ASPR Administration for Strategic Preparedness & Response

National Academies Action Collaborative on Disaster Research Symposium on Disaster Data Science:

"emPOWERing communities to protect electricity and health care dependent at-risk individuals in disasters"

Kristen Finne

Director, HHS emPOWER Program

April 2, 2024

Use Case – Community – Preparedness/Response

"Public health, health care, and emergency management officials need timely data and an understanding of the particular needs of at-risk populations living independently in their communities to better anticipate, plan for, respond to, and help address their needs prior to, during, and after an incident, emergency, or disaster."

ULTIMATE GOAL

Provide federal to community level partners with readily meaningful, consumable, and actionable federal health data, tools, and informational resources to enhance planning for, responding to, and supporting their needs, including evacuations, of at-risk populations prior to, during, and after an incident, emergency, or disaster.

Case Champion: Kristen Finne, Director, HHS emPOWER Program, ASPR

Data Sources:

- Centers for Medicare and Medicaid Services, Medicare Program administrative claims data
- Severe weather and other hazards

WIN:

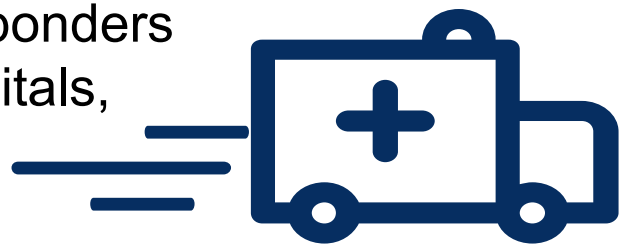
The HHS emPOWER Program, a partnership between ASPR and the Centers for Medicare and Medicaid Services (CMS), provides federal health data, geographic information systems (GIS), maps, artificial intelligence (AI) tools, training, informational resources, and technical assistance to help federal-to-community partners to understand and take action to protect the health of at-risk individuals who live independently, and rely on life-maintaining and assistive essential health care services and/or electricity-dependent durable medical equipment.

Overview of the HHS emPOWER Program

Why was the HHS emPOWER Program Created?

Millions of Americans rely on electricity-dependent durable medical and assistive equipment (DME) and devices and essential health care services to live independently in their homes.

In the event of an **incident**, **emergency, or disaster**, at-risk populations often seek immediate care from first responders (e.g., EMS[1]), hospitals, and shelters.



This leads to **surges in health care demand** and **stress** on systems and shelters.

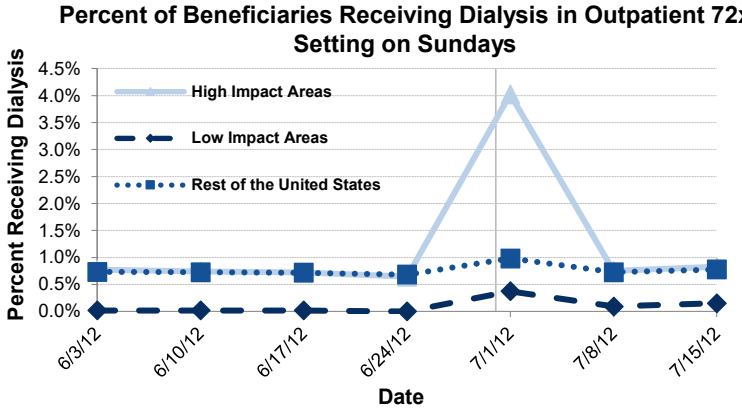
The Centers for Medicare & Medicaid Services (CMS) data can help communities **protect the health** of community-based at-risk populations, **ensure continuity of care,** and **reduce system stress**.

[1]Emergency Medical Services

Scientific Evidence-Based Identified Challenges

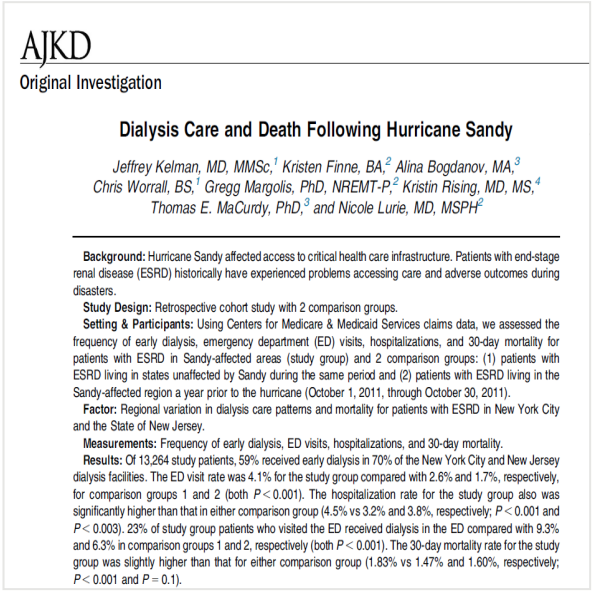
Mid-Atlantic Storm-Derecho

- ✓ **At-risk beneficiaries** in impacted geographical region
- ✓ **Access issues** for critical health care facilities
- ✓ Market share by facility type
- ✓ **Utilization/treatment** pattern **disruptions**
- ✓ Potential adverse outcomes
- ✓ **Best practices/gaps** for future emergency planning
- ✓ Current and historical **End-Stage Renal Disease (ESRD) claims data delay trends**



Hurricane Sandy Pilot Study

Dialysis Care and Death Following Hurricane Sandy[1]



AJKD

Original Investigation

Dialysis Care and Death Following Hurricane Sandy

Jeffrey Kelman, MD, MMSc,[1] Kristen Finne, BA,[2] Alina Bogdanov, MA,[3] Chris Worrall, BS,[1] Gregg Margolis, PhD, NREMT-P,[2] Kristin Rising, MD, MS,[4] Thomas E. MaCurdy, PhD,[3] and Nicole Lurie, MD, MSPH[2]

Background: Hurricane Sandy affected access to critical health care infrastructure. Patients with end-stage renal disease (ESRD) historically have experienced problems accessing care and adverse outcomes during disasters.

Study Design: Retrospective cohort study with 2 comparison groups.

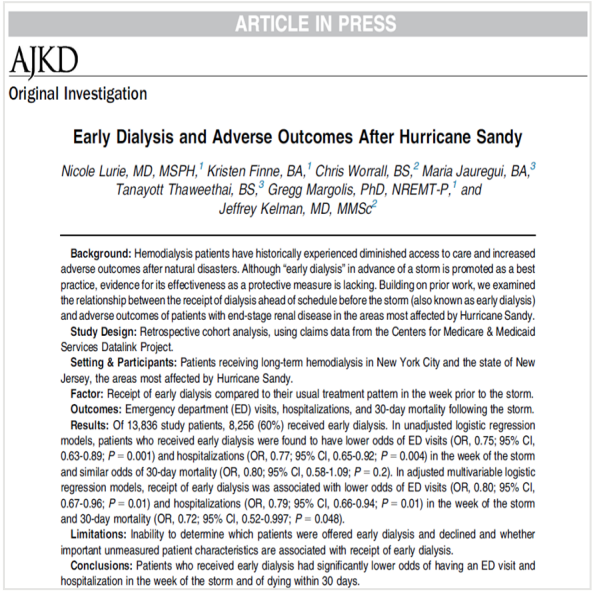
Setting & Participants: Using Centers for Medicare & Medicaid Services claims data, we assessed the frequency of early dialysis, emergency department (ED) visits, hospitalizations, and 30-day mortality for patients with ESRD in Sandy-affected areas (study group) and 2 comparison groups: (1) patients with ESRD living in states unaffected by Sandy during the same period and (2) patients with ESRD living in the Sandy-affected region a year prior to the hurricane (October 1, 2011, through October 30, 2011).

Factor: Regional variation in dialysis care patterns and mortality for patients with ESRD in New York City and the State of New Jersey.

Measurements: Frequency of early dialysis, ED visits, hospitalizations, and 30-day mortality.

Results: Of 13,264 study patients, 59% received early dialysis in 70% of the New York City and New Jersey dialysis facilities. The ED visit rate was 4.1% for the study group compared with 2.6% and 1.7%, respectively, for comparison groups 1 and 2 (both $P < 0.001$). The hospitalization rate for the study group also was significantly higher than that in either comparison group (4.5% vs 3.2% and 3.8%, respectively; $P < 0.001$ and $P < 0.003$). 23% of study group patients who visited the ED received dialysis in the ED compared with 9.3% and 6.3% in comparison groups 1 and 2, respectively (both $P < 0.001$). The 30-day mortality rate for the study group was slightly higher than that for either comparison group (1.83% vs 1.47% and 1.60%, respectively; $P < 0.001$ and $P = 0.1$).

Early Dialysis and Adverse Outcomes After Hurricane Sandy[2]



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AJKD

Original Investigation

Early Dialysis and Adverse Outcomes After Hurricane Sandy

Nicole Lurie, MD, MSPH,[1] Kristen Finne, BA,[1] Chris Worrall, BS,[2] Maria Jauregui, BA,[3] Tanayott Thaweethai, BS,[3] Gregg Margolis, PhD, NREMT-P,[1] and Jeffrey Kelman, MD, MMSc[2]

Background: Hemodialysis patients have historically experienced diminished access to care and increased adverse outcomes after natural disasters. Although "early dialysis" in advance of a storm is promoted as a best practice, evidence for its effectiveness as a protective measure is lacking. Building on prior work, we examined the relationship between the receipt of dialysis ahead of schedule before the storm (also known as early dialysis) and adverse outcomes of patients with end-stage renal disease in the areas most affected by Hurricane Sandy.

Study Design: Retrospective cohort analysis, using claims data from the Centers for Medicare & Medicaid Services Datalink Project.

Setting & Participants: Patients receiving long-term hemodialysis in New York City and the state of New Jersey, the areas most affected by Hurricane Sandy.

Factor: Receipt of early dialysis compared to their usual treatment pattern in the week prior to the storm.

Outcomes: Emergency department (ED) visits, hospitalizations, and 30-day mortality following the storm.

Results: Of 13,836 study patients, 8,256 (60%) received early dialysis. In unadjusted logistic regression models, patients who received early dialysis were found to have lower odds of ED visits (OR, 0.75; 95% CI, 0.63-0.89; $P = 0.001$) and hospitalizations (OR, 0.77; 95% CI, 0.65-0.92; $P = 0.004$) in the week of the storm and similar odds of 30-day mortality (OR, 0.80; 95% CI, 0.58-1.09; $P = 0.2$). In adjusted multivariable logistic regression models, receipt of early dialysis was associated with lower odds of ED visits (OR, 0.80; 95% CI, 0.67-0.96; $P = 0.01$) and hospitalizations (OR, 0.79; 95% CI, 0.66-0.94; $P = 0.01$) in the week of the storm and 30-day mortality (OR, 0.72; 95% CI, 0.52-0.997; $P = 0.048$).

Limitations: Inability to determine which patients were offered early dialysis and declined and whether important unmeasured patient characteristics are associated with receipt of early dialysis.

Conclusions: Patients who received early dialysis had significantly lower odds of having an ED visit and hospitalization in the week of the storm and of dying within 30 days.

Evidence-Based Findings

Hurricane Sandy impacted access and resulted in **increased adverse health outcomes** for dialysis-dependent populations. Early dialysis intervention **reduces adverse health outcomes** and **saves lives**.

1. Kelman, J., Finne, K., Bogdanov, A., Worrall, C., Margolis, G., Rising, K., ... & Lurie, N. (2015). Dialysis Care and Death Following Hurricane Sandy. *American Journal of Kidney Diseases*, *65*(1), 109-115.
2. Lurie, N., Finne, K., Worrall, C., Jauregui, M., Thaweethai, T., Margolis, G., & Kelman, J. (2015). Early Dialysis and Adverse Outcomes After Hurricane Sandy. American journal of kidney diseases.

Evidence for the HHS emPOWER Program

The Pilot

In 2013, ASPR partnered with CMS and the City of New Orleans Health Department to **assess whether Medicare claims data was timely enough to rapidly identify and locate at-risk individuals** who relied on electricity-dependent oxygen equipment.[1]

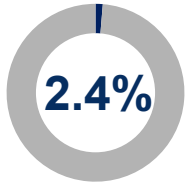
Medicare beneficiaries in the City of New Orleans with a claim for ventilator, oxygen concentrator, and/or oxygen tank.

The Results

- **611 Medicare beneficiaries** had a claim for an oxygen concentrator or ventilator, and 191 were visited
- Claims data were **93% accurate** in identifying the medical equipment*

Pilot Data Findings

Only 15 people

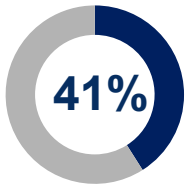


were enrolled in the city's special needs registry

Only 8 people

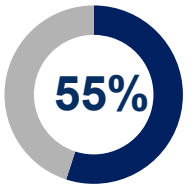
were enrolled in the electric company's registry

Almost half



did not have an emergency plan

Over half



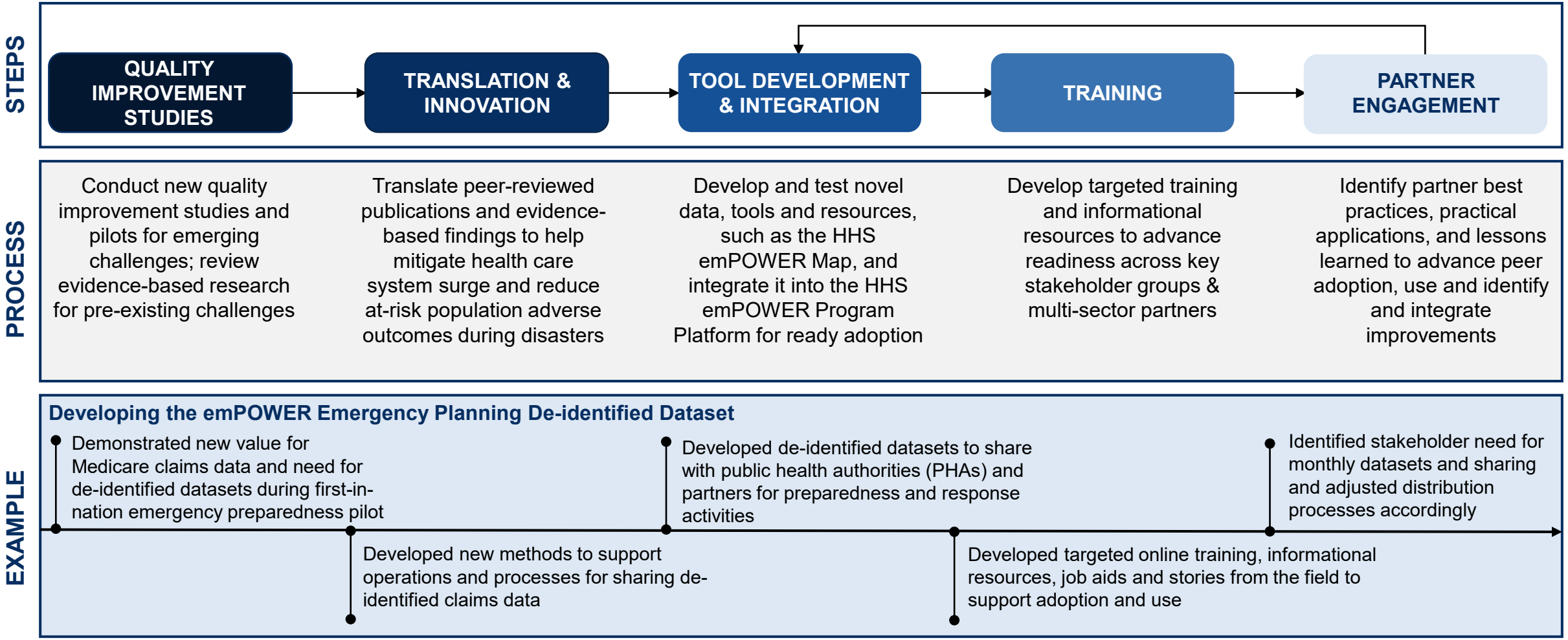
would need assistance in an emergency

*Similar results were observed in an exercise in Broome County, New York

[1]DeSalvo, K., Lurie, N., Finne, K., Worrall, C., Bogdanov, A., Dinkler, A., Kelman, J., et al. (2014). Using Medicare data to identify individuals who are electricity-dependent to improve disaster preparedness and response. *American Journal of Public Health*, 104(7), 1160-1164.

Developing Key Capabilities to Evoke Change Locally

The HHS emPOWER Program develops readily meaningful, consumable, and actionable data, tools, training, and informational resources to advance federal-to-community readiness prior to, during, and after an incident, emergency, or disaster.



HHS emPOWER Program Data and Tools

HHS emPOWER Program: emPOWERing Communities, Saving Lives

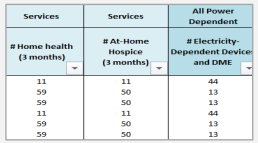
The **HHS emPOWER Program**, a partnership between ASPR and CMS provides dynamic data, geographic information systems (GIS), and artificial intelligence (AI) tools, training, informational resources, and technical assistance to help federal-to-community partners protect the health of at-risk Medicare beneficiaries who live independently, including more than 4.5 million who rely on essential health care services and/or electricity-dependent DME.

HHS emPOWER Map, **REST Service,** and **emPOWER AI**

Public

HHS emPOWER Emergency Planning Dataset

Restricted



HHS emPOWER Program Platform

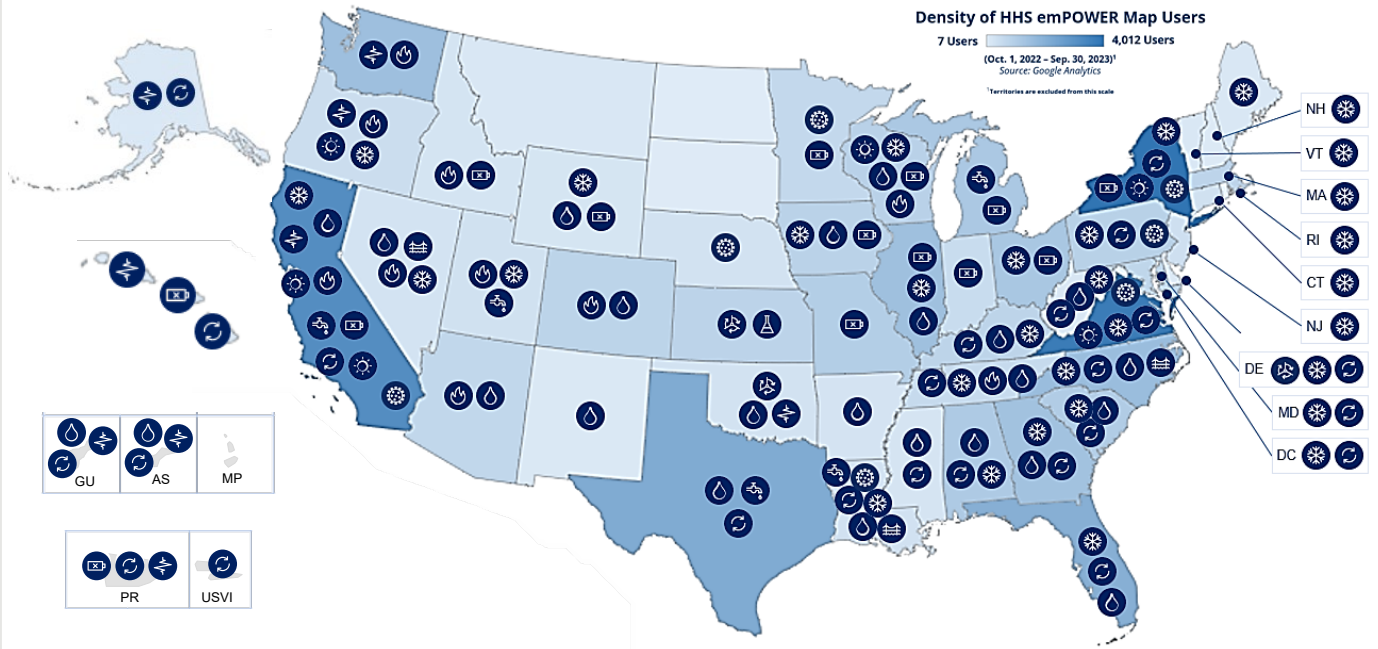
Training, Informational Resources, and Toolkits

Technical Assistance

Regional, Federal, State, Local, Tribal, and Territorial (SLTT) and Community Partners

Partners

- PHAs
- Health Care
- Emergency Management
- First Responders
- Department of Defense (DOD)
- Public Utilities, Transportation
- Human Services
- Volunteer and Community Organizations



Communities in all 50 states and 5 territories have used the HHS emPOWER Program tools to plan and support targeted responses to a variety of incidents, emergencies, and disasters:

Chemical Spill | Earthquake | Extreme Heat | Flood | Hurricane/ Tropical Storm | Infrastructure Failure | Infectious Disease | Severe Power Outage | Tornado/ Derecho | Water Emergency | Wildfire | Winter Storm

[1]Territories are excluded from this scale.

Characteristics of the HHS emPOWER Population

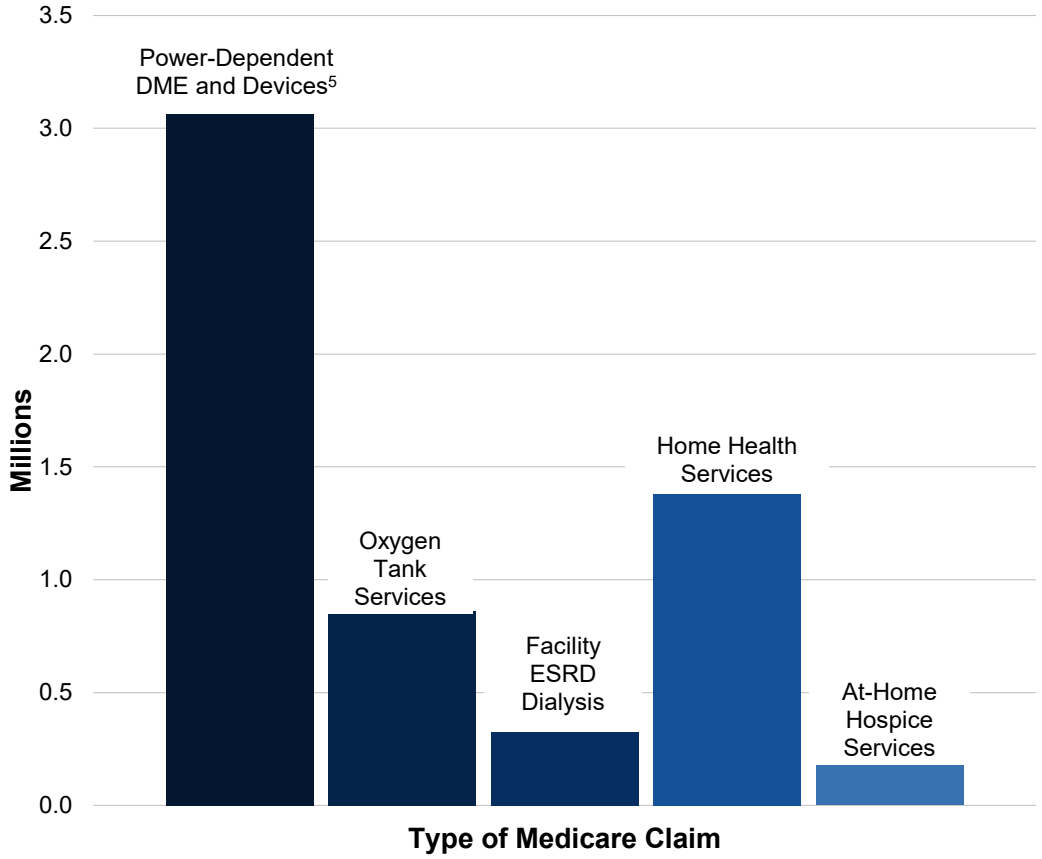
Medicare Population ~65 million[1]

- 50 states, five territories, D.C.
- 65+, or adults/children who are blind or living with a long-term disability
- 90% of dialysis-dependent ESRD population
- ~20% are also eligible for state Medicaid (dual-eligible)[2]
- ~49% of veterans report having Medicare coverage[3]

emPOWER At-Risk Population > 4.5 million

~32% of the emPOWER population is dual-eligible[2]

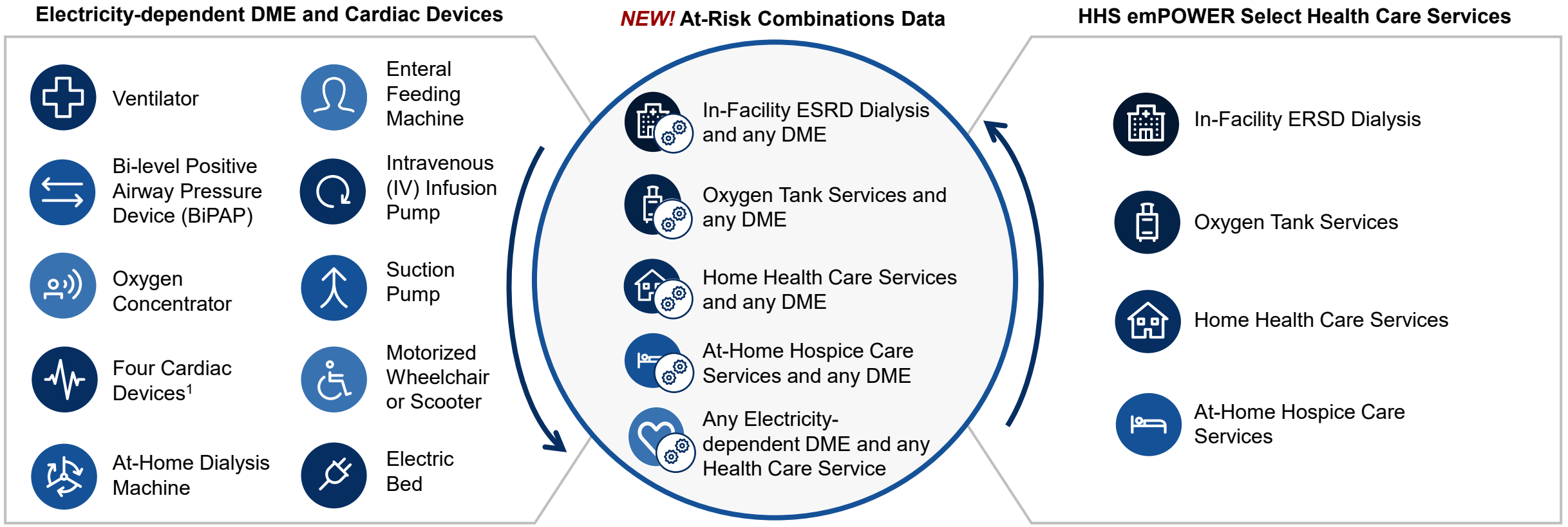
At-Risk Medicare Beneficiaries by Category (November 2023)[4]



[1] Medicare beneficiaries (Parts A and B): age 65+, regardless of income, medical history, or health status, and people <65 years old with permanent disabilities as of November 2023.
[2] As of November 2023, 31.8% of the emPOWER population is dual-eligible (beneficiary is enrolled in both a Medicare Program and a State operated Medicaid Program) as compared to 19.8% of the total Medicare population.
[3] 2022 Survey of Veteran Enrollees' Health and Use of Health Care (December 2022). ~4.1 million Veterans Administration enrollees, or ~49%, report having Medicare coverage.
[4] Medicare beneficiaries within the HHS emPOWER Program population may fall into more than one category.
[5] The total counts Medicare beneficiaries only once, even if they have more than one piece of electricity-dependent DME or device.

Medicare Data in HHS emPOWER Program Tools

The HHS emPOWER Program uses limited Medicare administrative claims data to provide the **right type of data, in the right tool, to the right person, at the right time** as outlined below:



Available on: HHS emPOWER Map, REST Service, emPOWER AI, and Emergency Planning Dataset

Available on: HHS emPOWER Map and HHS emPOWER Emergency Planning Dataset

Available on: The HHS emPOWER Map, REST Service, and Emergency Planning Dataset

[1]Includes the following four implanted cardiac devices: left, right, and bi-ventricular assistive devices (LVAD, RVAD, BIVAD) and total artificial hearts (TAH).

emPOWER Informs Community Partnerships

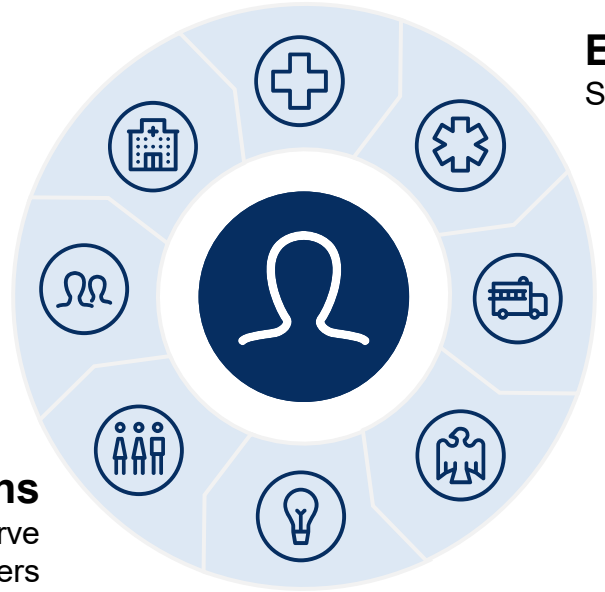
The HHS emPOWER Program provides technical assistance to help **PHAs and their partners mitigate health care system surge** and **integrate at-risk needs into national, SLTT, and community partners activities** across the emergency management cycle.

PHAs (ESF-8)
SLTT

Health Care Services & Health Information Technology
Health Care Coalitions, Providers, Suppliers, Health Information Exchanges, Electronic Health Records

Human Services
Home & Community-Based, Aging and Disability Providers

Volunteer & Community Organizations
Volunteer (e.g., American Red Cross); Medical Reserve Corps; Other Non-Traditional Partners



Emergency Management
SLTT Emergency Managers

First Responders
EMS; Fire Department; Law Enforcement; Urban Search and Rescue (USAR)

DOD
State National Guard or Reservists

Public Utilities and Transportation
Electric, Water, Sewer, and Transportation

HHS emPOWER Program in Action

Uses Throughout the Emergency Management Cycle

The suite of HHS emPOWER Program tools may be used **throughout the emergency management cycle** to help communities protect the health of community-based at-risk populations.

Mitigation

- Identify and Address All Hazards and Vulnerabilities
- Identify and Address Critical Infrastructure, Resource, and Asset Needs

Preparedness

- Enhance Population-Based Situational Awareness
- Conduct Risk Assessments and Scenario Analyses
- Conduct Emergency Planning
- Develop Response Systems, Processes, and Triggers
- Set the Stage for Life-Saving Outreach

Recovery

- Inform Reconstitution of Critical Health Care and Home and Community-Based Services
- Inform Reunification and Support Safe Return to Homes

Response

- Activate Emergency Plans
- Deploy Emergency Response Assets
- Activate Communications Networks
- Inform Decision Making for Critical Infrastructure (e.g., power, water, etc.)

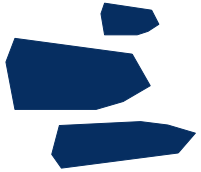
HHS emPOWER in Action

PHAs and their partners used one or more of the HHS emPOWER Program tools to accomplish the following emergency preparedness and response activities.

Enhanced Situational Awareness through Collaboration: Oregon Health Authority, in partnership with local health departments, used emPOWER data to rapidly conduct outreach and wellness visits during the 2020 historic wildfires and other severe winter storms with prolonged power outages which adversely impacted at-risk individuals.

Acquired Population-Level Situational Awareness: IL, IN, MI, MN, OH, and WI leveraged the emPOWER Emergency Planning Dataset when contributing to FEMA's multi-state regional power outage plan to help address needs at the local level in the event of a severe widespread power outage.

Developed Systems and Processes: The state of Arizona used the map and datasets to prepare for, respond to, and work to mitigate severe weather, poor air quality, and power outage threats to at-risk individuals in emergencies.



Life Saving Evacuation[1]: The U.S. Virgin Islands leveraged HHS emPOWER data to rapidly identify, locate, and conduct life-saving evacuations for 235 dialysis-dependent individuals on St. Thomas and St. Croix to ensure continuity of care in the aftermath of Hurricanes Irma and Maria.

Coordinated Response Efforts: Tennessee Department of Health used HHS emPOWER data to assist the Army National Guard in conducting life-saving outreach to over 70 oxygen dependent at-risk individuals during severe wildfires.

Conducted Targeted Rural Outreach: Goshen County and the Wyoming Department of Health used HHS emPOWER data to support multi-agency response outreach activities, conducting phone-based and physical wellness checks for at-risk individuals during back-to-back severe blizzards with high winds and freezing conditions.

Identified Resource Gaps: Los Angeles (LA) County, CA, used emPOWER data and tools innovatively to inform multi-agency training and exercises to protect the health of over 100,000 at-risk community members through wildfires, power outages, flooding and mudslides, and water quality emergencies.

Set the Stage for Life-Saving Assistance: Nevada's state and county health departments leveraged the datasets to partner with the Aging and Disability Services Division, a Tribe Emergency Manager, DME suppliers, and others to conduct outreach during prolonged severe flooding events.

Activated Emergency Communication Networks: Florida Department of Health used HHS emPOWER data to conduct life-saving outreach to over 40,000 at-risk residents during Hurricane Matthew.

[1]Avilés Mendoza, G.J., Finne, K.P., Torre Leon, F. et al. Observations from the emergency management of dialysis patients evacuated from the US Virgin Islands to Puerto Rico following hurricane Irma. BMC Health Serv Res 21, 1239 (2021).

Use Case: Hurricane Irma in U.S. Virgin Islands

HHS emPOWER Program tools helped the U.S. Virgin Islands[1] **identify and locate individuals dependent on dialysis** for life-saving outreach and evacuation.

Preparedness

In 2017, ASPR, CMS, and territorial public health officials used HHS emPOWER datasets to **identify health care and resource gaps for dialysis patients and develop a plan** with ESRD networks and dialysis providers to ensure continuity of their life-maintaining health care services.

Response

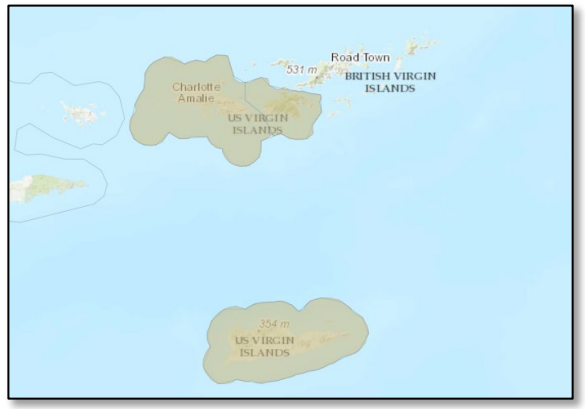
Following Hurricanes Irma and Maria, ASPR used HHS emPOWER data to **rapidly identify, locate, and conduct life-saving evacuations** of dialysis patients via ASPR National Disaster Medical System, United States Public Health Service (USPHS), Federal Emergency Management Agency (FEMA), USAR, and DOD.

Impact

ASPR developed best practices to assist others in understanding how emPOWER data can help inform and protect the lives of at-risk individuals in disasters.

Supporting partners:

- ASPR
- CMS
- Dialysis Providers
- ESRD Networks
- FEMA
- DOD
- USPHS
- USAR



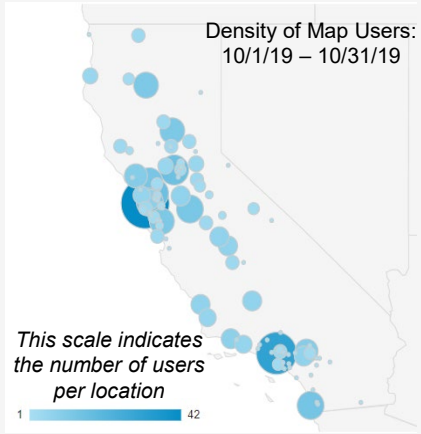
235

life-saving evacuations of dialysis-dependent individuals from St. Thomas and St. Croix to ensure continuity of care

[1]Avilés Mendoza, G.J., Finne, K.P., Torre Leon, F. et al. Observations from the emergency management of dialysis patients evacuated from the US Virgin Islands to Puerto Rico following hurricane Irma. BMC Health Serv Res 21, 1239 (2021).

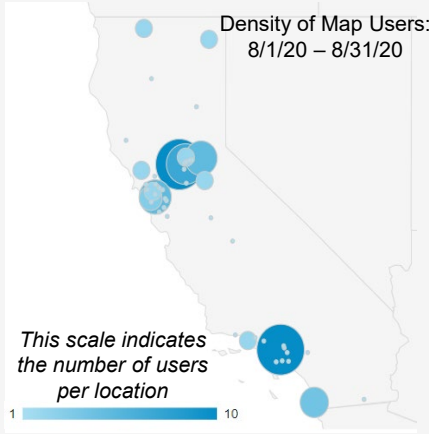
HHS emPOWER Map and Platform Use from 2019-2022: Examples of Wildfire and Public Safety Power Shutoffs in California

October 2019



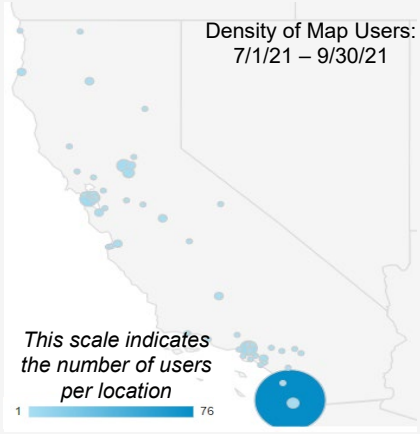
- **Kincade Fire** in Sonoma County, the largest fire of the year, burned **77,758 acres**
- **800,000 electric customers** impacted by power shutoffs
- **435 users** accessed the HHS emPOWER Map

August 2020



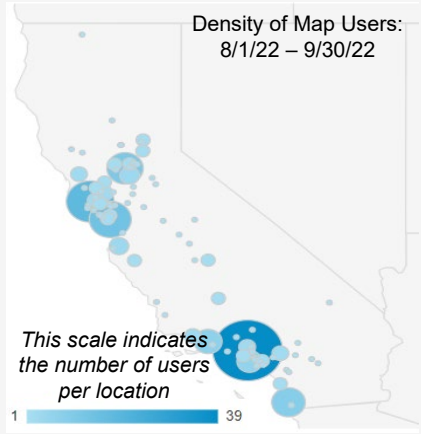
- Largest wildfire season recorded in California's modern history
- August Complex fire, the first "gigafire" **burned 1+ million acres**
- **92 users** accessed the HHS emPOWER Map

July – September 2021*



- **2.5+ million acres** burned:
  - In July, **more than 3x** as many acres burned compared to 2020
  - In August, multiple fires erupted across central CA
- **297 users** accessed the HHS emPOWER Map
- **499 users** accessed the HHS emPOWER Program Platform*
- **71 informational resource downloads** from the HHS emPOWER Program Platform*

August – September 2022*



- Total acreage burned in 2022 was **less than 400,000** vs. the five-year average of **2.5 million+ acres**; still, **multiple fires** burned in 2022 across northern CA
- **124 users** accessed the HHS emPOWER Map
- **224 users** accessed the HHS emPOWER Program Platform*
- **43 informational resource downloads** from the HHS emPOWER Program Platform*

Source: https://www.fire.ca.gov/incidents and HHS emPOWER Program Platform Google Analytics
*In 2021, the HHS emPOWER Program Platform was launched with data tracking available in Google Analytics

HHS emPOWER Map and Dataset Use Supported Response Across the Nation During 2022-2023 Winter Storms

December 21, 2022 – December 26, 2022

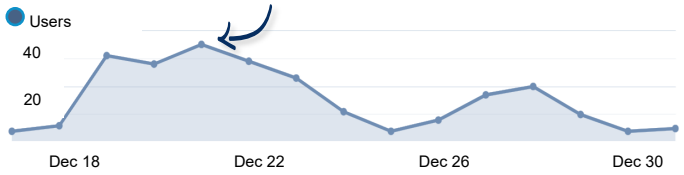
From December 2022 to March 2023, **historic winter storms** swept across the nation resulting in:

- Severe blizzard conditions
- Freezing temperatures
- Strong wind gusts leading to prolonged power outages/shutoffs
- **60 million** people under winter weather alerts[1]
- **1 million** homes and businesses without power[1]

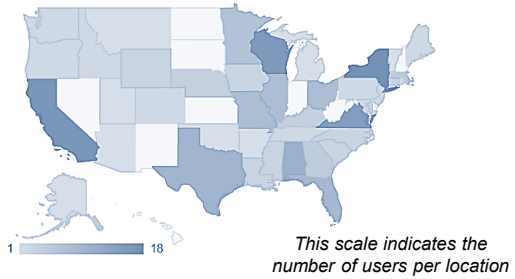
Source: The Washington Post, CNN

From December 21 – 26, 2022, HHS emPOWER Map usage **peaked on December 21,** a few days before the height of the winter storm on December 25.

In the two weeks surrounding the holiday winter storm, **195 users accessed the HHS emPOWER Map** and **requested HHS emPOWER datasets** to inform their emergency response activities.



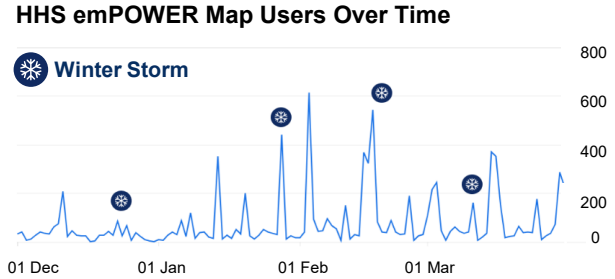
Density of emPOWER Map Users: 12/17/22 – 12/31/22
Source: HHS emPOWER Program Platform Google Analytics

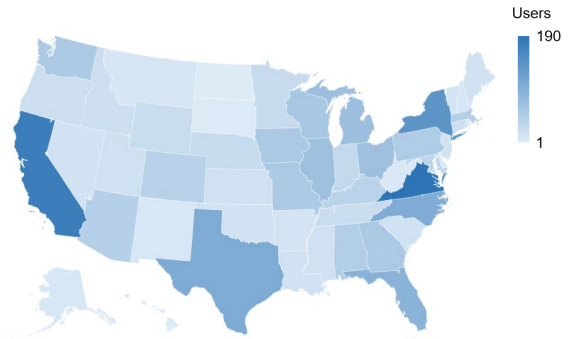


Density of emPOWER Map Users: 12/17/22 – 12/31/22
Source: HHS emPOWER Program Platform Google Analytics

December 2022 – March 2023

Winter storms continued to impact the country into March 2023, and **over 2,000 users accessed the HHS emPOWER Map** and PHAs continued to **request emPOWER datasets** to protect at-risk populations in their communities.



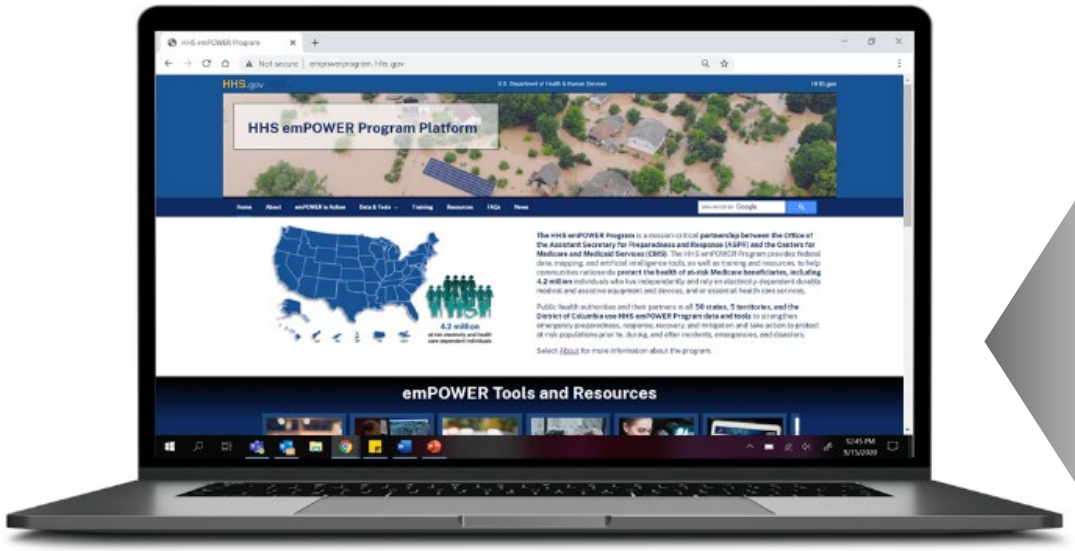


Density of emPOWER Map Users: 12/1/22 – 3/31/23
Source: HHS emPOWER Program Platform Google Analytics

HHS emPOWER Program Platform and Resources

HHS emPOWER Program Platform

The HHS emPOWER Program Platform is a mobile-ready technical assistance platform designed for public health, health care, and emergency management organizations, first responders, power companies, and other partners. The platform provides emPOWER data, tools, training, and informational resources to help partners anticipate, plan for, and respond to incidents, emergencies, and disasters in their communities.



Use your smartphone camera to scan this QR code and access the HHS emPOWER Program Platform

The Platform features multiple pages, including:

- **About:** Learn about the history and impact of emPOWER;
- **emPOWER in Action:** Learn about practical applications of the data for emergency planning and real-world responses in a featured map, and read Stories from the Field to see how emPOWER data and tools have made an impact in communities across the nation;
- **Trainings:** Learn more about the practical applications in real-world response through interactive, web-based trainings;
- **Resources:** Find fact sheets, job aids, quick reference resources, and more tools that have been and will continue to be developed with partners' unique needs in mind;
- **FAQs:** Find answers to common questions about the program and its suite of data and mapping tools;
- **And more!**

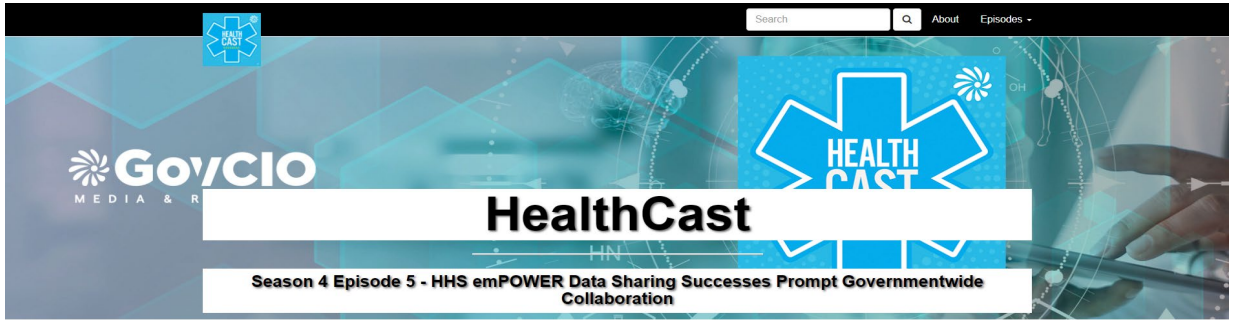
HHS emPOWER Program Evidence-Based Publications and Resources

The HHS emPOWER Program continues to expand evidence-bases through peer-reviewed publications to help states, territories, and localities improve continuity of care and health outcomes for millions of at-risk individuals prior to, during, and after an incident, emergency, or disaster.

emPOWER Peer-Reviewed Publications

GOVCIO HealthCast Two-Part Podcast Series

[Part 1: HHS Program emPOWERs Patients Who Depend on Electrical Devices During, After Natural Disasters.]



[Part 2: HHS emPOWER Data Sharing Successes Prompt Governmentwide Collaboration]

Summary of HHS emPOWER Program Use Case Elements

HHS emPOWER Program Community Use Case Summary

The HHS emPOWER Program aims to address severe surges in health care demand and stress on health care systems that commonly leads to increases in adverse health outcomes for at-risk individuals impacted by an event.

DISCUSSION OVERVIEW	DESCRIPTION
Use Case – Defining Question	How do we reduce health care and response system surge and better support access, utilization and continuity of care for at-risk individuals prior to, during, and after an incident, emergency, or disaster?
Ultimate Goal	Use CMS and other data sources to reduce adverse health outcomes for electricity-dependent DME and health care service dependent at-risk individuals and health care system surge.
Primary Problems	Limited to no data available and or access, disclosure requirements and agreements, lack of translation into beginner to advanced maps, tools and visualizations to use, informational resources, and technical assistance and training requirements to support adoption and use.
Disaster Cycle Phases	Preparedness, Response, Recovery, Mitigation, and Resilience.
Data Sources	CMS, Medicare Program administrative claims data.
Barriers	Data limitations, data access and potential disclosure requirements, limited tools and ability to integrate into existing tools, and no informational resources, technical assistance and training availability.
Solutions	A program with federal data, mapping, AI tools, GIS, and training and resources to help communities nationwide protect the health of at-risk individuals.
Implications	Advancing population and health system outcomes for national health security through mission-critical data, tools, resources, and training capabilities that support diverse partners from federal to the community level.

Questions?

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