation of vector organisms (e.g., fleas, mosquitoes, and ticks) and immediate hosts. This is likely to result in increased risk of diseases such as malaria, dengue fever, lyme borreliosis, and schistosomiasis (Gamble et al., 2013). Flooding can increase contamination by waterborne and foodborne pathogens via flood waters affecting food crops and sewer runoff. Drinking water, seafood, and fresh produce can be affected. Risk of waterborne disease (e.g., leptospirosis, norovirus) increases following flooding. Older people are more vulnerable to gastrointestinal disease from waterborne pathogens due to preexisting medical conditions and changes in immune system and gastrointestinal function that occur with aging. In addition, they may fail to seek prompt medical attention, which can lead to dehydration.

Champion

An aging population provides an increasing number of experienced individuals with different economic and social resources. Senior environmental volunteerism can play a role in building local community resilience to address environmental challenges such as climate change and fuel and food insecurity. Volunteerism can also provide opportunities for better integration in later life and confer benefits both to the individual (i.e., health and well-being) and community (e.g., social cohesion). However, if senior environmental volunteering is to reach its full potential, then we need to remove cultural, income, health, and practical barriers and dispel and challenge discrimination, perceptions, and attitudes (Pillemer, Wagenet, Goldman, Bushway, & Meador, 2010).

Addressing the Challenge

We should take action in three key areas to address the challenge of growing old in a changing climate.

Reduce the Carbon Footprint of Older People

A survey of public opinion on climate change found young Americans (18–29 years) are more likely than those aged 50 and older to see global warming as a very serious problem (52% vs. 38%), to believe it will affect them personally (34% very concerned vs. 21%), and to support U.S. participation in an agreement to limit greenhouse gas emissions (85% vs. 60%) (Stokes, Wike, & Stewart, 2015).

We therefore need to promote greener attitudes and behaviors to influence individual lifestyle choices of older people and to reduce their carbon footprint. Peer-to-peer approaches to engage older people could provide more credibility than top-down approaches (Haq, Brown, & Hards, 2010). In addition, we also need appropriate infrastructure and incentives that encourage greener behavior in later life. Because there will be a high number of urban seniors, achieving age-friendly cities will be important to provide the structures and services (e.g., transport, housing, and access to local services) needed to support healthy and independent living.

Protect Older People from the Impact of Extreme Weather Events

We require appropriate policies to ensure older people reach later life with sufficient reserves (e.g., coping skills, strong family and social ties, and savings and assets), to reduce the challenges they face in later life, and to provide them with adequate health and social protection. If we are to better protect older people, then healthy lifestyles, acquisition of coping skills, strong family and social ties, active interests, and, of course, savings and assets will help ensure that people's reserves are, and remain, strong in later life (Grundy, 2006).

Mobilize the Experience of Older People

Seniors' knowledge of the local environment, its vulnerabilities, and how the community has responded in the past allows them to play a key role in reducing the negative impact of current climate-related disasters. In particular, their knowledge of coping mechanisms can be critical when developing local disaster risk reduction and adaptation plans. However, a general lack of political awareness of the potential of older people in environmental volunteering exists. Further efforts should be made to mobilize the increasing number of older people and remove barriers to volunteering for older people, such as insurance restrictions, health and safety regulations, and lack of access for disabled people.

Older peoples' knowledge of the local environment, its vulnerabilities and how the community has responded in the past allows them to play a key role in reducing the negative impact of current climate-related disasters.

Conclusion

We currently lack a coherent policy response that addresses the interface between climate change and older people. If we are to deal with the range of impacts a changing climate will have on the lives of an aging population, we need public policies to be sharpened, focused, and coordinated. The promotion of interventions throughout the course of a person's life could, for example, include improvements to future-proof and climate-proof homes and provide information on how to cope with extreme weather events such as heat waves and flooding. In addition, effective health and social care can help people cope with the challenges posed by a changing climate in later life. Social support can help prevent a reduction in reserves or help rebuild reserves. Such interventions include access to good acute care and rehabilitation when needed, substitute professional social and psychological help in a crisis (if desired), provision of long-term help, and income support.

National, regional, and local agencies have a role to play in reducing the sensitivity of communities to extreme weather events not only through the provision of well-planned infrastructure and maintenance of services but also through partnership with key stakeholder groups, health agencies, government organizations and charities.

Growing old in the twenty-first century will bring with it the unique challenge of adapting to changing weather patterns caused by a warmer climate. This will require an interdisciplinary approach to better understand the intersection between population aging and climate change and provide the evidence base to ensure that policy harnesses the contributions older people can make to climate action while reducing their vulnerability, ensuring they reach later life with greater resilience.

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