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SURVIVING IN PLACE: BATTERY BACKUP SUPPLY PROGRAM

Summative Program Evaluation Report



The Evaluation Center

UNIVERSITY OF COLORADO
DENVER | ANSCHUTZ MEDICAL CAMPUS



Table of Contents

EXECUTIVE SUMMARY	1
BACKGROUND	2
Evaluation Methods	2
Surveys	2
Focus Groups	3
PROGRAM PARTICIPANTS	3
Vignettes	3
Adult recipient – “Paul”	3
Parent & Son Recipient – “Elijah”/”Barbara”	4
Participant Characteristics	5
Demographics.....	6
Geographic Location	8
PROGRAM EVALUATION FINDINGS.....	10
Baseline Survey Results.....	10
6 Month Follow Up Survey Results	11
Program Benefits	12
Program Satisfaction	14
Suggestions for Improvement	16
RECOMMENDATIONS.....	18

EXECUTIVE SUMMARY

Since 2023, the Backup Power Supply Program has served over 1,400 Medicaid recipients across the state of Colorado, including rural and frontier counties. Applications were received from 55 of 64 Colorado counties. Backup batteries were distributed to individuals, families, and caretakers across 49 Colorado counties.



Nearly half (45%) of applicants intended to use their battery to power **two or more medical devices**. The most common types of medical devices were oxygen concentrator machines, Continuous Positive Airway Pressure/Bilevel Positive Airway Pressure (CPAP/BIPAP) machines, nebulizer machines, refrigeration for medication, and equipment monitors.



94% were satisfied with the program and would recommend it to a friend or colleague. Nearly 400 participants replied with open-ended feedback expressing gratitude for the program, describing the easy the application process, and noting the equipment they received was of excellent quality.



Recipients reported they were **better prepared for emergencies**. Only 40% of respondents reported they had developed an emergency plan before program participation compared to 87% after receiving the backup battery.



88% would recommend the program to a friend or colleague. Participants reported multiple benefits of having a backup battery in their home including feeling less stress and worry about emergencies, being better prepared for power outages, and feeling more confident to remain at home during emergencies.



98% who used the backup battery during a power outage remained in their homes instead of finding alternative accommodations.

Survey respondents provided a few suggestions to improve the program such as providing further assistance with equipment set up and operation, providing a solar panel, and more communication regarding equipment delivery.

BACKGROUND

The Colorado Department of Health Care Policy and Financing (HCPF) provided funding for several emergency preparedness pilot programs for Medicaid recipients who depend on life-saving medical equipment or devices. Partnering with the Center for Inclusive Design (CIDE) at the University of Colorado Anschutz Medical Campus, the Surviving in Place (SIP): Battery Backup Supply Program equips participants with emergency batteries to keep their vital devices active during unexpected power failures.

Home and Community-Based Service (HCBS) providers have collaborated with CIDE to develop and provide training to Medicaid recipients on how to use these backup power systems and develop individual emergency and disaster plans. An online application system was developed and launched in the summer of 2023. Applications were reviewed and approved by the SIP Program Manager. To date, **over 1,400 individuals or caregivers** have received a backup battery through the SIP program.

Battery Backup Participants

1,412

Received batteries

731

Individuals completed a baseline evaluation survey

EVALUATION METHODS

SURVEYS

Evaluators worked with CIDE leaders to develop two evaluation surveys to assess program participants' level of preparedness for emergencies, ease of set up and utilization of backup batteries, and overall program satisfaction. A baseline survey was sent quarterly throughout the program's existence, which spanned August 2023 through September 2024. Surveys were sent to 1,354 battery recipients, and 731 individuals completed the survey, resulting in a response rate of 54%. In many cases, a family member, caretaker, or case worker submitted the program application on behalf of the Medicaid recipient. Because many questions were specific to the backup power system recipient, not all respondents answered all questions.

A follow-up survey was also developed to assess the program's impact on participants who had a backup power supply for at least six months. The survey was distributed on July 17, 2024, and closed on July 30, 2024. Of the 1,004 individuals who received a battery through the SIP program at that time, 575 had their battery for at least six months when the survey was sent. All 575 were

invited to participate, and 255 responded, resulting in a 44% response rate. At the time of the survey, respondents report having their batteries for 6 to 11 months.

FOCUS GROUPS

Evaluators conducted two one-hour long focus groups on May 8 and May 16, 2024. There were a total of seven individuals who participated in the focus groups. Three participants were applicants who had applied to the program on their own behalf, three were parents who had applied on behalf of their children, and one adult son participated along with his mother. Focus group participants gave verbal consent to participate and received a \$25 Amazon e-gift card for their participation. The focus groups were conducted via Zoom and an audio transcript was generated afterwards.

Focus group participants represented different Colorado regions and applicant types. Of the seven focus group participants, four represented urban counties in the Denver metropolitan area (Adams, Arapaho, Jefferson Counties) and Weld County. Three participants represented rural Colorado (Grand and Park Counties). Evaluators identified the main themes that emerged from the focus groups and summarized program strengths and several areas for program improvement. Finally, two vignettes were developed from focus group participants' stories to describe the experiences of program participants.

PROGRAM PARTICIPANTS

VIGNETTES

ADULT RECIPIENT - "PAUL"

Paul is 56-year-old and lives in an apartment in Northern Colorado. He is paraplegic and has used a wheelchair for over 30 years. He uses an electronic lift to access his van in the garage which he drives to work. He has experienced multiple power outages. The instances most worrisome for him are during cold winter nights. He described how he's struggled to deal with power outages in the past, staying in the living room all night with the stove running to keep warm. In another instance, Paul called the fire department after he got stuck on the lift because the lift doesn't operate well when the temperature drops below zero degrees.

Paul learned about the backup battery program from his Medicaid social worker. He described how easy the battery setup was,

"I had my neighbor help me bring it in and pretty much set the battery up myself. I put my battery on a little stand that has wheels on it so I can push it around to different destinations in my house that I might be able to use it. I feel now if we do have a bad

winter or the lights go out due to the wind ..., I don't have any fear. I feel like I can make it to the next day."

He has already used the backup battery several times, using it to power the electronic lift, his refrigerator, and a small electric heater during a power outage. These experiences have reduced his level of stress; Paul described "a big fear that's lifted off your shoulders. It's a big relief in having not to worry about that."

Paul described the financial benefits of the backup battery program noting, "If I had to buy this battery for myself, I think this battery was almost like a thousand dollars. And there is no way I can afford it." He is grateful for the program saying, "I want to give my feedback so we can bless the process for other people. I am totally 100% satisfied and blessed." When Paul is not using the battery, he always keeps it charged. He described the peace of mind that comes with knowing you have a backup power source. Paul also described his level of independence as "through the roof" these days. He is even thinking about taking the battery on the road for a summer trip and to be able to do more activities with his grandchildren.

PARENT & SON RECIPIENT - "ELIJAH"/"BARBARA"

Barbara is a mother and primary caregiver for her son Elijah who is 37 years old and has cerebral palsy and relies on an oxygen concentrator and a power wheelchair. Barbara learned about the program through an email from a case management agency and applied to the program on Elijah's behalf. Elijah lives independently in a condominium in Denver four days a week, and then spends three days a week with his parents in a mountain town at 7,700 feet elevation. Due to more frequent power outages in the mountains, the family chose to place the backup battery in their mountain cabin, which Barbara describes as Elijah's "happy place."

Barbara has worked with an emergency preparedness counselor in the past and knew she needed a backup power system in a mountain home. She described how they have had several power outages at their cabin, though "fortunately not during the middle of the night." During the daytime power outages, they've been able to test different ways to use the new backup battery. Barbara described purchasing a solar power charging panel to charge the battery in the event of a longer outage. They tested the solar charging panel and found that it was easy to use to charge the battery. With the new equipment and practice sessions, she described feeling more comfortable, "I'm not hyper ventilating when the storms and wind start coming."

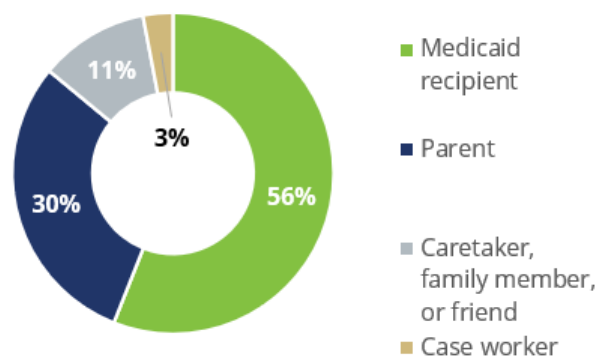
Barbara described not being able to afford the backup battery unit they received,

"There's no way I would have had the money to buy a battery backup system of that quality. That would not have risen to the top of our purchasing choices. We wouldn't have the funds to do so. Yeah, it would mean taking resources from something else. I would say there was a huge financial benefit. I am very grateful."

PARTICIPANT CHARACTERISTICS

There were four types of program applicants: 1) adults completing the application on their own, 2) parents applying on behalf of their minor children, 3) caretakers or family members applying for an adult in their care, and 4) case workers applying on behalf of their Medicaid clients. About half of the survey respondents (47%) filled out the application themselves while nearly one-third (30%) were parents who applied on behalf of a child (Exhibit 1).

Exhibit 1. Applicant type (n=728)



According to application data, over half of the recipients intended to use their battery for at least one medical device, and about one in five planned to use it for three or more devices (Exhibit 2).

Exhibit 2. How many medical devices recipients intended to power with their battery (n=1,378)



55% Intended to power 1 device



26% Intended to power 2 devices

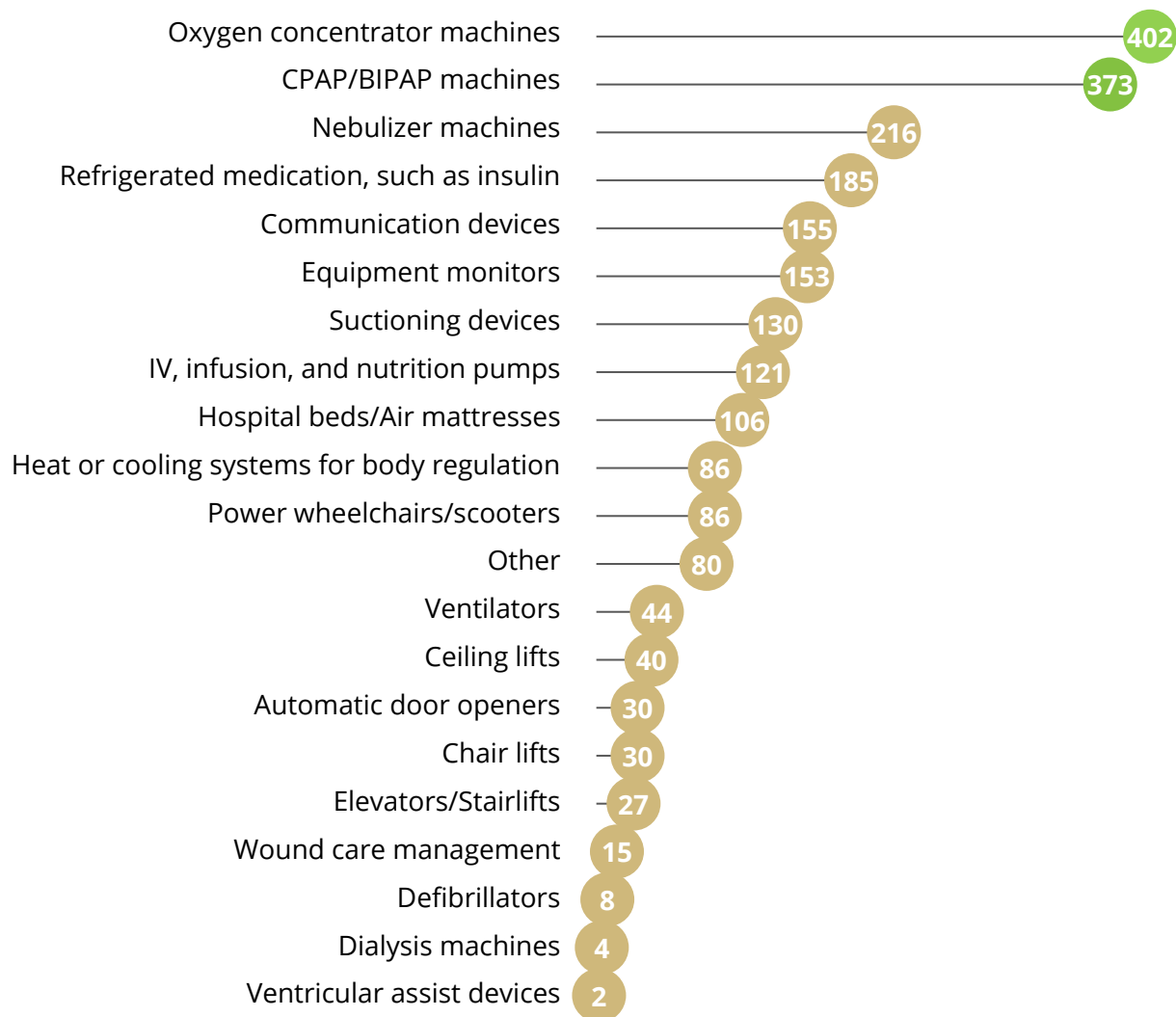


19% Intended to power 3 or more devices

Respondents reported a wide array of medical equipment and devices they intended to use with the backup power supply (Exhibit 3). There were 2,293 selections made by the 728 respondents, indicating that many intended to utilize the backup battery for more than one device. The most common types of medical equipment were oxygen concentrator machines and Continuous Positive Airway Pressure/Bilevel Positive Airway Pressure (CPAP/BIPAP) machines. Eighty respondents selected "other," and these devices were identified as airway clearance machines, trach collar heart monitors, Continuous Glucose Monitoring (CGM) and insulin pumps, airway clearance system (CPT) vests, abdominal massagers, lymphedema pumps, high-flow machines, pulse oximeter, spinal cord

stimulator implant, seizure monitors, feeding pumps, leg circulation pumps, spinal cord stimulator implants, electric stander, and cough assist machines.

Exhibit 3. Type of equipment or device in need of a backup power supply (n=728)



DEMOGRAPHICS

The program served individuals across the age spectrum. Over half of recipients (58%) were adults (age 25-44) or middle-aged (age 45-64). Nearly one in five (18%) of the recipients were infants (age 0-4) and children (age 5-14). About 16% of program recipients were seniors over the age of 65.

Exhibit 4. Program recipients age distribution (n=1,405)

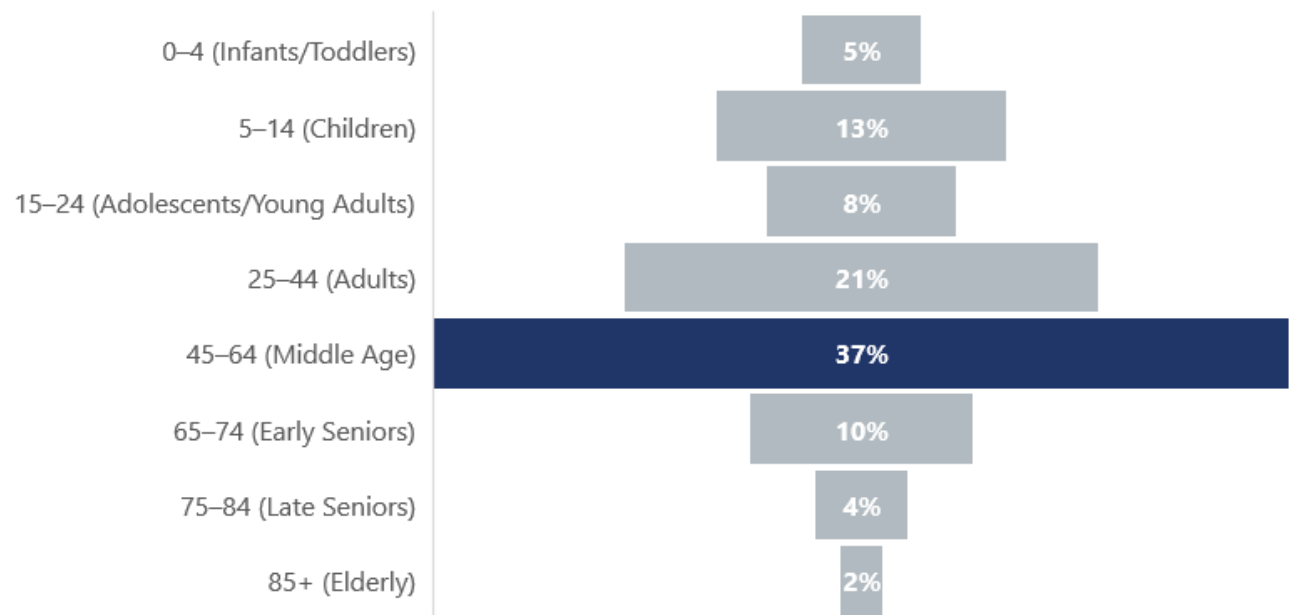
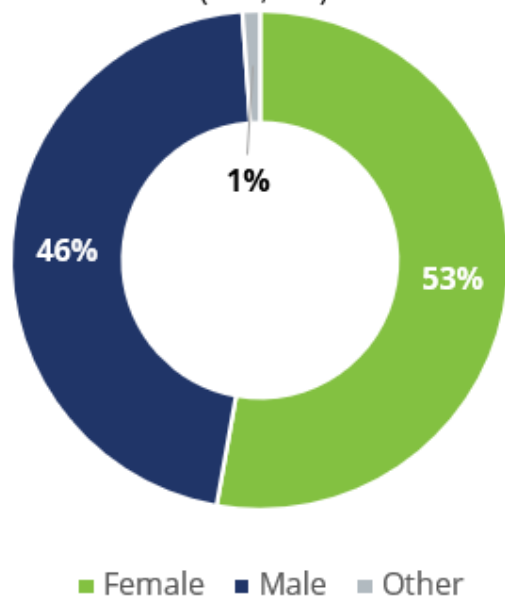
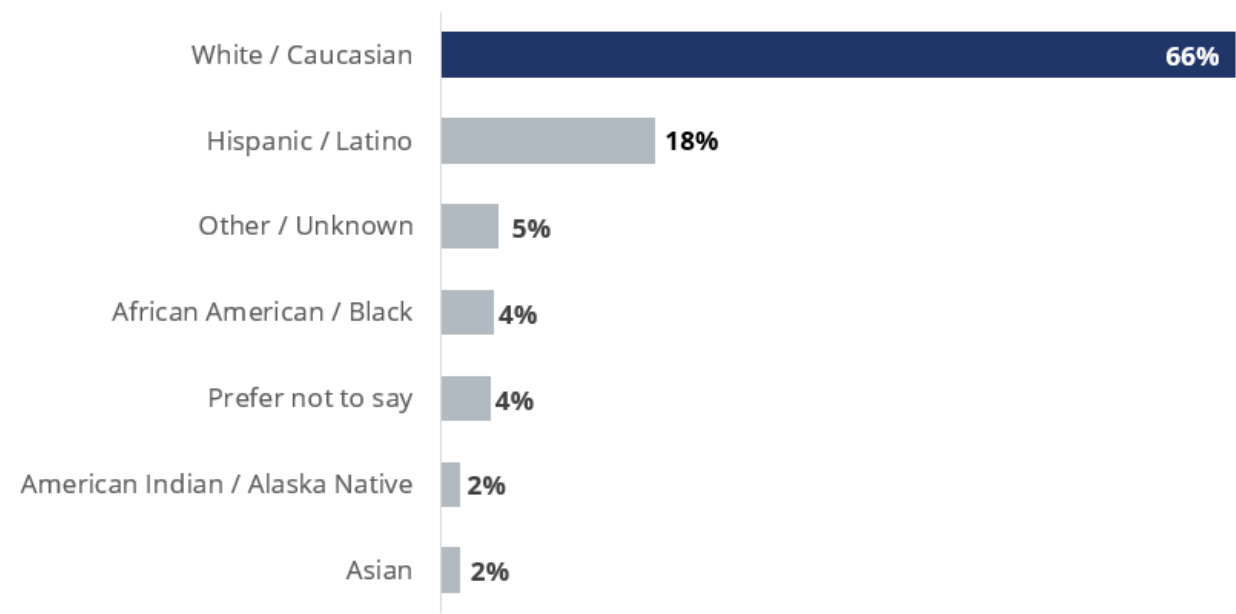


Exhibit 5. Program recipients' gender (n=1,405)



Slightly over half of the battery recipients identified as female (Exhibit 5). Two-thirds of battery recipients identified as White or Caucasian, and about one in five identified as Hispanic or Latino/a (Exhibit 6). Four percent identified as African American or Black, 2% as American Indian or Alaskan Native, and 2% as Asian.

Exhibit 6. Program recipients racial and ethnic identification (n=1,405)



GEOGRAPHIC LOCATION

Almost half of the battery recipients lived between 5,000 and 6,000 feet above sea level, while 20% lived between 6,000' and 7,000', and 20% lived between 4,000' and 5,000'.

Exhibit 7. The elevation of the recipient's residence (n=1,308)

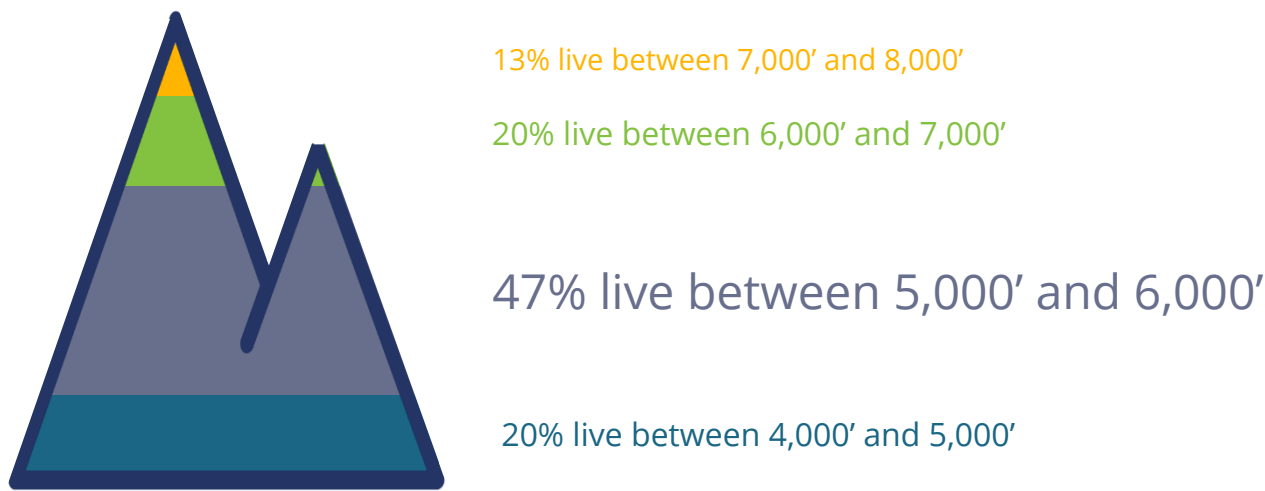
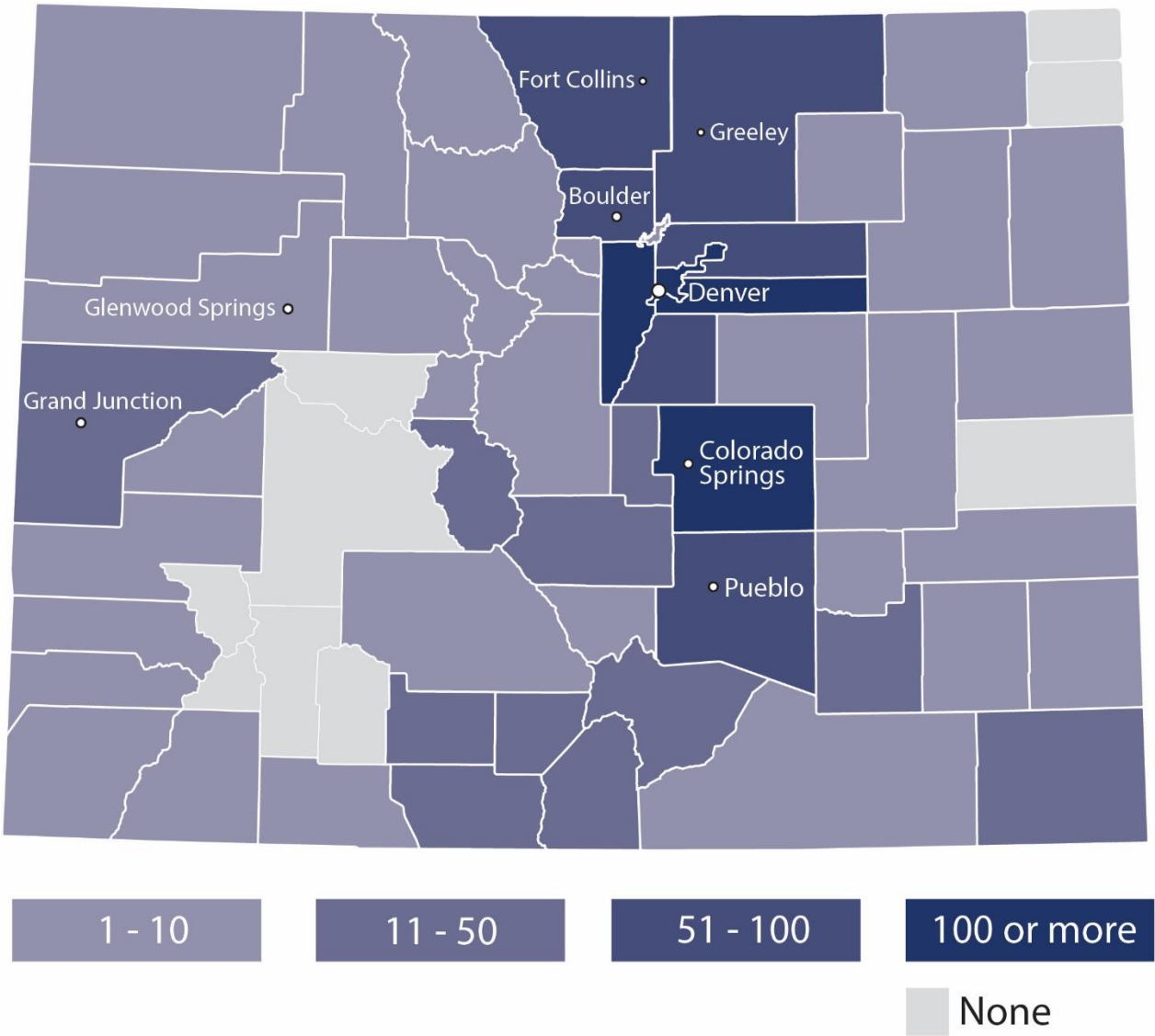


Exhibit 8 displays a map of Colorado that shows the locations of battery recipients, demonstrating the expansive statewide reach of the backup power supply program. Applicants represent 55 of 64 Colorado counties. The counties with the most participants were along the Front Range in Denver, El Paso, Jefferson, Adams, and Arapahoe Counties.

Exhibit 8. Number of program recipients per county (n=1,412)

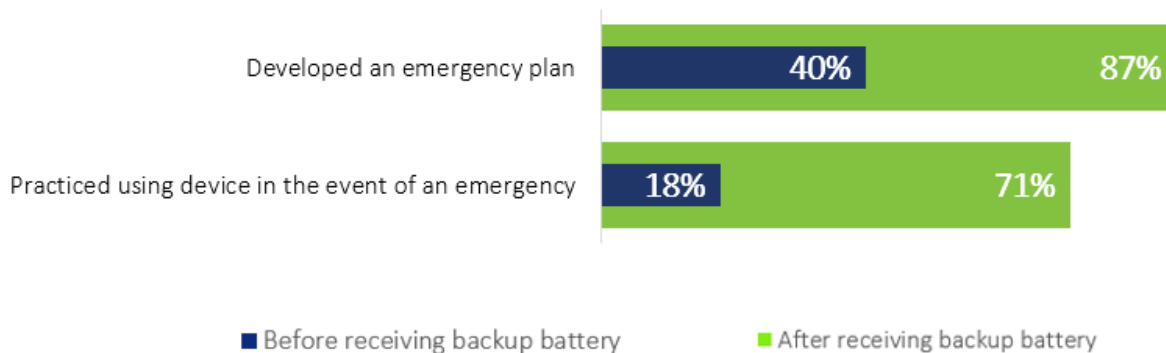


Program Evaluation Findings

BASELINE SURVEY RESULTS

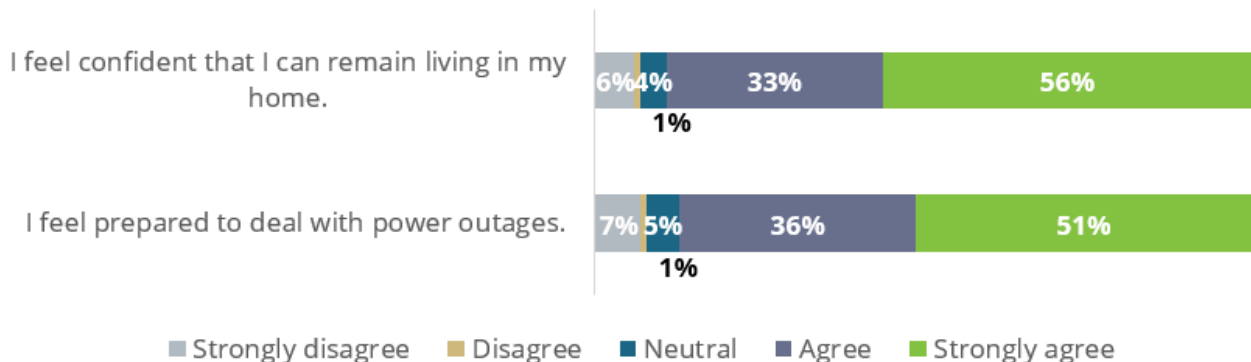
Respondents reported that receiving backup batteries helped them better prepare for emergencies. For example, only 40% of respondents reported they had developed an emergency plan beforehand, compared to 87% after receiving the backup battery. In addition, only 18% of respondents had practiced using their device in the event of an emergency before receiving the backup power supply, compared to 71% after receiving the battery.

Exhibit 9. Development of emergency plans and preparedness (n=576)



In addition, about 89% of respondents “agreed” or “strongly agreed” that they were confident that they could remain living at home, and 87% felt prepared to deal with power outages.

Exhibit 10. Perception of confidence and preparedness in the event of an emergency (n=694)



6 MONTH FOLLOW UP SURVEY RESULTS

Of those who used their batteries during an outage, almost half had used it two or three times, while 30% had used it only once (Exhibit 11). These respondents said that the longest duration that their battery was used continuously was mostly 1 to 3 hours or 4 to 7 hours (Exhibit 12). The majority of respondents who used their battery during an outage reported that the battery reliably powered all of their medical devices “always” or “most of the time” (Exhibit 13).

Exhibit 11. How often the backup batteries were used in the last 6 months (n=137)

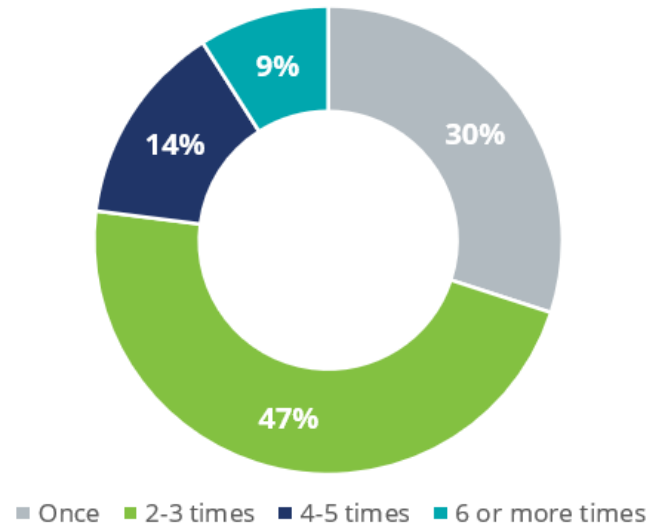


Exhibit 12. The longest duration the battery was used continuously (n=137)

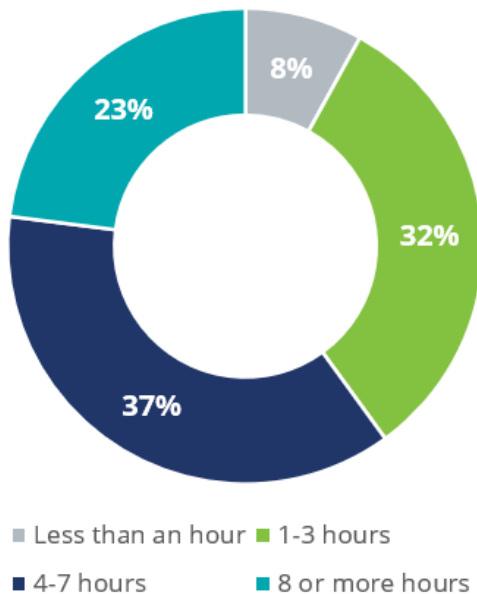
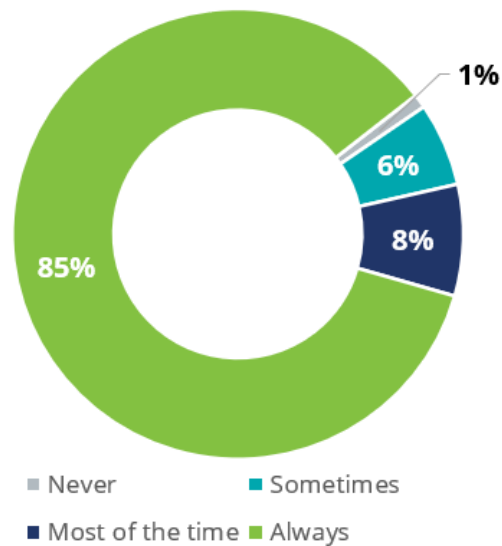


Exhibit 13. How often did the battery reliably power all medical equipment during an outage (n=137)



Of the 138 respondents who used their batteries during a power outage, 98% remained in their homes instead of finding alternative accommodation because they had a backup power supply. Three individuals noted that they had to leave their homes during a power outage because the backup power supply did not have enough power to last the entire outage. One recipient said,

“The backup power bank was not large enough for my needs. After charging the wheelchair assist and fridge, I ran out of power quickly, and other devices, including emergency contact wearable buttons and other devices, could not be used. I just need a larger unit or a second add-on battery for my unit.”

A quarter of respondents said they used their battery outside the home for things like camping or traveling (Exhibit 14). Nearly all (95%) respondents indicated that their backup power supply was plugged in, charged, and ready for an emergency at the time of the survey. In addition, nearly all respondents (97%) noted that their battery performed as well as it did when they first received it. However, some respondents noted having issues with the battery and could not solve them because they did not have the necessary warranty information for the battery.

Exhibit 14. Percentage of respondents who used their battery outside of the home (camping, traveling, etc.) (n=237)



PROGRAM BENEFITS

Participants noted many benefits of now owning a backup battery supply. Multiple themes were identified from focus group participants and the open-ended feedback provided by survey respondents. Participants cited the following benefits most frequently: 1) feeling less stress and worry, 2) being better prepared for power outages and emergencies in general, and 3) remaining at home during emergencies. Examples from participants for each theme are provided below.

Exhibit 15. Backup Power Supply Program Benefits

Theme	Selected Responses
“Peace of mind” /less stress and worry	• This unit has already saved me three times since its arrival due to extreme power outages, which happen frequently out here. It has provided me with unexplainable peace of mind as I am very reliant on my oxygen regenerator. Thank you!!! • It gives me peace of mind, and I’ll be able to breathe while sleeping in case of an emergency power outage. • This system has given me peace of mind. As the mother of a terminal child, ensuring all of her needs are being met is my number one priority. I depend heavily on several machines

that require electricity to function and keep my daughter safe at home with her family, and this allows me to do that when the power goes out. It also is allowing us to take my daughter out into nature more. Who doesn't need sunshine and fresh air? We aren't confined to the home outlet anymore. That in itself means the world to us."

- I used to stress about losing power and not having enough battery backup for all of his devices, but I now have peace of mind.
- This gives me a peace of mind that all of my life-sustaining and mobility devices will continue to operate straight through a power outage.
- It takes the stress out of wondering what would happen if there was a power outage. Having the backup provides peace of mind and less stress.
- Having the equipment that enables me to use all my devices in the event of a power outage has eliminated the stress and anxiety I felt each time there was a weather event, including high winds, thunderstorms and snowstorms. The backup power system has taken a tremendous burden off of me. THANK YOU SO MUCH FOR MAKING MY LIFE LESS STRESSFUL!!!

Better prepared for emergencies

- I have all sorts of "preps," including food, a propane heater, and an alcohol cook stove. I've been stumped on a backup power source, especially for charging my son's wheelchair and using his concentrator because of the high cost of the backup battery system. Receiving the battery system has been a blessing, and I'm sure I can handle any extended power outage.
- I have chronic sleep apnea, and my sister is on oxygen. We live together and are elderly. The battery backup system makes us feel so much better and prepared in the event of power outages. The system is so nice and easy to use. THANK YOU!
- Having a battery backup system makes me feel like I can handle an outage emergency better. I feel less stressed that I will have my medical devices available during an outage.
- Provides psychological reassurance and emergency plan flexibility especially concerning my caregiver and my individual readiness and safety.
- Peace of mind knowing we will not have to leave our home to find power to operate our child's medical devices.

Remain living at home during power outages

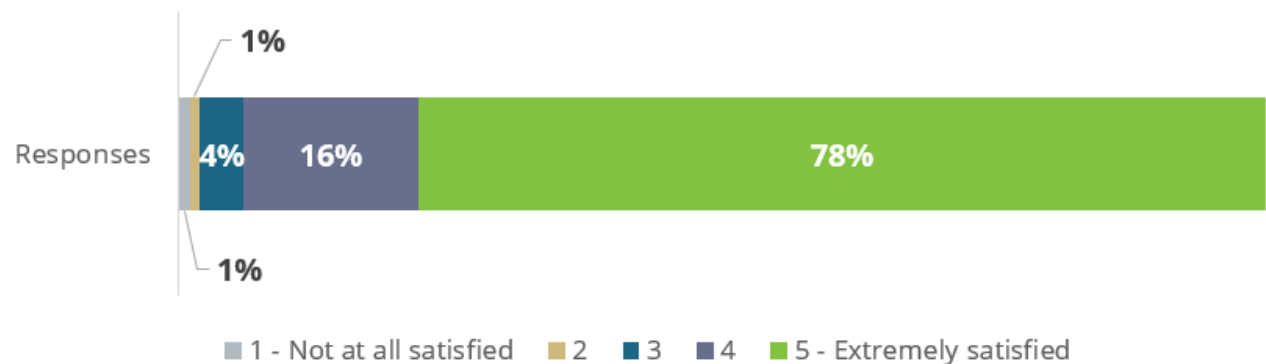
- Getting this system has ensured that if the power goes out, I will be able to stay in my own place until the power is restored. This is very helpful as I don't drive, I don't have a car, and I'm on a limited income and couldn't afford a Lyft/Uber and a hotel/motel.
- Gives some peace of mind that we can stay in place for a moderate power outage that doesn't last too long.
- We are really grateful; we heard from another family on our county road that used this program that they are easily able to continue caring for their son in an outage. Having the generator is the difference between needing to evacuate to a hospital and being able to remain home. We know if the power goes out we are covered and can meet our son's needs.
- Less worry about leaving the state due to an emergency. We can now stay home.
- I feel if the power ever goes out we won't have to leave the home to find a place that has power.

PROGRAM SATISFACTION

Program participants reported very high satisfaction with the program, with 94% of respondents reporting satisfaction with the program, while only 2% reported dissatisfaction.

“This is a wonderful program for people who are reliant on power to live comfortably at home during power grid issues. We are very grateful for this program!”

Exhibit 16. Satisfaction with backup power supply program (n=683)



Most respondents reported they would recommend the Backup Battery Supply Program to a friend or colleague. Using an eleven-point scale (0 = not at all likely to 10 = extremely likely), respondents were asked to indicate the degree to which they would recommend the Backup Power Supply Program to others. The Net Promoter Score (NPS) serves as a metric to measure customer loyalty and satisfaction by asking individuals how likely they are to recommend a company’s product or service to others. Based on their response, respondents fell into one of three categories to establish a net promotor score, as shown below. The majority (88%) of respondents are considered program promoters who would recommend the program to others.

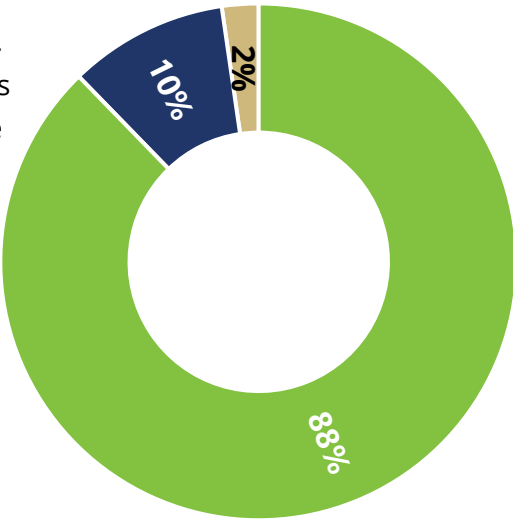
Exhibit 17. Likelihood to recommend the Backup Power Supply Program to others (n=711)

Detractors

respond with a score of 0 to 6. These are unhappy consumers who are unlikely to participate in the future.

Passives

respond with a score of 7 or 8. They are satisfied with the service but not happy enough to be considered promoters.



Promoters

respond with a score of 9 or 10 and are typically loyal and enthusiastic consumers.

Respondents offered feedback regarding their general experience with the program. Most of the comments included expressions of gratitude, comments concerning how easy the application was to complete, and reports that the equipment was of high quality.

Exhibit 18. Positive feedback about the Battery Backup Supply Program

Theme	Selected Responses
Expressions of gratitude	• We are very thankful for this program. As parents of a child dependent on equipment to sustain life, losing power has always been a concern. • Thank you to all the staff for their help and to the university for having the program for people in need. • This is a wonderful program for people who are reliant on power to live comfortably at home during power grid issues. We are very grateful for this program! • Thank you! That was huge during our latest windstorm and three-day power outage! Can't thank you enough!!!! • We could not afford one without your help. Thank you so much!
Easy application process	• Our family really appreciates your assistance with the application process. We had left the application incomplete, and someone reached out to encourage us to complete it in a timely manner. The delivery process was also seamless. • Everyone was super helpful in answering questions, and the application itself was very straightforward. I truly appreciate you all! • The emergency preparedness coordinator was very responsive to all of my questions and made the process a lot easier.
Quality equipment	• I was thoroughly and positively impressed by the quality of the generator. My late husband was an electrician, and I kind of know my way around electricity. • I am so very grateful for this program and especially for the backup power system!!! I was also surprised by the quality of the device. From what I gathered while doing research online to learn more about the power backup system, this is a top of the line device as well as being very well made. THANK YOU SO MUCH FOR BLESSING ME WITH THIS WONDERFUL DEVICE!!! • We recently had a power outage, and hooking up CPAP and an infinity feeding pump was super easy. I loved how I could see how much battery was remaining with the phone app. I also love the different charging options to recharge the battery for instance, the car adapter if we did run out of battery before the power was back on, we could have easily charged it in our vehicle.

SUGGESTIONS FOR IMPROVEMENT

Program participants provided three areas for program improvement. The suggestions included needing further assistance with equipment set up and operation. Participants also indicated a desire for solar panels to charge the battery in the event of a power outage. Finally, participants wanted more communication regarding equipment delivery, mainly due to the battery's weight.

Exhibit 19. Suggestions to improve the Battery Backup Supply Program

Theme	Selected Responses
Needed further assistance	• It would be beneficial to ask others if they need assistance to create a plan or use the device in the event they do not know what they are doing. It can be overwhelming when you have not used this before. • I have a couple of questions about this device and tried to call someone but I still haven't heard back from anyone. It would be nice if someone would call me back! • This system has many wonderful features that make it somewhat complicated to use. Although we were able to figure it out with a little research, I would hope that some recipients aren't discouraged by this and do not set up the equipment properly (or not at all). • I need help setting it up. It's too heavy for me.
Solar panels are needed	• Thank you so much for approving my request; this has been a life changer for me. I just need to get solar panels, and they are quite expensive. • Really needed the solar panels that aid with charging. Electricity is not always available to recharge the battery pack. • It would be a lot better for me if I could get solar panels for it. • It is nice, but I need another one or the extra batteries and generator available from EcoFlow to make it a complete system. It did not come with the D.C. charging cable or solar panels necessary to recharge the unit. So, currently, I am recharging by plugging into the house power, which defeats the entire purpose of surviving in place independent of the local power grid being down. Would it be possible to get the additional accessories, cables, solar panels, and units to make it a complete system?
More communication about delivery	• My only complaint is that after the email saying we were approved, there was no further correspondence in any way until the phone call, which said the delivery was 10 minutes away. I was two hours away at an appt. & thankfully, the private duty nurse was there to receive the delivery, or I couldn't have made it home. There was no prior notice of delivery outside of a ten-minute window. • We filled out the application and didn't hear anything, but then someone showed up to deliver it, and we were out of town. It would be nice to know we had been approved and an approximate delivery date so we could have helped get it up our crazy driveway in our car so the poor delivery guy didn't have to wheel it up on a dolly. • I didn't receive any notification about the delivery of the batteries. This would have been helpful to make sure that I was home to receive them. Other than that, I am very grateful to have them. Thank you.

RECOMMENDATIONS



Enhanced Training Materials: To address feedback from participants who found the equipment difficult to set up, the project team should consider providing additional training resources. These could include more detailed instructional guides, video tutorials, and one-on-one support for participants who require assistance with setting up and maintaining their backup battery systems.



Provision of Accessories: Some participants reported needing additional equipment, such as solar panels or DC charging cables, to fully utilize their backup systems during prolonged power outages. Program administrators may consider offering these accessories to participants or providing clearer information on how they can acquire them.



Improved Communication on Deliveries: Several respondents expressed concerns about the lack of communication regarding delivery timelines. The project team should improve communication with participants by providing clearer delivery notices, allowing recipients more time to prepare for the arrival of their backup battery.



MISSION

We strive to make evaluation a valued and widely accepted practice by increasing the use and understanding of evaluation. We collaborate with our clients to support evidence-informed programs, practices, and policies in schools, institutions of higher education, governmental agencies, and nonprofit organizations.



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