

## **Promoting Digital Equity by Automating Enrollment in Consumer Support Programs**

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### **Introduction**

Lifeline and the now defunct ACP (Affordable Connectivity Program) are part of the social safety net for low-income families. These programs have helped millions of families afford Internet services that support online learning, remote work, and access to telehealth, among many other uses linked to social and economic wellbeing. However, individuals and families entitled to receive these benefits often have to navigate a complex web of procedures to demonstrate eligibility, enroll in the program and receive services from private telecommunications service providers. These obstacles are collectively referred to as administrative burdens and impose a variety of costs that ultimately deter eligible individuals and families from applying in the first place or prevent them from receiving benefits in a timely and uninterrupted manner.

There is a vast literature on the costs and implications of administrative burdens, and these studies propose multiple ways to reduce them in order to maximize the impact of welfare programs.<sup>1</sup> Among the most promising strategies discussed in recent studies is the automation of procedures to verify eligibility for program enrollment and recertification. Automation builds on the increased digitization of citizen-state interactions and leverages the vast amounts of data that the government has on individuals and families. At the core of automation initiatives is the assumption that the burden of proof must shift from the beneficiary to the state, supported by data sharing agreements between government agencies (at both federal and state levels) that minimize the steps that eligible individuals and families must take to receive benefits.

In this study, we examine two initiatives to automate eligibility certification for programs that offer support for telephony and Internet services for low-income families. The first is the National Verifier (NV), a system developed by the Universal Service Administrative Company (USAC) on behalf of the Federal Communication Commission (FCC). Originally developed to support

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<sup>1</sup> See Pamela Herd, Hilary Hoynes, Jamila Michener, Donald Moynihan (2023), “Introduction: Administrative Burden as a Mechanism of Inequality in Policy Implementation.” *RSF: The Russell Sage Foundation Journal of the Social Sciences* 9 (5): 1-30; DOI: 10.7758/RSF.2023.9.5.01.

eligibility verification for the federal Lifeline program, the NV was also central to the implementation of ACP, with over 13.5M ACP recipients (out of a total of about 23M) verifying eligibility through the NV.<sup>2</sup>The second initiative is the “CalFresh Confirm” system that the California Public Utilities Commission (CPUC) put into place to automate eligibility verification for applicants to the California Lifeline program. Started at the end of 2021, the system checks for active Supplemental Nutrition Assistance Program (SNAP) participation to automatically determine eligibility for California Lifeline renewals and new enrollments, thus reducing paperwork and procedural steps for both existing and new beneficiaries.

Based on these case studies, this study probes for evidence that automation has reduced administrative burdens and facilitated program enrollment. In addition, it examines how the impact of automation is distributed across the eligible population – in other words, whether automation reduces administrative burdens for some groups more than for others. Finally, the study explores how automation initiatives affect other barriers for program enrollment such as awareness and psychological costs. The conclusion puts forth policy recommendations that offer guidance about automation initiatives as a tool to increase participation and improve the delivery of connectivity-support programs.

## **How Automation can Reduce Administrative Burdens**

Administrative burdens are the costs that individuals experience in their interactions with the state, which among others include the costs associated with applying, certifying eligibility, and receiving welfare benefits. Overcoming administrative burdens requires multiple resources, including literacy, time, support networks and cognitive resources, which is why these burdens are often disproportionately experienced by individuals who need benefits the most. As Herd et al. (2023) argue, because those with fewer resources are often disproportionately impacted by onerous procedures for verification and benefit delivery, administrative burdens tend to reinforce existing patterns of social inequality.<sup>3</sup> Research shows that even small hassles in welfare enrollment can have a large effect on program participation.<sup>4</sup>

Scholars have identified three main types of administrative burdens: 1) learning costs, which are the costs associated with information search and evaluation; 2) psychological costs, which are the costs associated with stigmatization as a welfare recipient, the perceived lack of agency in citizen-state interactions, and the stress that emanates from such interactions; and 3) and compliance costs, which are the costs associated with completing paperwork as well as the financial expenses that applicants incur throughout the process (e.g., driving to a welfare office, mailing a required form, etc.).<sup>5</sup>

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<sup>2</sup> <https://www.usac.org/about/affordable-connectivity-program/acp-enrollment-and-claims-tracker/additional-acp-data/>

<sup>3</sup> Herd et al., 2023.

<sup>4</sup> Shepard, M., & Wagner, M. (2023). Reducing Ordeals through Automatic Enrollment: Evidence from a Health Insurance Exchange. Available at <https://research.hks.harvard.edu/publications/getFile.aspx?Id=5190>.

<sup>5</sup> Schweitzer, J. (2022). How To Address the Administrative Burdens of Accessing the Safety Net. Available at <https://www.americanprogress.org/article/how-to-address-the-administrative-burdens-of-accessing-the-safety-net>.

Conversely, previous research has demonstrated that administrative easing in the form of real-time eligibility decisions and presumptive eligibility (“eligible until proven otherwise”) increases access to safety net programs.<sup>6</sup> Starting in the mid-1990s, a series of legislative changes at the federal and state level enabled automation in welfare eligibility determinations by promoting data interoperability and exchange among government agencies.<sup>7</sup> Evidence from studies of Medicaid and other programs strongly suggests that automating eligibility determination promotes the uptake of welfare benefits.<sup>8</sup>

At the same time, previous studies also warn about the potential risks of automation. These risks span across data quality problems, biases in algorithm-based systems, and limitations in opportunities for applicants to contest automated determinations.<sup>9</sup> For example, the automation of enrollment assistance in Indiana in 2007 resulted in steep drops in SNAP, TANF, and Medicaid enrollments, partly because it reduced applicants’ opportunities to contest eligibility determinations with caseworkers.<sup>10</sup> Reducing administrative burdens through automation must always consider the risk of excluding the most vulnerable, who are more likely to be disconnected from the welfare system in the first place and have fewer resources (time, money, Internet access, and so forth) to overcome procedural hassles.

### **Case study #1: National Verifier**

In March 2016, the Federal Communications Commission (FCC) adopted the Lifeline and Link Up Reform and Modernization order, which mandated changes to existing mechanisms for eligibility verification, enrollment, and (re)certification in the Lifeline program.<sup>11</sup> The order was a response to concerns about increasing program costs as well as fraud and abuse by Lifeline service providers, who until then were responsible for verifying the eligibility of applicants.<sup>12</sup> Following the 2016 order, the FCC authorized USAC to develop a system to independently conduct and determine eligibility. The result was the National Lifeline Eligibility Verifier (or National Verifier, henceforth NV), an interface tool between Lifeline service providers and state/federal databases

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<sup>6</sup> Fox et al., (2021). The effect of administrative burden on state safety-net participation: Evidence from food assistance, cash assistance, and Medicaid. *Public Administration Review* 83(2).

<sup>7</sup> Wilson, S. (2014). E-government legislation: Implementation issues for programs for low-income people. *Government Information Quarterly* 31.

<sup>8</sup> Wishner, J., Hill, I., Marks, J., & Thornburgh, S. (2018). Medicaid Real-Time Eligibility Determinations and Automated Renewals. The Urban Institute.

<sup>9</sup> Jørgensen, R. F. (2023). Data and rights in the digital welfare state: The case of Denmark. *Information, Communication & Society*, 26(1), 123–138. <https://doi.org/10.1080/1369118X.2021.1934069>. See also Dencik, L.,

& Kaun, A. (2020). Datafication and the Welfare State. *Global Perspectives*, 1(1). <https://doi.org/10.1525/gp.2020.12912>

<sup>10</sup> Wu, D., & Meyer, B. D. (2023). Certification and Recertification in Welfare Programs: What Happens When Automation Goes Wrong? (Working Paper 31437). National Bureau of Economic Research.

<https://doi.org/10.3386/w31437>

<sup>11</sup> <https://docs.fcc.gov/public/attachments/FCC-16-38A1.pdf>

<sup>12</sup> See Horrigan, J. Reimagining Lifeline: Universal service, affordability and connectivity. Available at <https://www.benton.org/publications/reimagining-lifeline>. See also GAO, Telecommunications: Improved Management Can Enhance FCC Decision Making for the Universal Service Fund Low-Income Program, GAO-11-11 (Washington, D.C.: Oct. 28, 2010).

that automates eligibility determinations based on applicants’ participation in qualifying programs.

First launched in 2018, the NV performs automated checks for participation in welfare programs by cross-referencing state and federal databases to assess whether applicants are eligible for Lifeline benefits. USAC progressively established data sharing agreements with multiple state and federal agencies, including the Federal Public Housing Assistance Program (FPHA), the Centers for Medicare and Medicaid Services (CMS), and the U.S. Department of Veterans Affairs (VA). At the state level, database connections have been established to determine participation in the Supplemental Nutrition Assistance Program (SNAP), the Social Security Income program (SSI), the Temporary Assistance for Needy Families (TANF), and Medicaid. As of December 2023, the NV had established data-sharing agreements with 24 state agencies and 3 federal agencies.<sup>13</sup>

The deployment of the National Verifier across the United States began in mid-2018 and ended in 2020. Figure 1 shows when the rollout of the NV was completed in each state or territory. Further, this [dashboard](#) contains detailed information about which database (Medicaid, SNAP, CMS, FPHA, SSI, VA) was connected in which state during the NV launch period. It should be noted that California, Oregon, and Texas remain outside the NV – they are so-called “opt-out” states that rely on third parties contracted by each state’s public utility commission (under USAC supervision) to determine Lifeline eligibility.<sup>14</sup>

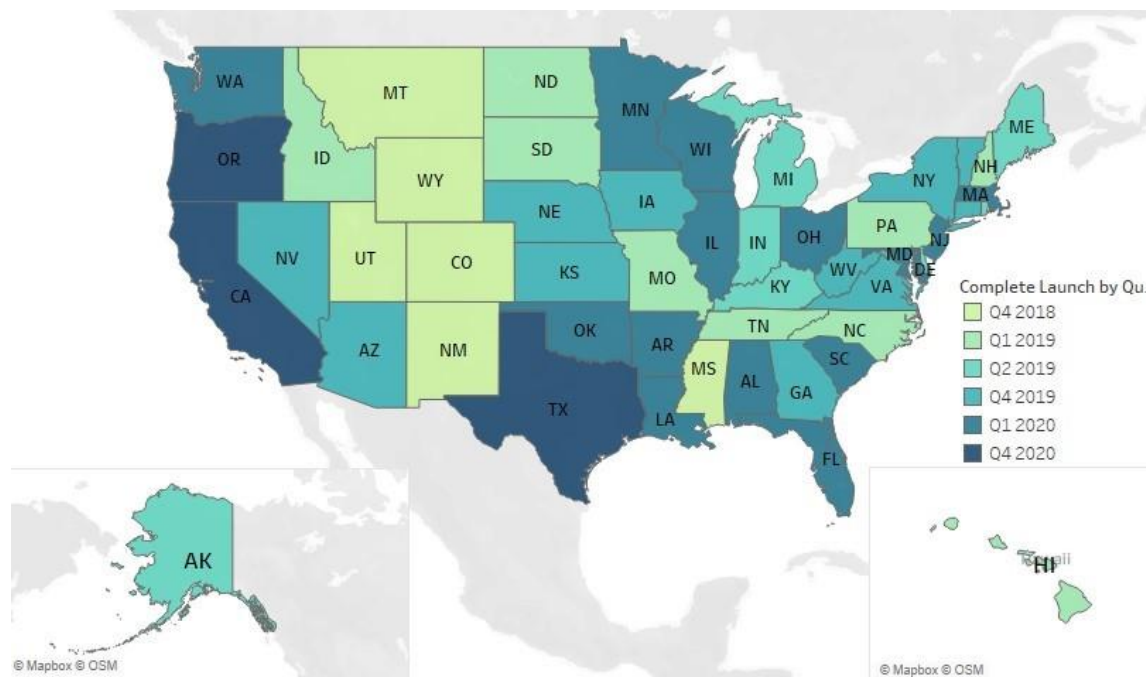


Figure 1: Date of National Verifier (NV) rollout by state (source: USAC).

<sup>13</sup> <https://www.usac.org/wp-content/uploads/lifeline/documents/nv/reports/National-Verifier-Annual-Report-January-2023.pdf>

<sup>14</sup> For details see <https://www.usac.org/lifeline/national-verifier/how-to-use-nv/launches/national-verifier-opt-out-launch>

The National Verifier system comprises three interrelated processes: determining eligibility for new applicants, recertification on an annual basis, and reverification.<sup>15</sup> In addition, the NV is also used to verify an applicant's identity and determine whether it matches an existing recipient (Lifeline is limited to one benefit per household). If eligibility or identity (including duplicate checking) cannot be verified automatically, applicants are required to submit additional documentation (online or by mail).

In the most recent quarter for which data is available (Q4 2023), the NV processed about 4M Lifeline applications.<sup>16</sup> Of these, about two-thirds (63%) were qualified automatically, while the remaining third were notified that additional documentation was required (documentation must be submitted within 45 days). Interestingly, however, only about a third of those not qualified automatically followed up by submitting documents for manual review. In addition, an earlier audit study by the Government Accountability Office (GAO) found that manual review requests were more likely in states without a dataset connection to NV.<sup>17</sup> Taken together, while this evidence suggests that automated eligibility determinations can reduce administrative burdens, there remain significant frictions in the Lifeline enrollment process when applicants cannot be automatically verified.

As shown in Figure 2, enrollment in the federal Lifeline program has been on a steady decline since peaking in the early 2010s. This trend is associated with a series of changes in program rules aimed at controlling program costs and strengthening oversight over eligibility determinations and support claims. The 2012 Reform and Modernization Order contained key program reforms, such as codifying the one-per-household rule, unifying eligibility criteria across states and de-enrolling subscribers for non-usage after 60 days.<sup>18</sup>

A second set of reforms came with the 2016 Reform and Modernization Order, which as discussed led to the creation of the NV. At first sight, Figure 2 seems to indicate that the launch of the NV accelerated the decline in Lifeline participation. However, it is important to recall that a) the NV was part of a larger package of program reforms included in the 2016 Order, and b) the NV was first launched (in a limited number of states) in June 2018, over two years after the release of the 2016 Order. It is in this broader context of program reforms and weakening enrollment that the rollout of the NV must be evaluated.<sup>19</sup>

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<sup>15</sup> Reverification refers to a one-time validation procedure that accompanied the rollout of the NV and that required existing subscribers (who were previously verified by service providers in each state) to revalidate eligibility through the NV.

<sup>16</sup> See <https://www.usac.org/wp-content/uploads/lifeline/documents/Data/2023-Q4-National-Verifier-Quarterly-Eligibility-Data.pdf>

<sup>17</sup> GAO (2021). FCC Has Implemented the Lifeline National Verifier but Should Improve Consumer Awareness and Experience. Available at <https://www.gao.gov/assets/gao-21-235.pdf>.

<sup>18</sup> See GAO (2015). FCC Should Evaluate the Efficiency and Effectiveness of the Lifeline Program. Available at <https://www.gao.gov/assets/gao-15-335.pdf>

<sup>19</sup> The small increase in enrollment between 2022 and 2023 suggests that the trend may be reversing, and deserves monitoring in future studies when more recent data becomes available.

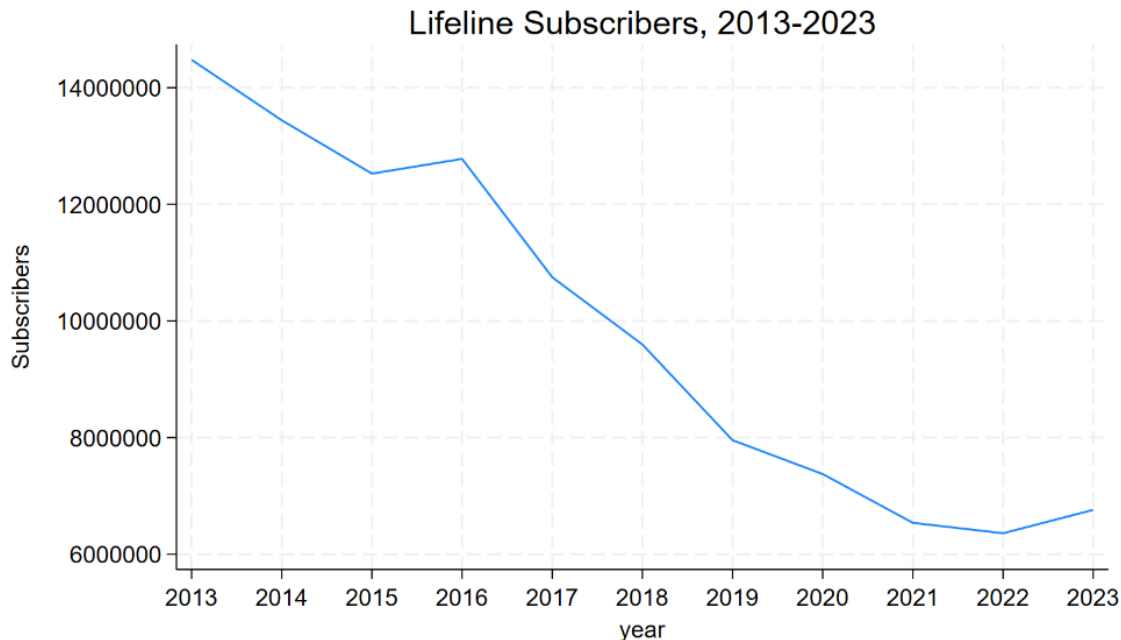


Figure 2: Lifeline subscribers 2013-23 (source: FCC).

To assess the impact of automated eligibility determinations on Lifeline enrollment, and to separate its impact from other reforms in the 2016 Order, this study takes advantage of the staggered rollout of the NV across states. As shown in Figure 1, the rollout took place over a period of about 18 months (between mid-2018 and the end of 2020). Conceptually, one can think of states as belonging to different rollout cohorts: a cohort of early adopters in 2018 (which included just six states), the 2019 cohort (28 states) and the late-adopter cohort of 2020 (18 states).

The panel data analysis exploits the staggered rollout of the NV by comparing Lifeline enrollment in states where the NV has already been launched (the “treated” units in an experimental research framework) to states where the NV is yet to be launched (the “control” units). This is an example of difference-in-difference analysis with staggered treatment but without a never-treated control group.<sup>20</sup> Note that because the NV had been launched in all states by the end of 2020, the impact on the last cohort (year 2020, 18 states) cannot be evaluated since there are no yet-to-be-treated states left to use as control units. The dataset includes information for the 50 states plus the District of Columbia and Puerto Rico, for a total of 52 units of observation over a 10-year period (2013-2023).<sup>21</sup> However, the three opt-out states (California, Oregon, and Texas) are excluded from the analysis.

The regression model results indicate that the rollout of the NV is associated with an increase in the number of Lifeline subscribers. On average, NV rollout in a state is associated with an increase

<sup>20</sup> For a technical discussion, see Callaway, B., & Sant’Anna, P. (2021). Difference-in-Differences with multiple time periods. *Journal of Econometrics* 225(2).

<sup>21</sup> All other U.S. territories are excluded.

of about 20,000 subscribers per year ( $p < 0.08$ ), above and beyond what one would expect relative to states where the NV was yet to be launched. This represents an increase of about 10% in the number of subscribers, relative to the average enrollment in 2017, the period immediately before the rollout of the NV in the first cohort of states.

The evidence also suggests that the positive impacts of automation increase over time. Figure 3 compares Lifeline enrollment between treated and yet-to-be-treated states for each period before and after treatment. The baseline period for comparison is -1, the year immediately before treatment for each cohort (which is why no estimates exist for period -1). As shown, there are no statistically significant differences in pre-treatment periods (at  $p < 0.05$ ). Interestingly, a significant increase in subscribers is observed only a year after the launch of the NV (in period +1, but not in period 0 which is the treatment year for each cohort). This may be partly explained by the fact that in some states the NV launched late in the year, and therefore the impact is not observed in the same period. Yet this finding also suggests that the benefits of automation accumulate over time, as service providers adapt processes and investments to the new system and consumers learn about the potential benefits of real-time eligibility determinations.

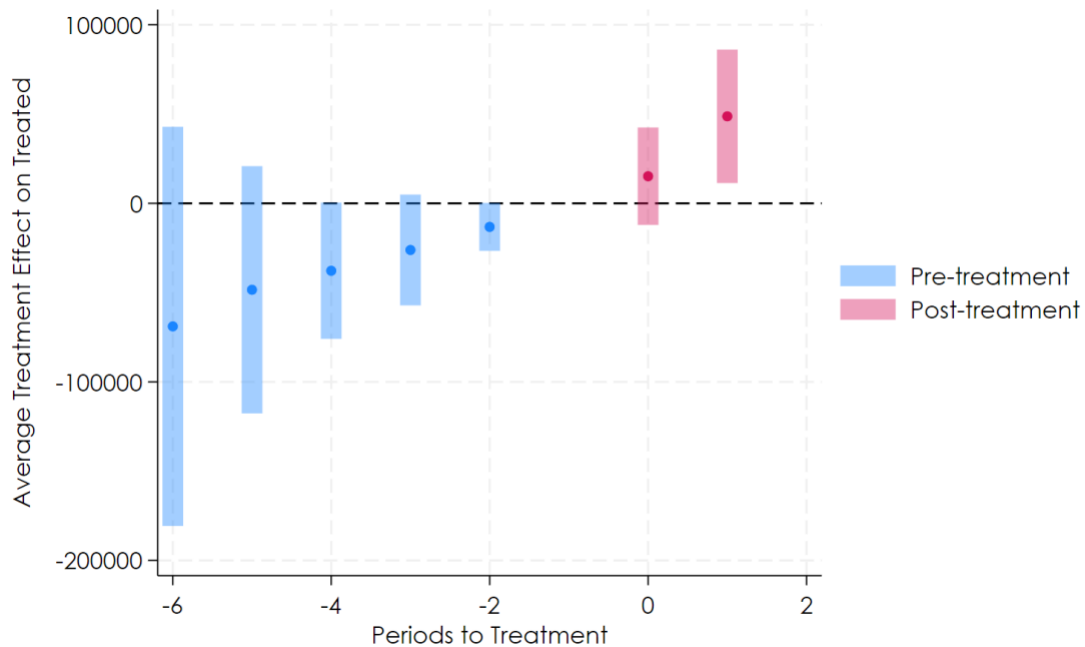


Figure 3: Estimated Effect (ATT) of NV on Lifeline subscription

### Case Study #2: California Lifeline CalFresh Confirm

California Lifeline is a state subsidy program administered by the California Public Utilities Commission (CPUC) that provides discounts for voice and data services to qualifying

households. It is independent from the federal Lifeline program, and program eligibility rules are somewhat broader for CA Lifeline than for the federal program.<sup>22</sup> Currently, CA Lifeline provides a maximum service discount of up to \$19/month, a benefit significantly higher than the Federal Lifeline benefit of up to \$9.25/month (recipients may participate in either or both programs). The combination of higher benefits and broader eligibility explains why California is among the states with the highest rates of Lifeline program uptake.<sup>23</sup>

Nonetheless, the program has followed a similar pattern of decreasing enrollment as the federal Lifeline program (Figure 4). As of December 2023, about 1.2M recipients were enrolled in CA Lifeline. Similar to the federal Lifeline program, CA Lifeline overwhelmingly supports wireless services, although the share of wireline services (about 13%) is higher than in the case of the federal Lifeline, which is likely associated with the higher benefit amount provided.<sup>24</sup>

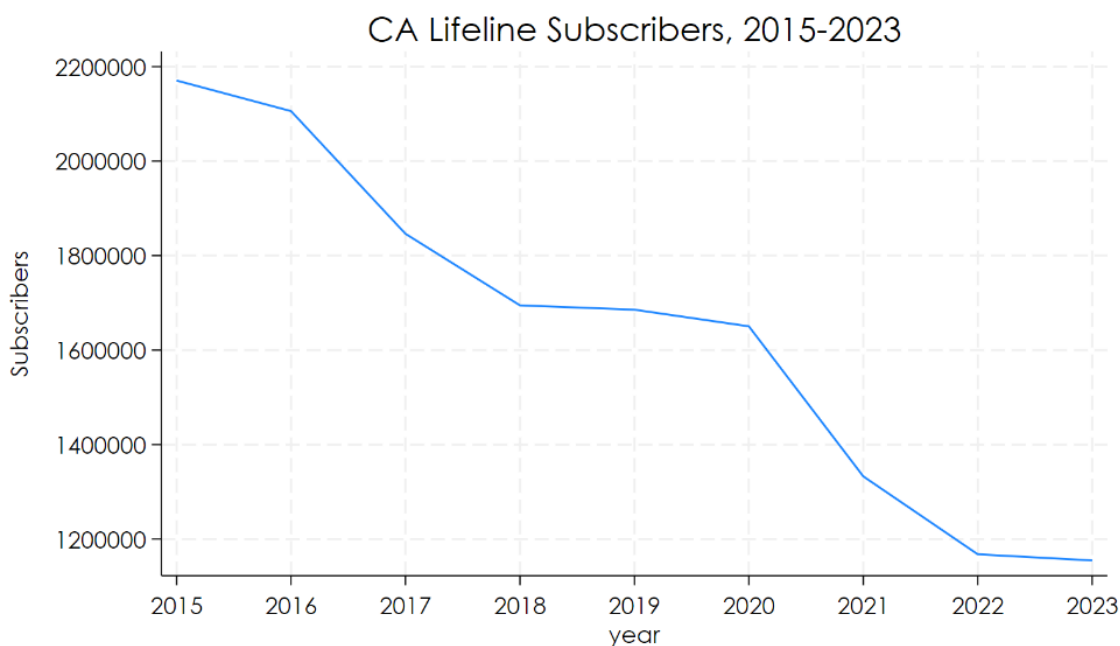


Figure 4: CA Lifeline subscribers 2015-23 (source: CPUC)

As noted, California is an NV “opt-out” state, and therefore eligibility determination are made by a Third Party Administrator (TPA) contracted by the CPUC.<sup>25</sup> In December 2021, the TPA began implementing a new system for automating program renewals and new enrollments by checking

<sup>22</sup> Notably, the income threshold for CA Lifeline eligibility is 150% of the federal poverty line (FPL), compared to 135% for federal Lifeline program.

<sup>23</sup> See Bar et al., (2023). The California Lifeline Program. MEDIA Project Case Study #3. Available at <https://arnicusc.org/wp-content/uploads/2024/01/MEDIA-Case-Study-3-CA-LifeLine-Addendum-Oct-2023.pdf>

<sup>24</sup> See [https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/communications-division/documents/lifeline/customer-count/2023\\_maximussubscribercountsasof\\_01122024.xls](https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/communications-division/documents/lifeline/customer-count/2023_maximussubscribercountsasof_01122024.xls)

<sup>25</sup> The only exception are broadband-only CA Lifeline subscribers, who are verified through the NV (see GAO, 2021).



eligibility based on active CalFresh (SNAP) participation.<sup>26</sup> The system took advantage of CalFresh Confirm, an API solution developed by the California Department of Social Services (CDSS) to verify SNAP participation in real time.<sup>27</sup> Notably, the system preemptively recertified existing subscribers by checking against active CalFresh participation. At the time of implementation (end of 2021), about a third of CA Lifeline recipients (32.1%) were qualified through CalFresh.<sup>28</sup> By December 2023, the share of recipients qualifying through CalFresh had almost doubled to 61%.

To evaluate the impact of the CalFresh automated verification system, this study uses a unique dataset that disaggregates CA Lifeline recipients by qualification method at the zipcode level.<sup>29</sup> Combining this data with demographic information from the ACS survey (ACS 2022 5-year data) at the zipcode level allows for examining how the benefits of automation are distributed across populations. In other words, the question is whether the benefits of automation favor certain groups more than others, and whether complementary initiatives are needed to mitigate the risk of reducing access to benefits among disadvantaged groups. The dataset combines information from CPUC and the ACS for 1,704 CA zipcodes, and the period of analysis extends between 2021 (immediately before the launch of CalFresh Confirm) and 2023 (the most recent data available).<sup>30</sup>

As a first approximation, Figure 5 suggests that a positive association exists between the change over time in the share of recipients qualifying through SNAP and the change in CA Lifeline subscriptions. In other words, despite the overall drop in program participants during the evaluation period, in zipcodes where more recipients embraced the CalFresh Confirm system we also observe a larger relative change (or a smaller relative drop) in program enrollment. This [dashboard](#) allows for exploring the bivariate relation between changes in enrollment and demographic variables in more detail.

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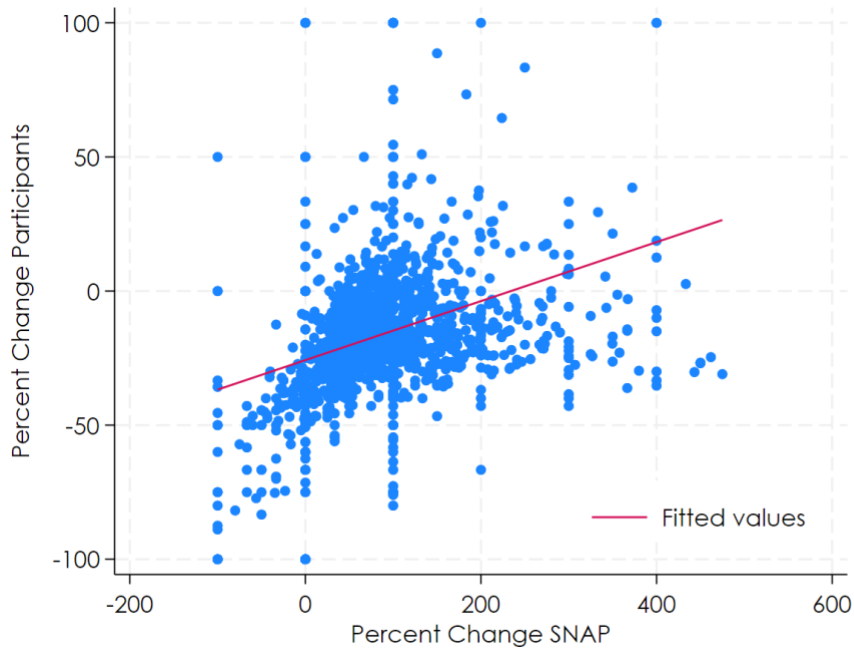
<sup>26</sup> CPUC, California Lifeline – New Enrollment Application Timeline, available at <https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/communications-division/documents/lifeline/california-lifeline-administrator/california-lifeline-application-process-timeline121621.pdf>

<sup>27</sup> CPUC (2022). California Lifeline Program Assessment and Evaluation. Available at <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M478/K367/478367564.PDF>

<sup>28</sup> This compares to 51.6% that qualified through MediCal (Medicaid) program participation. However, privacy rules related to medical data (e.g., HIPAA) present challenges to data connections with MediCal (see Bar et al., 2023. The California Lifeline Program. MEDIA Project Case Study #3).

<sup>29</sup> The data was provided by CPUC under a research agreement with the authors.

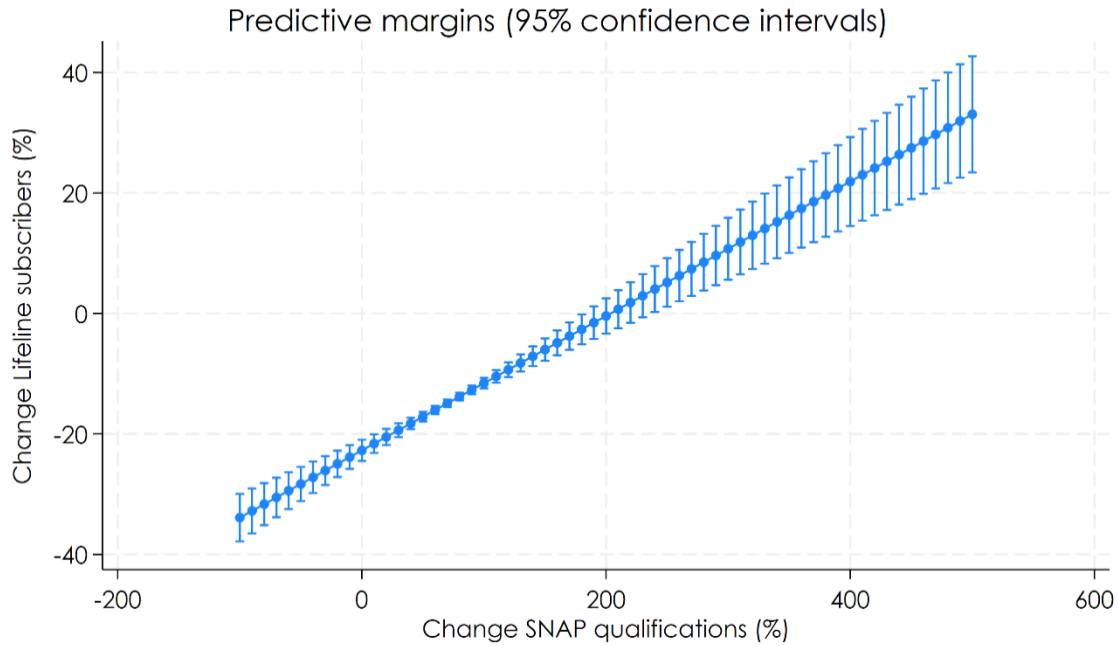
<sup>30</sup> Naturally, zipcodes lacking geographical boundaries (e.g., P.O. box zipcodes) are excluded.



*Figure 5: Change in SNAP qualifications and change in CA Lifeline subscribers (%)*

To corroborate this finding, we estimate a regression model that predicts change in total CA Lifeline subscribers between December 2021 and December 2023 at the zipcode level. The key predictor is the change in the share of recipients certified through CalFresh, and controls include poverty, median age, race/ethnicity (Hispanic), education, housing tenure (owner/renter), presence of children, English-language ability and citizenship status.

The results confirm that automated certification through Calfresh Confirm is associated with increased program participation (see Table A1 in Appendix). To illustrate this result, Figure 6 plots model predictions for change in program enrollment (Y axis) over the observed values of change in CalFresh qualifications (X axis). As shown, as CalFresh verification grows so does the predicted change in program enrollment during the study period.

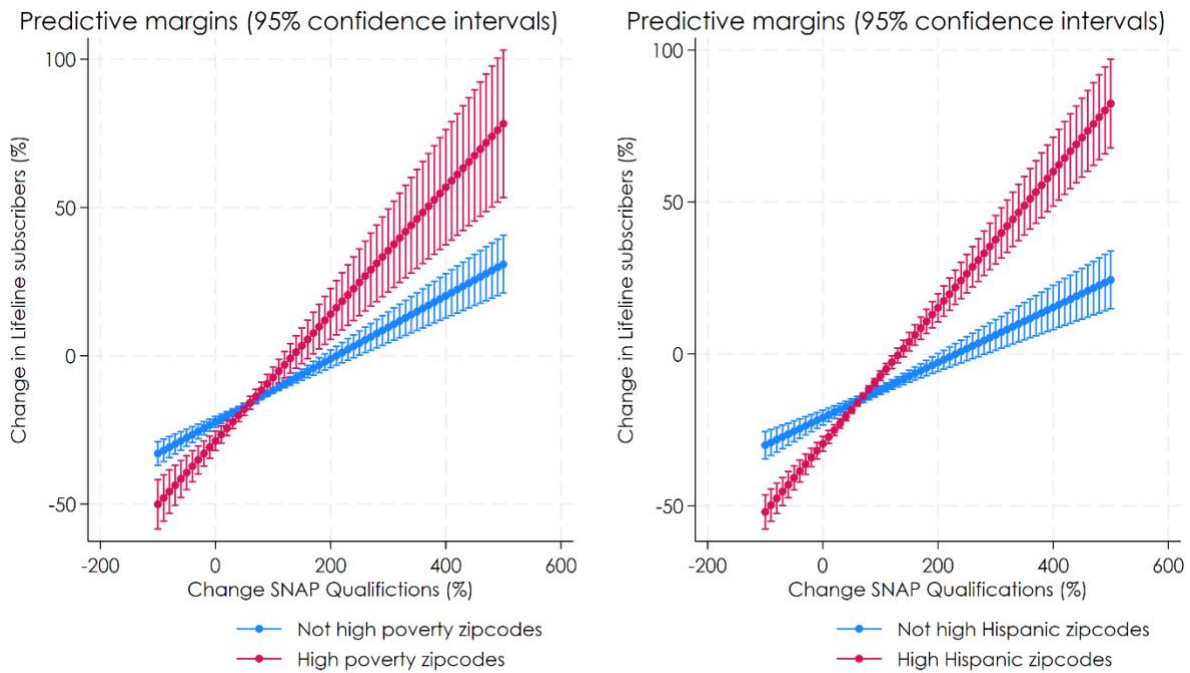


*Figure 6: Predicted change in CA Lifeline uptake over change in CalFresh qualification (%)*

Further, the availability of disaggregated data at the zipcode level allows for probing for different impacts across populations of interest. For example, the association between CalFresh qualifications and change in enrollment appears to be stronger in high-poverty areas (Figure 7), suggesting that poor recipients have benefitted more from automated certification.<sup>31</sup> Unsurprisingly, a similar pattern is found for areas with higher than average Hispanic residents.

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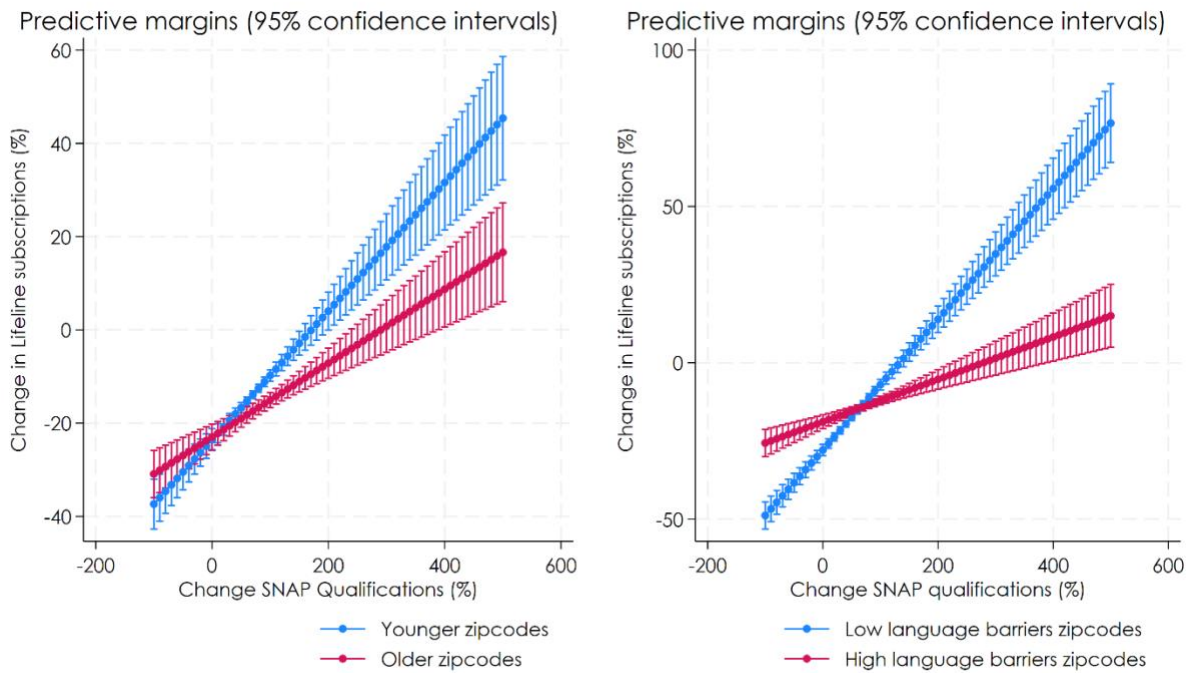
<sup>31</sup> Following the Census Bureau definition, high-poverty areas are zipcodes with poverty rates of 20% more.



*Figure 7: Predicted change in CA Lifeline uptake over change in CalFresh qualification (%). Note: High-Hispanic areas are zipcodes with higher than average share of Hispanic residents.*

On the other hand, Figure 8 suggests that automated certification has benefitted younger recipients more than older recipients. This is consistent with research that underscores the critical need for personalized, on-the-ground assistance to support welfare program participation among older adults. In addition, because less than 40% of eligible older adults participate in SNAP (compared to 90% or more for younger age groups), this reveals how automation can exacerbate inequality by amplifying differences in uptake of qualifying programs.<sup>32</sup> Similarly, the impact of automation appears smaller in areas with higher shares of residents with English-language barriers. Whether this reflects different levels of SNAP participation, low awareness about the new system, or differences in service provider outreach strategies deserves further research. Regardless, it is yet another example of how the benefits associated with automated certifications and reduce administrative burdens are unequally appropriated across disadvantaged populations.

<sup>32</sup> Herd, P. (2015). How Administrative Burdens Are Preventing Access to Critical Income Supports for Older Adults: The Case of the Supplemental Nutrition Assistance Program. *Public Policy & Aging Report*, 25(2).



*Figure 8: Predicted change in CA Lifeline uptake over change in CalFresh qualification (%). Note: Older areas are those with higher than average median age, while high language-barrier are zipcodes with higher than average share of residents who speak English “less than well”*

## Conclusion

Digital equity programs that provide direct support to households have gained increased attention since the COVID-19 pandemic. By the time of the enrollment freeze in February 2024, over 23M households had enrolled in ACP, and yet this represents only about half of all eligible households.<sup>33</sup> As shown, participation in the Lifeline program has been trending downward since peaking in the early 2010s, despite the increased need for robust connectivity for work, education, information-seeking and other essential activities.

There is overwhelming evidence that reducing administrative burdens by automating certification and offering real-time eligibility determinations can boost participation in social programs. In this study, we explore two such initiatives in digital equity programs: the NV, which automated eligibility determinations in programs administered by USAC (Lifeline and ACP), and CalFresh Confirm, which automated annual recertifications for the CA Lifeline program. By matching program data with demographic information, the study sheds light on the benefits and risks associated with these initiatives.

<sup>33</sup> For a discussion of how the number of eligible households is estimated see Galperin (2002). Estimating participation in the Affordable Connectivity Program (ACP). MEDIA Project Policy Brief #2. Available at <https://arnicusc.org/wp-content/uploads/2022/10/Policy-Brief-2-ACP-eligibility-final-1.pdf>

Overall, the results suggest that automation has the potential to reduce administrative burdens by leveraging existing information about participation in qualifying programs. Amidst the overall drop in federal Lifeline enrollment, the findings show that states that launched the NV earlier fared better (that is, experienced smaller drop in enrollment) relative to those that launched later. Further, they indicate that the benefits are realized over time as both recipients and service providers adjust to the new system.

At the same time, the findings also underscore the risks that automation presents. The implementation of CalFresh Confirms greatly simplifies recertifications for CA Lifeline recipients, however the benefits are contingent on participation in SNAP. The results show that, because older adults are less likely to receive SNAP benefits (regardless of eligibility), they are also less likely to benefit from automation through CalFresh Confirm. This risks amplifying pre-existing inequalities in welfare program participation, and underline the need for careful planning and evaluation of automation initiatives in digital equity support programs.

**Table A1 (Appendix)ca**

Dependent variable: Change in CA Lifeline uptake over 2021-23 period

VARIABLES	Marginal Effect
Change in SNAP qualifications (%)	0.112*** (0.0115)
Poverty rate (%)	-0.191** (0.0822)
Median age	-0.947*** (0.133)
White population (%)	0.0876 (0.0692)
Black population (%)	0.411*** (0.0944)
Asian population (%)	0.180** (0.0840)
Hispanic population (%)	0.0481 (0.0503)
Education (% bachelor or higher)	-0.152*** (0.0422)
Renter-occupied HHs (%)	-0.0684 (0.0442)
Presence of children in HH (%)	-0.0568 (0.0732)
Speak English less than well (%)	-0.577*** (0.127)
Not U.S. citizen (%)	-0.304*** (0.0919)
Constant	21.23** (10.13)
Observations	1,669
R-squared	0.292

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## About the project

This study is part of the Measuring the Effectiveness of Digital Inclusion Approaches (MEDIA) project, a research program that seeks to analyze broadband inclusion initiatives and provide evidence-based recommendations on how best to connect low-income households to broadband on a sustainable basis. The project is supported by The Pew Charitable Trusts and includes the California Emerging Technology Fund (CETF) as a key research partner. The views expressed herein are those of the author(s) and do not necessarily reflect the views of The Pew Charitable Trusts or the California Emerging Technology Fund.

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