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The power problem: how power cuts are threatening home care

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7-9 minutes



As severe weather events become more prevalent, disruptions to the electrical grid may become a sad fact of life. Credit: Shutterstock

For hundreds of thousands of Americans, medical equipment like oxygen pumps, ventilators and sleep apnoea machines can spell the difference between life and death. An astonishing 2.6 million Medicare beneficiaries rely on electricity dependent equipment of this kind to live independently in their homes.

From one perspective, the shift towards home-based care is quite remarkable. In the past, the only option for these patients would have been to stay in hospital or an assisted living facility, often against their wishes. Today, many older people with chronic diseases can maintain a degree of autonomy. The US spent \$103bn on home healthcare in 2018, and as the population ages, that figure is expected to rise.

From another perspective, this reliance on complex devices comes with risks attached. If the power cuts out while you're in hospital, the system will switch to an emergency backup power generator, meaning your device function should not be affected. Unfortunately, there is generally no such recourse if the power cuts out at home.

"When we lose power, even for several hours, this group's health can be in danger," says Dr Joan Casey, an environmental epidemiologist at Columbia University. "We face a dual problem in the United States: an ageing electric grid and more frequent storms and wildfires, partially driven by climate change. Neither of these problems looks like it will improve in the short-term."

How the problem is manifesting

Unfortunately, there have been quite a few documented cases of power cuts putting patients' lives at risk. One [study](#), which looked into a widespread North American blackout in 2003, found that within a 24-hour period, 23 out of 255 patients arriving at the emergency department presented with medical device failure.

In the aftermath of Hurricane Isaac in 2012, 901,000 electricity customers in Louisiana suffered blackouts. [Researchers](#) have highlighted how hospitals were overwhelmed with 'electrical emergencies' as medical devices lost power. Charities were forced to establish 'electricity shelters' to pick up the slack.

As severe weather events – wildfires, storms and floods – become more prevalent, disruptions to the electrical grid may become a sad fact of life. In 2019, the utility company PG&E decided to cut power to 800,000 customers in California, as a means of preventing wildfires. A spokesperson said that 29,819 customers with medical needs would be affected, and advised them to purchase backup generators.

However, not all device owners were contacted – and the advice may not have been practical across the board.

"Backup power, for the most part, remains a luxury," says Casey. "We see a steep socioeconomic gradient in who can afford a generator or who has the ability to keep one – think apartment dwellers who cannot."

Elsewhere in the world, the risk is shouldered not just by home-care patients, but by hospital patients too. In 2019, a five-day blackout in Venezuela caused havoc across the nation, with the backup

generators failing in some hospitals. Twenty-six people lost their lives in hospitals as a direct result of the outage.

This year, a similar story is being reported in rural India. With many Covid-19 patients on ventilators, frequent power cuts have made it difficult to maintain a steady oxygen supply – and not all hospitals have access to the backup power they sorely need.

A public health issue

As well as the threat posed by climate change, there are various other reasons why power outages might occur. Demand for electricity is surging, fuelled by new technologies like electric cars. Cyberterrorism attacks can impact power grids. Power supply may become more intermittent as we shift to renewable energy sources.

It's important to acknowledge, then, that the confluence of power cuts and homecare represents a real and growing problem. As Casey sees it, this isn't a problem for individuals to solve – but rather a pressing public health issue.

In a recent [paper](#), Casey and her co-authors explored a possible solution: establishing community charging stations with battery storage. The technology would run on solar power, independently from the electric grid, and could provide clean, reliable, emergency power for times when the grid is unavailable.

“We need neighbourhood charging stations that can bridge people between outages,” she says. “This can prevent trips to the emergency room and foster a greater sense of community. It also comes with additional benefits – potential for reduced electricity costs, community resiliency, reduced air pollution levels, etc.”

Powering up for the future

Who would shoulder the costs is an interesting question, but Casey thinks the federal government should provide subsidies for distributed generation. This would both alleviate strain on the grid and provide a safeguard against outages, as well as helping to prevent health emergencies.

“The price is constantly going down,” she points out. “Solar has gotten cheaper and now is more affordable than natural gas in many parts of the country. We are also getting better at storage.”

Utility companies may have a role to play here too. Last year,

PG&E attempted to pre-empt any issues by supplying batteries to 10,500 eligible customers ahead of wildfire season. These were low-income people, reliant on electricity-dependent devices, who lived in high-risk fire zones.

“The safety of customers is our most important responsibility,” said Laurie Giammona, PG&E senior vice president. “We understand power shutoffs impact all customers, especially those with medical needs.

“We are working with local organisations to provide portable batteries to customers who rely on medical equipment to live. We hope these batteries will help reduce fear and keep our customers safe before, during and after a shutoff.”

In the meantime, many questions remain about how charging stations could work, who would be responsible, and how great a threat these power cuts might ultimately turn out to be.

“It would be great to track changes in health after new solar and storage projects go into place,” says Casey. “This could bolster the argument that this is the next right step. We should start with some of our most vulnerable communities, including public housing where individuals may not be able to afford a generator or cannot store on site.”

One thing is clear – if homecare is to live up to its touted potential, ensuring patient safety in the event of a blackout needs to be a top priority.

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