

Preparing older citizens for global climate change

Collaborate and advocate to meet patient needs and implement policy change.

By Margarete L. Zalon, PhD, RN, ACNS-BC, FAAN

IN 2015, an estimated 8.5% of the world's population was 65 years and older; that number is expected to double by 2050 and total 1.6 billion people. The World Health Assembly has named 2020-2030 as the decade of healthy aging, and the World Health Organization is developing a framework for helping people live long and happy lives by focusing on individuals' functional abilities and their physical and social environments.

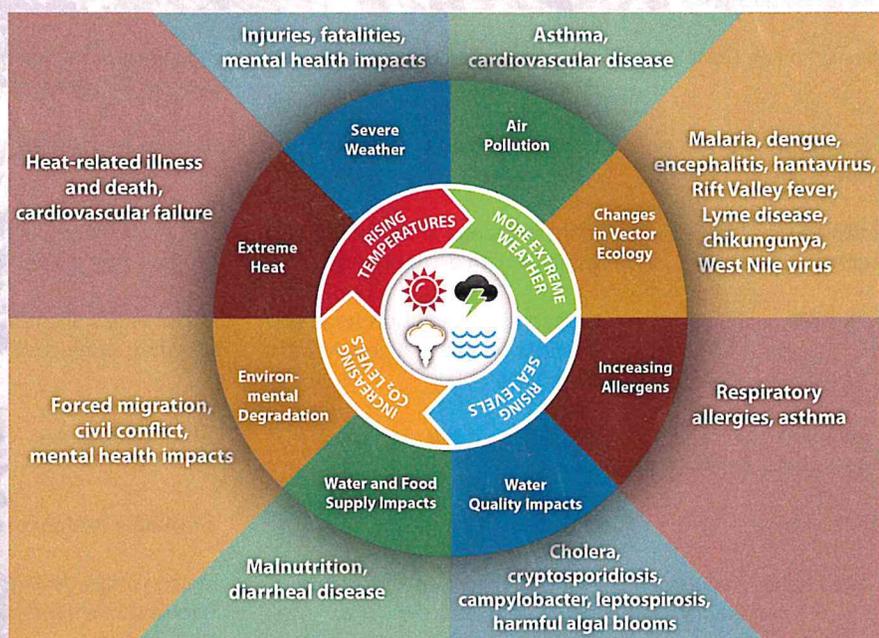
The aging in population is occurring as the effects of climate change are increasing. (See *Impact of climate change on human health*.) For example, heat waves have included death tolls in the thousands (Europe, 2003, 71,310; Russia, 2010, 55,736; Europe, 2006, 3,418; India, 1998, 2,541 and 2015, 1,826+) that disproportionately affected older adults. Nurses must understand the connection between global environmental changes and older

Impact of climate change on human health

Environmental risks to health include weather (temperature extremes, storms, floods, wildfires, tornadoes, cyclones), exacerbated vector-borne disease, compromised agriculture (poor soil and food quality, plant diseases), compromised water quality, and decreased habitability of population centers because of sea-level rise, air pollution, violence, and conflict.

Populations vulnerable to climate change include anyone living within or near areas:

- where endemic disease is associated with weather conditions
- with combined climate effects and limited food and water supply
- with current environmental and socioeconomic stresses with little capacity to adapt.



Source: Centers for Disease Control and Prevention. Climate effects on health. 2014. cdc.gov/climateandhealth/effects

Adaptive strategies for secondary prevention efforts

Adaptive strategies aim to reduce the impact of global climate change on health.

Category	Implementation strategies
Built environment	Home weatherization, district heating and cooling systems (centralized distribution of heating and cooling through an insulated pipe network), home energy assistance for low-income households, sidewalk plowing, coniferous tree planting, shade shelters
Community services	Warming centers, emergency services, monitoring (water levels, temperature, fire, flooding, air quality), public health surveillance for disease outbreaks, registries for vulnerable elderly, early-warning systems, community evacuation plans, insect control
Protective policies	Standards and policies for outdoor worker hours and clothing, preventive health services, water resource management, sanitation
Education	Safe activity guidance during inclement weather, nutritional and hydration recommendations, disaster preparedness, community agency resources

Sources: Conlon et al. 2011; Patz et al. 2014.

adults' health. Current environmental trends require vigilance and specific strategies to protect the health of this vulnerable population.

Aging and climate change

Healthcare systems aren't prepared to address the coming impact of climate change and the needs of older citizens, who are at risk of high rates of chronic disease, limited access to healthcare and medication during a crisis, respiratory distress during temperature increases, poor diet and nutrition, reduced access to water, and higher poverty rates in some settings. In addition, during a climate crisis, older adults (even those with limited access to food and water distribution centers) may give their meager supplies to family members.

A 2018 study by Kishore and colleagues of Hurricane Maria's after-

Resources for older adults

Raise awareness about older adults' vulnerability to the effects of climate change by recommending these self-assessment tools. Print out the information for patients who don't have access to the internet.

Organization	Resource	Website
American Association of Diabetes Educators	Diabetes emergency preparedness	diabeteseducator.org/living-with-diabetes/disaster-preparedness
American Red Cross	Disaster preparedness for seniors by seniors	redcross.org/images/MEDIA_CustomProductCatalog/m4640086_Disaster_Preparedness_for_Srs-English.revised_7-09.pdf
Centers for Disease Control and Prevention	Emergency preparedness for older adults	cdc.gov/aging/emergency
Environmental Protection Agency	Climate change and extreme heat: what you can do to prepare	epa.gov/sites/production/files/2016-10/documents/extreme-heat-guidebook.pdf
ReliefWeb	Humanitarian inclusion standards for older people and people with disabilities	https://reliefweb.int/report/world/humanitarian-inclusion-standards-older-people-and-people-disabilities
National Oceanic and Atmospheric Administration	U.S. climate resilience toolkit	toolkit.climate.gov
United Nations	Climate change toolkit	unhabitat.org/books/climate-change-toolkit
United States Department of Health and Human Services	Primary protection: enhancing health care resilience for a changing climate	toolkit.climate.gov/sites/default/files/SCRHCFI%20Best%20Practices%20Report%20final2%202014%20Web.pdf

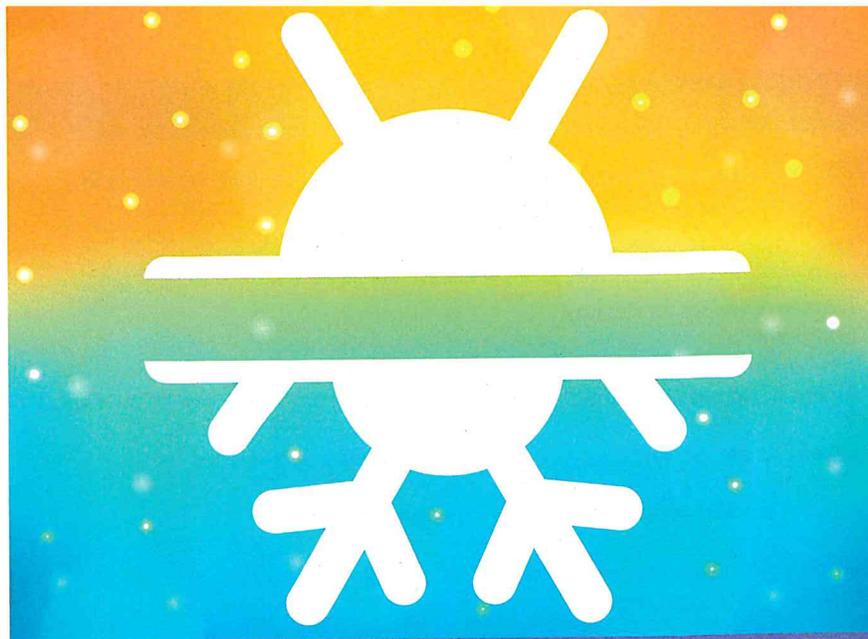
math in Puerto Rico indicated that there were 4,645 more deaths than would ordinarily have been expected during that time period and that this number was most likely underestimated. The median age of those who left and didn't return or were missing was 25 years, compared to 50 years for those who died or stayed; one-third of deaths were related to delayed or interrupted healthcare. Disruption to healthcare services included inaccessible medications (14.4%), loss of electrically powered respiratory services (9.5%), closed healthcare facilities (8.6%), absent physicians (6.1%), and inability to reach 911 services (8.8%).

Common physiologic changes associated with aging make older adults particularly vulnerable to the effects of global climate change. These changes include reduced ability to regulate body temperature, changes in sweating, reduced sense of thirst and awareness of dehydration, decreased cardiac reserve, decreased respiratory muscle strength and vital capacity, decreased immune response, reduced mobility, and cognitive changes. The potential for a range of climate effects on older adults is broad and complex and includes temperature extremes, vector-borne illnesses, storms, financial loss, extended allergy seasons, pollution, and disasters. For example, extreme heat may result in heatstroke and extreme cold may lead to hypothermia.

Older adults' vulnerabilities to climate change are exacerbated by poverty, polypharmacy (or extended lack of access to medication), and limited social networks.

Social impact of climate change

Older adults also face social risks associated with aging, including isolation, lack of family or social support, and poverty. Women living alone are most at risk. Older adults may be left behind in war zones and face the risk for violence and



Adaptive strategies for extreme temperatures

Share these adaptive strategies to help patients reduce the effects of extreme temperatures.

Strategies to prevent heatstroke

Strategies to prevent hypothermia

Stay out of the sun.

Set heat at 68° F to 70° F. Close off rooms not in use.

Remain in a cool place; air-conditioned is preferable.

Keep blinds and curtains closed. Use caulk or weather stripping around windows.

Drink fluids but avoid caffeine and alcohol.

Dress warmly even if staying home; wear a cap or hat.

Shower, bathe, or sponge with cool water.

Put blanket over legs and wear socks and slippers.

Lie down or rest in a cool place.

Wear long underwear under pajamas.

Keep blinds and shades drawn during hot times of the day.

Limit or eliminate alcohol.

Spend time during mid-day in a place with air-conditioning (movie theater, mall, senior center).

Ask family or friends to check in.

Avoid crowds.

Dress warmly when going out.

Limit outdoor exercise during hot weather.

Change clothes if they become damp or wet.

Sources: Adapted from National Institute on Aging. Hot weather safety for older adults. 2016. nia.nih.gov/health/hot-weather-safety-older-adults; National Institute on Aging. Cold weather safety for older adults. 2018. nia.nih.gov/health/cold-weather-safety-older-adults

injuries. Social inequalities are exacerbated in the presence of environmental stressors. Various environmental, behavioral, lifestyle, and socioeconomic effects interact.

Mitigation and adaptive strategies

Addressing older citizens' needs requires an approach that includes mitigation and adaptation.

Advocacy resources

Find out how you can advocate for policies and strategies that reduce the impact of climate change on older citizens' health.

Organization	Website
Alliance of Nurses for Healthy Environments	envirn.org
American Nurses Association	nursingworld.org/practice-policy/advocacy/
Elders Climate Action	eldersclimateaction.org
Health Care Without Harm	noharm.org
World Health Organization: Climate Change and Human Health	who.int/globalchange/resources/toolkit/en/

Mitigation strategies focus on reducing the underlying causes of global challenges to health by reducing human contributions to the greenhouse effect. Because the healthcare sector also contributes to greenhouse emissions, efforts should be extended to decreasing healthcare facilities' carbon footprint, decreasing the amount of travel needed to obtain healthcare services or medication, reducing medical waste, and expanding green space in cities where more heat is generated. Several groups provide tools and guidance in advocating for mitigation strategies. Health Care Without Harm (noharm.org) has a global focus, and HelpAge (helpage.org) focuses on strategies to ensure that older people's rights are addressed.

Adaptive strategies focus on secondary prevention to reduce the impact of global climate change on health. They address built environment, community services, protective policies, and education for older citizens and their caregivers. Older adults may have limited ability to adapt to global climate changes, so they may need additional services to assist with implementing adaptive strategies. (See *Adaptive strategies for secondary prevention efforts*.)

Nursing actions

Nurses have a long history of focusing on the environment when

Weather extremes have an *impact* on older adults' day-to-day lives because of mobility restrictions and social isolation.

implementing health-promotion strategies. You can play an integral role at several levels: in your own family, through direct patient care, and in your communities and beyond to prevent health marginalization and deterioration in vulnerable older citizens.

Assess and recommend

Much of the data and publicity about the risks of climate change and the elderly are focused on mortality, but weather extremes have an impact on older adults' day-to-day lives. You can help older adults prepare for and manage mobility restrictions and social isolation that may occur. Think about the specific effects that older adults are likely to experience in your own community (winter storms, heat waves, hurricanes, tornadoes, flooding, air pollution, wildfires) and consider how they might restrict normal daily ac-

tivities. Start with a needs assessment of vulnerable adults within your own family and use the results to develop recommendations for those in your practice. Focus on individual capacity; relationships with family, friends, and the community; and the community's infrastructure.

Encourage older adults to conduct a self-assessment with one of the many available online toolkits. (See *Resources for older adults*.) Completing an assessment can contribute to raising risk awareness for older adults who don't consider themselves to be susceptible to the effects of climate change. Some of the most vulnerable older adults may not have access to or the ability to use internet resources, so download these toolkits and review key features of preparedness with them.

Advocate and volunteer

Be an advocate within your healthcare organization and community for policy changes that include implementing climate change mitigation and adaptation strategies. Take measures to ensure that older patients are well-informed about climate risks to health, and work with your organization's leadership to include pertinent questions on health histories, post visible signage about climate change health risks, and share written literature. (See *Adaptive strategies for extreme temperatures*.)

Serve as a champion to address needed changes in the built environment, planning for community services, and advocating for the implementation of policies that protect workers, including older adults. And serve as an early-warning system by alerting public health officials when you see unusual changes in patterns of illness that might be attributed to climate (for example, increased respiratory illnesses in the summer months). From a broader policy perspective, you're ideally positioned to examine the social service infrastructure available in

your community. For example, does community have a heat wave response plan? Learn about the parameters for its activation, the media communication plan, daily checks for at-risk older adults, transportation to climate-controlled community centers, and the preparation of emergency and urgent care center staff.

Volunteer with local social service or government agencies to serve as a responder during a disaster. At a more macro level, you can participate in efforts to address policy implications of global climate change (for example, advocating for a national smoke health warning system and emergency services for at-risk older adults). You also can work to implement policies to lift restrictions on prescription refills in the face of an impending emergency or participate in developing a plan to address extreme heat or cold events. Identifying the potential stumbling

Encourage older adults to conduct a *self-assessment* with one of the many available online toolkits.

blocks that older adults may face in an emergency will facilitate preparedness and enhance safety.

Partner with older adults and others by joining advocacy groups to adopt climate mitigation strategies in your community. Advocacy groups can include diverse stakeholders such as nurses' organizations (e.g., state nurses associations, special interest groups), healthcare professional groups, elder advocacy groups, single-issue groups, and local and national environmental organizations. (See *Advocacy resources*.)

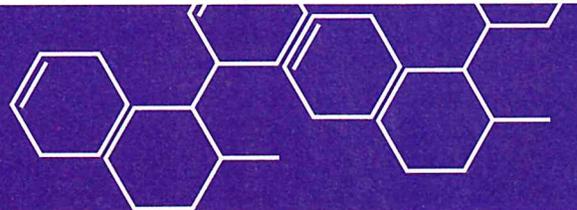
Deliberate effort, meaningful change

According to the 2015 Lancet Commission report on Health and Climate Change, responding to climate change could be the "greatest global health opportunity of the 21st century." That response, when caring for older adults, requires a concerted collaborative effort that begins with addressing individual patients' needs. Advocate for thoughtful planning and implementation of mitigation and adaptive strategies to meet the needs of this vulnerable population. And engage in deliberate efforts to institute meaningful policy changes to ensure a sustained response. ★

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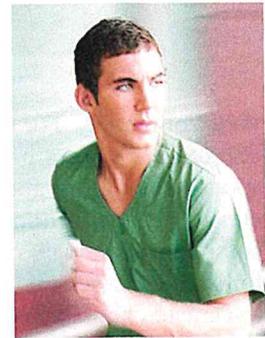
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Pulmonary atelectasis and retained secretions



Critical thinking averts serious consequences.

By Amy Shay, PhD, RN, APRN-CNS

GARY LEVIN* is a 74-year-old man on the medical-surgical unit 3 days after a partial gastrectomy for stomach cancer. He has a 40 pack-year smoking history. Mr. Levin's initial postoperative recovery was slowed by vomiting and pain.

History and assessment hints

Lisa, Mr. Levin's nurse, completes her initial assessment: BP 138/78 mmHg, HR 80 beats/minute (bpm), RR 20 breaths/minute, oxygen saturation (O₂ sat) 92% on 2 L/minute by nasal cannula, and temperature 100° F (37.8° C). Mr. Levin rates his pain level as 2 on a scale of 0 to 10, "as long as I don't try to move." When Lisa auscultates Mr. Levin's lungs, she hears rhonchi over the upper lobes and diminished breath sounds in the bases. Mr. Levin's incision is intact with no signs of infection. He is passing flatus and taking fluids by mouth.

Lisa elevates the head of the bed to 40 degrees to help improve his O₂ sat. Mr. Levin admits that he's not using the incentive spirometry (IS) device. He has shallow breathing, pain on deep inspiration, and a weak, ineffective cough. Lisa administers hydrocodone/acetaminophen 5 mg/325 mg by mouth for pain.

Call for help

When Lisa answers Mr. Levin's call light 45 minutes later, he says, "I can't breathe very well." He's pale and restless, his respirations are shallow at 30 breaths/minute, his O₂ sat is 89%, his BP is 166/90 mmHg, his HR is 110 bpm, and his breath sounds are diminished. Lisa suspects worsening postoperative atelectasis and retained secretions. She notifies the rapid response team (RRT). Lisa raises Mr. Levin's bed to 90 degrees and applies 40% humidified oxygen by mask. She begins continuous pulse oximetry, places Mr. Levin on a cardiac monitor, and readies suctioning equipment.

On the scene

The RRT physician agrees with Lisa's suspicions and orders a portable chest X-ray. The team explains to Mr. Levin the importance of expanding his lungs and clearing his airway, but he can't clear the secretions. Nasotracheal suctioning removes thick, tenacious mucus. Vigor-

ous coughing during suctioning loosens more secretions, which Mr. Levin can now expectorate on his own. His vital signs return to baseline, and his O₂ sat is 96%.

Outcome

Lisa updates Mr. Levin's surgeon, who orders a follow-up chest X-ray, pulmonary hygiene with IS and positive expiratory pressure therapy, continuous pulse oximetry, and humidified oxygen titration to maintain O₂ sat at 92% or greater. The activity order is changed from "up as tolerated" to "daily ambulation in hall." The rest of Mr. Levin's hospital stay is uneventful.

Education and follow-up

Atelectasis can trigger a cascade of events linked to postoperative respiratory failure in hospitalized older adults. Risk factors include advanced age, obesity, upper-abdominal or thoracic surgery, smoking history, reduced mobility, sedation, neuromuscular disorders, chronic lung disease, and pain with deep breathing.

Initial signs of atelectasis include minor increases in RR and BP, low-grade fever, restlessness, and a downward trend in O₂ sat. Breath sounds will be diminished over the affected lung fields, and crackles may be heard at the end of inspiration as collapsed alveoli snap open.

Preventing atelectasis includes enhancing lung expansion and airway clearance and should begin with preoperative patient education about pain control, mobility, and deep-breathing exercises with directed cough. Postoperative pain control, early ambulation, and cough and deep-breathing exercises (or IS) will reduce the likelihood of retained secretions that can cause mucous plugs and airway obstruction. Systemic hydration and adequate airway humidification help prevent thickened mucus.

Lisa's critical thinking avoided possible emergent bronchoscopy for removal of secretions or possible respiratory arrest. ★

*Names are fictitious.

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