NITC
NATIONAL INSTITUTE for TRANSPORTATION and COMMUNITIES

Final Report 1435
October 2022

Accessing Opportunities for Household Provisioning Post-COVID-19

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NITC-RR-1435

by

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October 2022

Technical Report Documentation Page

1. Report No. NITC-RR-1435	2. Government Accession No	3. Recipient's Catalog No.
4. Title and Subtitle Accessing Opportunities for Household Provisioning Post-COVID-19		5. Report Date October 2022
		6. Performing Organization Code
7. Author(s) Kelly Clifton: 0000-0002-7669-4833 Amanda Howell: 0000-0002-9252-0796 Kristina Currans: 0000-0001-6522-0758 Gabriella Abou-Zeid: 0000-0002-1583-4898 Max Nonnamaker: 0000-0003-3329-4458 Paula Carder: 0000-0002-8584-5226		8. Performing Organization Report No.
9. Performing Organization Name and Address Portland State University University of Oregon University of Arizona		10. Work Unit No. (TRAIS)
		11. Contract or Grant No. 69A3551747112
12. Sponsoring Agency Name and Address U.S. Department of Transportation Office of the Assistant Secretary for Research and Technology 1200 New Jersey Avenue, SE, Washington, DC 20590		13. Type of Report and Period Covered
		14. Sponsoring Agency Code
15. Supplementary Notes		

16. Abstract

In this project, we used a mixed-methods study to collect critical information to evaluate the extent to which people modified their shopping behavior, either by choice or necessity, to meet their provisioning needs during the COVID-19 crisis and the following recovery. First, four waves of a cross-sectional survey were administered online to a representative sample of households in Arizona, Florida, Michigan, Oregon, and Washington. This longitudinal, comparative study responded directly to a critical research gap and advanced behavioral science by providing a rich survey dataset to support and test theories of behavioral change and technology adoption. Second, focus groups were conducted with older adults in Oregon to discuss their arc of technology adoption for grocery shopping. Focus groups were also conducted with two sets of mentors who provide assistance to family members and friends with online food purchases to understand what kinds of interventions might be necessary to broaden access to e-commerce and delivery platforms for vulnerable populations. This report presents high-level descriptive statistics from these surveys comparing results by wave and/or by state. The findings from the focus groups with older adults and mentors are also described. The findings of this research are critical for emergency planning but also for understanding the ever-changing mechanism used to access retail and service opportunities (whether in-person vs. online), and the opportunities for future interventions to remedy barriers to accessing food that are relevant after the pandemic recovery.

17. Key Words	18. Distribution Statement
COVID-19, grocery shopping, e-commerce, delivery, mode choice, food access	No restrictions. Copies available from NITC: www.nitc-utc.net

19. Security Classification (of this report)	20. Security Classification (of this page)	21. No. of Pages	22. Price
Unclassified	Unclassified	74	

ACKNOWLEDGEMENTS

This project was funded by the National Institute for Transportation and Communities (NITC; grant number NITC-RR-1435), a U.S. DOT University Transportation Center.

We are very grateful to Bandana Shrestha (AARP Oregon), Bea Yeh Ogden and Misha Belden (Asian Pacific American Network of Oregon), and Helen Buckingham and Rachael Duke (Community Partners for Affordable Housing) for their assistance with recruiting focus group participants. In addition, we appreciate the support of student groups at Portland State University and Portland Community College (including PCC International, PCC Cascade Native Nations, PCC Rock Creek German Club, PSU Queer Resource Center, PCC GIS Club, PCC Ageless Network Club, and PSU Public Health Student Organization) for sharing our focus group recruitment materials with their members. We also thank Blair Vallie and Georgia Pennington for their early research support on this project, as well as the 25 students enrolled in Dr. Paula Carder's Qualitative Research Methods (PHE 520) course at Portland State University during Fall 2021 for their review and analysis of our focus group transcripts.

Additional funding support for this work came from the National Science Foundation RAPID Program (Award #2030205, PI Clifton).

DISCLAIMER

RECOMMENDED CITATION

Clifton, Kelly, Amanda Howell, Kristina Currans, Gabriella Abou-Zeid, Max Nonnamaker, and Paula Carder. *Accessing Opportunities for Household Provisioning Post-COVID-19*. NITC-RR-1435. Portland, OR: Transportation Research and Education Center (TREC), 2022.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

The acquisition of food and household necessities was dramatically impacted by the COVID-19 pandemic as people were asked to minimize travel to avoid exposure, supply chains were disrupted, transit services were reduced, and stores and restaurants closed or modified operations. Aided by technology, online retailers and delivery services acted to fill some of the gaps left by the disruption. However, the ability to access goods and services varies substantially across different subgroups of the population. This project capitalized on this unique opportunity to understand activity and travel behavioral change during this dynamic period of crisis and recovery, to examine the ways new technologies may be used in household provisioning, and to identify the most common barriers faced by vulnerable subgroups, such as the elderly, low-income, or disabled populations. This study captured how households responded as local, state, and federal governments imposed and lifted restrictions, brick-and-mortar establishments closed and reopened, and e-commerce and delivery services adjusted.

The project employed a mixed-methods approach to collect critical information to evaluate the extent to which people modified their shopping behavior to meet their provisioning needs during the COVID-19 crisis and following recovery. Four waves of cross-sectional surveys were administered online to households in Arizona, Florida, Michigan, Oregon, and Washington from September 2020 through November 2021. These surveys were designed to understand: How have people accessed essential goods during the pandemic crisis and recovery periods? What barriers have certain subgroups faced in accessing essential goods? And to what extent do/can online platforms help meet demand? High-level findings of these surveys are provided in this report, comparing results by wave and/or by state. These data are also an important deliverable of this work and have been made publicly available for future use by researchers.

A qualitative component complemented these survey data to understand more about how a specific population segment —older adults—adjusted to the conditions of COVID-19 in their grocery shopping and their adoption of e-commerce and delivery technologies. In addition, adult mentors were interviewed with the intention of understanding barriers to technology adoption and use, and to identify the types of interventions that support and promote e-commerce as an option. The results of these qualitative focus groups and interviews are included in this report as well.

Over the course of the pandemic, the majority of shoppers continued to travel to grocery stores and supermarkets and shop in-store as their primary means of acquiring goods and other household items. Across the waves, there were modest shifts in in-store shopping frequency that correspond to key moments in the COVID-19 timeline, such as specific outbreaks and the availability of vaccines. The pandemic was the catalyst for many to try online grocery shopping and there were distinct differences in the proportions reporting having tried it by state. While the use and adoption rates were modest, it appears to have a largely complementary role to in-store shopping, rather than a substitution for this activity outright. Shoppers mainly drove to retailers to acquire

food, but there were changes in mode shares over the course of the pandemic. Walking, cycling, transit, and ridehailing all saw increases in usage over the four waves of the survey. In terms of food access, mobility barriers, such as vehicle ownership and mobility-limiting conditions, were cited more often than technological ones, such as access to smartphones, broadband, or credit cards. Looking a year into the future, about 60% of households projected that online shopping would play some role in their household provisioning. The biggest limitations to future growth of e-commerce in the food sector is the inability to inspect items for quality and delivery fees.

The focus groups with older adults who had done some online shopping previously provided more context about provisioning behavior and the use of online platforms for grocery shopping. Most respondents rated their digital acumen has high and they were mostly confident in their technology skills. As with the survey respondents, most preferred to shop in-store for groceries, although the pandemic was the impetus for trying online grocery shopping. Notable reasons for preferring in-store shopping include the desire for many to pick out their own perishable goods, viewing shopping as a social activity, and being able to read the food labels. Some expressed distrust of those shopping for e-commerce platforms, citing their inability to pick out the best produce, make appropriate substitutions, and profit motives in selecting sizes. On fixed incomes, their desire to minimize costs, utilize coupons, and shop sales also reinforced their preferences for in-store shopping.

These results have implications for planning for food access into the future, including widespread emergency planning for events such as the pandemic as well as episodic crises that individuals may experience. In-store food shopping is a mainstay for household provisioning and will likely remain so into the future. However, online shopping did fill important gaps for people who were immunocompromised or quarantining, had mobility limitations, or were facing time pressures. But understanding the pathways to adopting new technologies is important in promoting resiliency and self-sufficiency, even if it remains a supplementary—rather than primary—means of grocery shopping. The dataset collected here and made publicly available can help to provide additional insights into the household-level associations between consumer choices and local pandemic conditions, considering how preferences, socio-demographics, and local accessibility interact to inform provisioning outcomes.

1.0 INTRODUCTION

In response to the COVID-19 crisis, many households have been forced to curb out-of-home activities and trip making, including changing their approaches to shopping for food and other household items (Bounie et al., 2020). Retailers have changed their hours of operation, introduced curbside pick-up and delivery, and limited the density of customers permitted in stores. In many cities, transit services have been cut and riders are concerned about using them. As a result, many consumers have modified their behaviors, such as changing preferred store locations, making trips to stores less frequently, buying more per trip, and changing transportation modes. E-commerce and delivery platform technologies have the potential to help facilitate social distancing practices and increase access to opportunities. The pandemic has accelerated adoption of online and in-app ordering and delivery services for provisioning purposes, but the subsequent change in household provisioning behavior is not well understood, particularly among communities experiencing the greatest challenges.

The strategies used for household provisioning during this pandemic crisis and recovery are likely uneven, as is the community response to the virus itself. Evidence from Google Community Mobility reports from the early stages of the pandemic illustrated how responses from the norm vary by locations (see **Figure 1.1** for an example from Google Mobility Reports). Households in various population groups have different resources, preferences, and barriers; accessibility to retail establishments varies by location; retailers and food outlets fluctuate in their ability to shift operations; and e-commerce and delivery service platforms are not deployed uniformly within and across cities.

Thus, the primary objectives of this study were to: 1) evaluate the extent to which people can and do modify their behavior, either by choice or necessity, to meet their provisioning needs during the ongoing COVID-19 pandemic; 2) identify the barriers that some groups face in accessing goods; and 3) understand the lasting effects of technological adoption and provisioning changes during recovery and beyond. To this end, we had three research questions:

> **Q1.** How do people access essential goods during the pandemic crisis and recovery periods (online or in person, brick-and-mortar, local or major supply chains, delivery, or pick up)?
>
> **Q2.** What barriers have certain subgroups faced in accessing essential goods?
>
> **Q3.** To what extent do/can online platforms help?

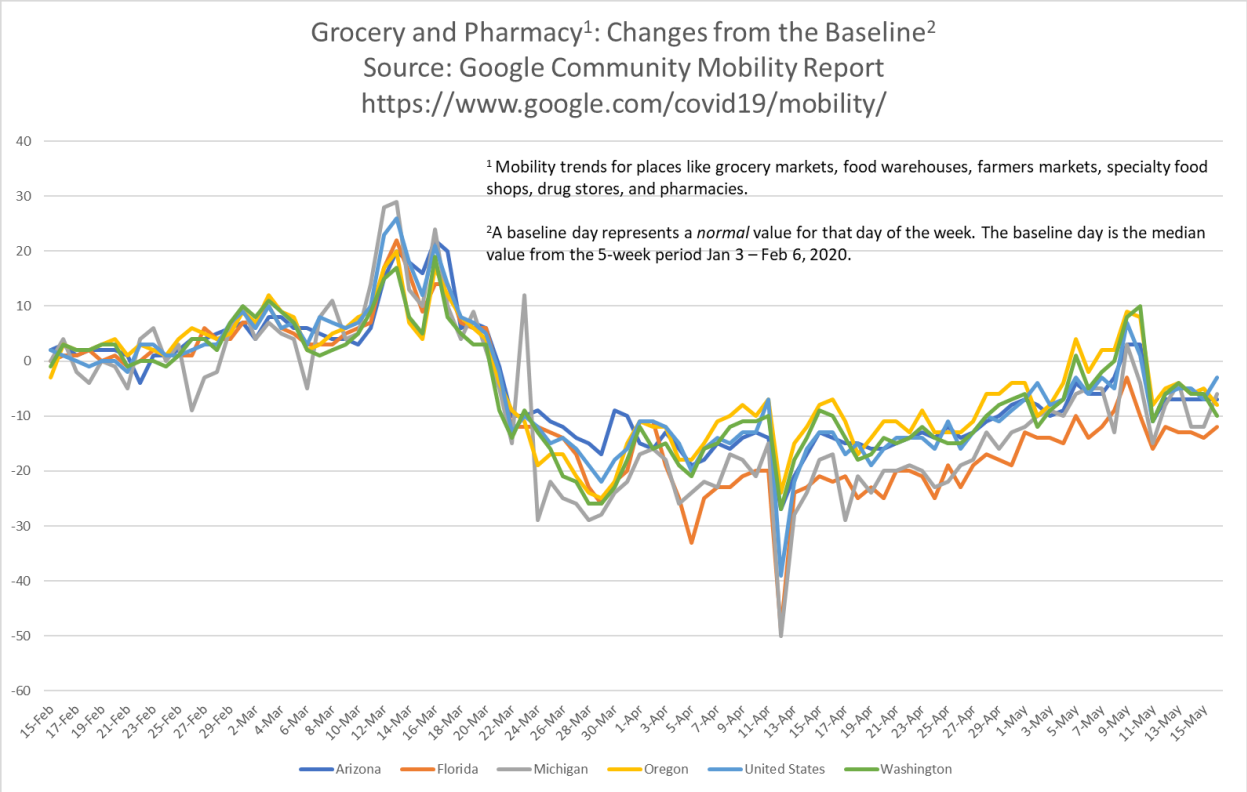


Figure 1.1 Google Mobility Report grocery and pharmacy activities by state between February 15 and May 15, 2020

Alt Text: A graph produced using Google Mobility Report data between February 15 and May 15, 2020, shows how grocery and pharmacy activities deviate from the baseline. A baseline day represents a normal value for that day of the week and is calculated using the median value from the five-week period Jan 3 – Feb 6, 2020. Grocery and pharmacy activity surged between March 12 and March 20 before dropping well below the baseline beginning around March 24. Grocery and pharmacy activities hit their lowest point on April 13, 2020, before starting to return closer to the baseline. The graph presents the trends for Arizona, Florida, Michigan, Oregon, Washington, and the United States as a whole and the trend lines are similar.

The pandemic offered a unique opportunity to observe how households respond to this crisis as local, state, and federal governments impose and lift restrictions, brick-and-mortar establishments close and potentially reopen, and e-commerce and delivery services adjust. The overall goal of this project was to capture changing behavioral responses over the course of the pandemic and subsequent recovery. To meet this goal and address the research questions identified above, the research design relied on three key approaches:

- Four waves of repeated cross-sectional surveys (online) of households in five states about their household provisioning strategies. These surveys took place in September/October 2020, February/March 2021, June-September 2021, and September-November 2021.

- Qualitative interviews or focus groups with older adults who have used online grocery shopping or delivery platforms during the pandemic.
- Focus groups with adults who have mentored or helped friends or family members use online platforms to acquire food during the pandemic, including households that do not speak English at home.

This project built upon a National Science Foundation RAPID grant (Award #2030205, PI Clifton; Co-PI Lewis) that funded four waves of online surveys in three states (Washington, Michigan, and Florida).This NITC project complemented this work in two important ways: a) expanded data collection to include Oregon and Arizona, and b) included a qualitative component to understand the arc of e-commerce adoption for older adults, who face challenges in physical travel to the stores as well as digital access to online shopping.

The major research deliverable from these two projects is the four waves of publicly available data collected from this study. These data provide a rich resource to examine changes in food shopping behaviors, attitudes, and outcomes over the course of the pandemic at an individual household level. Because of this large volume of data, this report will not be a comprehensive accounting of all findings, but rather present high-level descriptives and comparisons.

Also, because these projects are complementary, we will focus this report on overall pooled trends and state-level comparisons of the survey data and the qualitative component. The NSF report will also be available publicly. As such, the remainder of this report is structured as follows. The Background section presents an overview of the literature on grocery shopping and the adoption of e-commerce technologies. In addition, the context of the pandemic over the course of this study is presented in terms of COVID incidence rate, deaths, vaccinations, and policies by state from March 2020 to November 2021. Then, the overall survey research design is described, including survey design, implementation, and weighting. Next, high-level results from the survey data are reported, focusing on state comparisons and overall trends around in-store and online grocery shopping. The design, conduct, analysis, and findings of the focus groups with older adults and persons assisting family members are presented in their own section. The report concludes with implications for food security planning and the future of online grocery shopping.

2.0 BACKGROUND

2.1 HOUSEHOLD PROVISIONING BEHAVIOR PRE-COVID-19

While households vary in their approach to household provisioning in terms of how often they shop, where they shop, and how much they spend, one thing that typically has not varied is *how* households acquire provisions—by physically traveling to a retailer or other food outlet (Jones & Kashanchi, 2019; Semuels, 2019). The option to order groceries online for delivery has been available, at least in some areas, since as long as ago as 1989 when the grocery delivery company Peapod first started offering the service (Semuels, 2019). By the early 2000s, major retailers like Safeway and Albertson's had begun to offer grocery delivery as a service in select markets with an eye to continued expansion (Tedeschi, 2002). Despite the continued maturation of the e-commerce market, the adoption and growth of e-grocery has been slow compared to other retail segments. Consumers have shown a propensity to order durables (e.g., electronics, clothing, etc.) online, but have been less likely to order consumables, such as food items (Nielsen, 2017; Semuels, 2019). And from a retailing standpoint, the perishable nature of some grocery items means that the logistics of storage and delivery are complicated, slowing the growth of the market compared to other e-commerce retail (Livingstone & Knezevic, 2020).

In the latter half of the 2010s, options for online grocery ordering expanded significantly with Amazon's acquisition of Whole Foods in 2017 and other major retailers, including Target and Walmart, responding accordingly (Semuels, 2019; Wingfield & Merced, 2017). This same period also saw the emergence and expansion of app-based food delivery platforms like Instacart, UberEats, Doordash, and others, as well as meal kit services such as Blue Apron and HelloFresh. Despite the market growth, e-grocery adoption and usage rates remained low pre-COVID-19. A poll conducted by Gallup in 2019 asked respondents to report the frequency with which they use online methods to acquire food, and over 80% said they never ordered groceries online for pick up or delivery (Jones & Kashanchi, 2019). Seven percent reported ordering groceries online occasionally, but less frequently than once a month, while an additional 7% indicated they did so about once a month. Just 5% reported doing it as frequently as once a week (Jones & Kashanchi, 2019). In contrast, 83% of respondents reported going to shop for groceries in person *at least* as often as once per week. Sixteen percent reported shopping in person less frequently—about once a month or less—but just 1%said they never shopped in person for groceries (Jones & Kashanchi, 2019).

The next section explores some of the explanatory factors that influence adoption and usage of e-commerce and e-grocery, followed by a review of preliminary findings on how the COVID-19 pandemic has impacted household provisioning behavior.

2.2 FACTORS INFLUENCING ADOPTION AND USE OF E-COMMERCE AND E-GROCERY[1]

Researchers examining the adoption and use of e-commerce generally, and e-grocery specifically, have found that a wide variety of factors influence adoption and use. In an evaluation of general e-commerce adoption, Naseri & Elliott (2011) found that e-commerce adopters are more likely to be young, male, highly educated, and high income. While Dominici et al. (2021) reported the same trends for income, age, and education specifically with respect to online grocery shopping, they said e-grocery shoppers were more likely to be women than men. Men are more likely to shop online in general (Droogenbroeck & Hove, 2017), although women may be more likely to shop both in-store and online (Jaller & Pahwa, 2020)—perhaps because they do more of household provisioning in general (Southerton, 2006). Larger households, particularly those with children, have been linked with more frequent online provisioning habits (Jaller & Pahwa, 2020). Household vehicle ownership has been associated with preferences for in-store food shopping as opposed to online food shopping (Dominici et al., 2021).

Droogenbroeck and Hove (2017) examined e-grocery adoption through surveys regarding use of Collect & Go, a Belgian grocery pick-up service with online ordering. The authors found associations between both household- and individual-level characteristics, including age, education level, and presence of children. The authors found the models including both individual- and household-level characteristics to have higher predictive power compared to models that only include individual characteristics, bolstering the argument that both are important when assessing adoption of e-grocery services.

Additional fees associated with online ordering methods have proved to be a barrier to adoption for low-income households (Rummo et al., 2020). A recent analysis of residents in Portland, OR, demonstrated that Hispanic-Latino-identifying populations and people with lower educational attainment were less likely to receive deliveries during COVID-19, while low-income households and households with members over 65 were less likely to be subscribed to a delivery subscription service (Figliozzi & Unnikrishnan, 2021).

Age is a commonly cited factor in the digital divide, as older Americans' internet usage is increasing but still falls behind rates of other adults (Pew Research Center, 2021). Twenty-five percent of adults 65 and older never use the internet, compared to 4% of 50-64 year olds, 2% of 30-49 year olds, and 1% of 18-29 year olds (Perrin & Atske,

[1]This section is taken directly from Gabriella Abou-Zeid's master's thesis "Adoption and Use of E-Grocery Shopping in the Context of the COVID-19 Pandemic: Implications for Transport Systems and Beyond" (Abou-Zeid, 2021).

2021). Barriers associated with this group include (non-)ease of use, lack of knowledge of availability, and lack of technical support (Lee & Coughlin, 2015).

Major discrepancies in adoption of technologies exist across income groups, too. Higher incomes typically correspond with higher rates of online shopping (Droogenbroeck & Hove, 2017; Farag et al., 2007). Recent findings from the Pew Research Center show striking differences in adoption of internet-related technologies by income (Vogels, 2021). For example, while 93% of households earning $100,000 or more have broadband internet at home, only 57% of those earning less than $30,000 do. Further, 92% of households earning $100,000 or more have a computer at home, compared to 84% of households with $30,000-$99,999 incomes and 59% of households with income under $30,000. Fourteen percent of households earning less than $30,000 report not using the internet at all, compared to just 1% of those earning $75,000 or more and 2% earning $50,000-$75,000 (Perrin & Atske, 2021). Income has been used as a moderating variable in analyses examining technology adoption (Brown & Venkatesh, 2005; Chawla & Joshi, 2018).

Built environment factors also play a role in the adoption (and use) of technologies. Residents of densely populated cities are more likely to exclusively shop online (Jaller & Pahwa, 2020); this may be in part due to better access to the internet (Farag et al., 2007) or due to the increased access to stores and restaurants offering online ordering methods. In a study of Belgian shoppers, Beckers et al. (2018) noted that dense neighborhoods with high incomes and levels of education are expected to have higher numbers of online shoppers. Chen et al. (2020) found telehealth adoption rates trend positively with increasingly urban contexts. E-commerce and freight research have demonstrated a positive association between population density or urban context and online shopping (Cheng et al., 2021; Farag et al., 2007).

Unsurprisingly, attitudes have been found to be significant indicators of e-commerce use in previous analysis of general and grocery online shopping (Droogenbroeck & Hove, 2017; Farag et al., 2007; McCloskey, 2006; Mehrolia et al., 2021). Using 1,580 survey responses of Danish e-commerce users—24% of whom had ordered groceries online—Frank and Peschel (2020) developed a binary logit model to examine e-grocery adoption, as well as cluster analysis to develop e-grocery shopper typologies. The authors found that, when controlling for demographics, perceived social norm, compatibility with in-store shopping, and perceived advantage over in-store shopping are significant and positive predictors of online grocery shopping adoption. Further, the authors identify three segments of online shoppers, whose main priorities are 1) price, 2) time, and 3) trust/brand awareness. Features used to classify shoppers included e-grocery costs, products available, delivery speed and accuracy, time savings, times available to shop, personal service, and brand name. While no significant differences existed across groups in e-grocery shopping frequency, the authors noted the segment associated with price consciousness held the greatest share of weekly grocery shoppers.

Huang and Oppewal (2006) employed a choice experiment of U.K. consumers. Their sample was built using intercept surveys of 152 grocery shoppers; under a quarter of these shoppers had previous experience shopping online for groceries. The authors hypothesized delivery costs would be the major factor affecting grocery shopping mode. However, their analysis revealed the effect on shopping mode choice of a 15-minute travel time increase was almost double that of a delivery fee increasing from zero to five pounds (roughly $6.90 USD). Factors associated with perceived costs, risks, convenience, and enjoyment were also found to influence the choice to shop online (or not). Hansen et al. (2005) found compatibility with existing shopping behaviors, perceived advantages over in-store shopping, affirmative social norms, and low risk and complexity related to the internet to differentiate e-grocery adopters from non-adopters. Piroth et al. (2020) also found social norms to be a strong predictor of e-grocery adoption, while Hand et al. (2009) noted level of satisfaction with shopping channels is an indicator of grocery adoption and continued use.

Singh and Rosengren (2020) provided an overview of switching *between* e-grocery retailers. Using 221 survey responses of e-grocery shoppers and structural equation modeling, the authors noted that poor customer service and item quality, along with high costs and technical problems with online platforms, are significant factors that push consumers to switch to other online retailers in their grocery shopping. Further, positive word of mouth about a particular online retailer and the availability of alternative products are significant in attracting consumers toward an online retailer. It is plausible that these factors attracting or detracting consumers between online retailers also influence adoption and continued use of e-grocery services when switching from traditional in-store shopping.

This background literature on the factors influencing adoption and use of e-commerce and e-grocery informed the research design and the variables and questions we asked in our survey instruments, as well as our approach to the qualitative work. The survey findings to follow in later sections do not fully explore the demographic and spatial factors that may impact adoption of e-commerce in detail, but these factors will be analyzed further in future work.

2.3 COVID-19 IMPACTS ON HOUSEHOLD PROVISIONING[2]

The onset of the COVID-19 pandemic brought considerable changes to household provisioning patterns. Initial perceptions of food scarcity, increased unemployment, and the closure of many restaurants caused household food purchasing patterns to shift towards lower-priced foods with greater shelf life, the stockpiling of products, and a greater capacity—and necessity—for meal planning and preparation (Ellison et al.,

[2] This section is adapted from Gabriella Abou-Zeid's master thesis "Adoption and Use of E-Grocery Shopping in the Context of the COVID-19 Pandemic: Implications for Transport Systems and Beyond" (Abou-Zeid, 2021) and Max Nonnamaker's capstone research paper "Leave It by the Door: Household Shopping Preferences During the Pandemic Era and Balancing E-Grocery and In-store Trade-offs" (Nonnamaker, 2022).

2021). Research during the early pandemic period also reports a significant increase in the proportion of households using e-grocery services and meal delivery services (Ellison et al., 2021). This shift to e-grocery shopping, in addition to ordering meals online as restaurants halted dine-in services, resulted in a 700% increase in online food orders in the U.S. during the first quarter of 2020 compared to the same time in the previous year (Alaimo et al., 2020).

While demand for online ordering spiked in the early months of the pandemic, it is yet unclear if changes made by households and individuals to their grocery shopping behaviors in response to the pandemic will prevail. Initial increases in demand volume at onset of the pandemic challenged retailers, at times resulting in product depletion, long queues, and delayed delivery windows (Asti et al., 2021), negatively impacting user experience and satisfaction. Additionally, not being able to see the products being purchased complicates the food selection process and acts as a deterrent for some, making e-grocery shopping seem more complex or less easy to use (Alaimo et al., 2020). Research has also identified that the shift to e-grocery shopping follows COVID-19 incidence rates, increasing during more contagious periods, and stagnating and decreasing as new cases diminish (Grashuis et al., 2020).

Hand et al. (2009) found that major life events, like the birth of a child or health issues, can also trigger the adoption of online grocery shopping. However, the authors reported that after these events pass, there may be a reversal of adoption behavior. In a nationally representative survey examining behavioral “stickiness” around the pandemic, Salon et al. (2021) found the share of U.S. residents who shop online a few times a month to increase from 21% pre-pandemic to 30% post-pandemic (based on consumer expectations). In-store shopping, however, is likely the predominant mode, with 90% of respondents reporting that they expected to shop in-store a few times a month (Salon et al., 2021).

While e-grocery services may not replace in-store shopping, it has the potential to change the frequency of store visits (Salon et al., 2021), and yield substantial changes to how households access food. A study conducted by The Food Industry Association showed 89% of surveyed consumers made changes to the way they grocery shop, noting spending on groceries online likely doubled during the pandemic (Redman, 2020). While market penetration of e-grocery services is still fairly low, it may hit 55%-66% by 2024, depending on COVID-19 recovery (Keyes, 2021).

2.4 THE COVID CONTEXT

In the initial days and weeks after the World Health Organization first declared COVID-19 a pandemic on March 11, 2020, most U.S. states were tracking similarly in terms of statewide policies and closures. The governors of all five states included in this analysis—Arizona, Florida, Michigan, Oregon, and Washington—had ordered the temporary closure of schools by March 17, 2020 (Johns Hopkins University & Medicine, n.d.-b, n.d.-a, n.d.-c, n.d.-d, n.d.-e). In the days following, they also issued limitations on the size of gatherings and ordered the closure of non-essential businesses, and by April

2, residents in all five states were under statewide stay-at-home orders (Johns Hopkins University & Medicine, n.d.-b, n.d.-a, n.d.-c, n.d.-d, n.d.-e).

By May, however, policies began to diverge as some governors allowed the easing of restrictions sooner than others. Governor Ducey of Arizona, for instance, permitted the partial reopening of retail businesses statewide beginning May 2, 2020, while Governor DeSantis of Florida announced that businesses in all 67 counties could begin reopening May 18, 2020 (Johns Hopkins University & Medicine, n.d.-a, n.d.-b). Governor Whitmer of Michigan, Governor Brown of Oregon, and Governor Inslee of Washington took a more regional approach allowing phased reopening in specific areas based on daily incidence and hospitalization rates beginning in mid-May (Johns Hopkins University & Medicine, n.d.-c, n.d.-d, n.d.-e).

From June 2020 onwards, policies across the five states varied widely and the COVID-19 context was continuously in flux, changing not only from week to week but also state to state. Statewide face masking mandates were enacted in Michigan, Oregon, and Washington by mid-July to help prevent the spread of COVID-19, while Arizona's Governor Ducey deferred to local governments on masking policies (Johns Hopkins University & Medicine, n.d.-a, n.d.-c, n.d.-d, n.d.-e). No masking policies were enacted in Florida (Johns Hopkins University & Medicine, n.d.-b).

While all five states experienced surges in daily average case counts at some point during data collection, these surges occurred at different times and at varying levels of magnitude. **Figure 2.1** shows the total daily average case counts between September 2020 and November 2021 across the five states, while **Figure 2.2** shows the same data normalized by population size. As is visible from both graphs, Michigan experienced three distinct surges during our study period, while Arizona experienced one significant surge between December and February 2021 when cases were on the rise in all five states. The Delta variant contributed to a surge in the late summer and early fall of 2021 across the U.S., although the caseload was highest in Florida even after accounting for population size. Caseloads were consistently the lowest relative to population size in Oregon and Washington throughout the study period, though they followed the same trends overall.

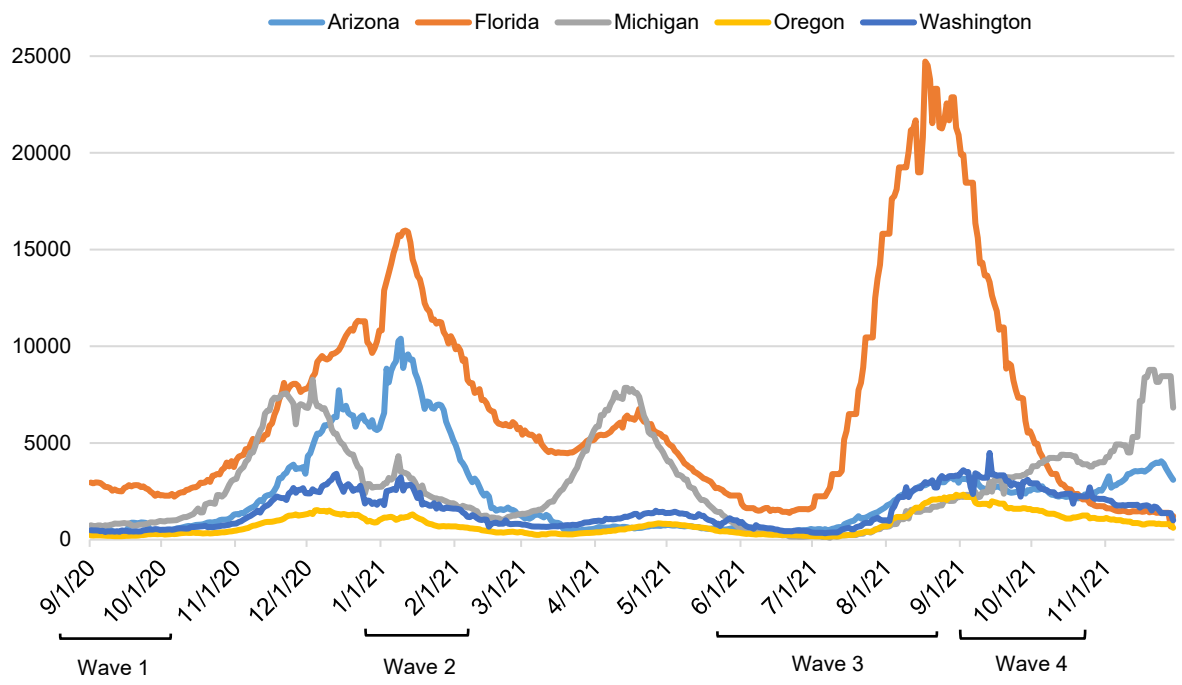


Figure 2.1 Daily case averages from Sep 1, 2020 - Nov 30, 2021 (7-day trailing average)
Source: Data from The New York Times, based on reports from state and local health agencies.

Alt Text: Using data compiled The New York Times, this graph shows daily average case counts between September 1, 2020 and November 30, 2021 in the five states we analyzed. We collected survey data at four points throughout this period (Sep – Oct 2020; Jan – Feb 2021; Jun – Sep 2021; & Sep – Oct 2021).

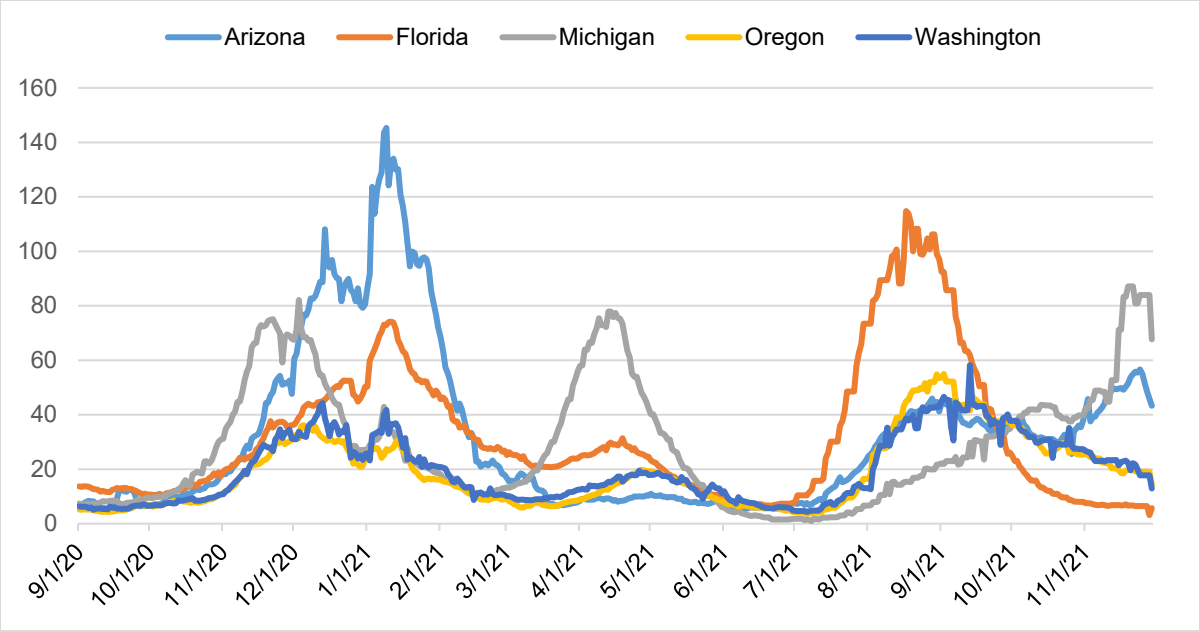


Figure 2.2 Daily case averages from Sep 1, 2020 - Nov 30, 2021 (per 100,000)
Source: Data from The New York Times, based on reports from state and local health agencies.

Alt Text: Using data compiled by The New York Times, this graph shows daily average case counts per 100,000 between September 1, 2020, and November 30, 2021, in the five states we analyzed. When we compare this data while accounting for population size, we see that Arizona had the highest relative case count across the five states in Jan-Feb 2021, while Michigan experienced a surge in Apr-May 2021. Case counts were rising in all five states Aug-Sep 2021, though the highest relative case count was in Florida.

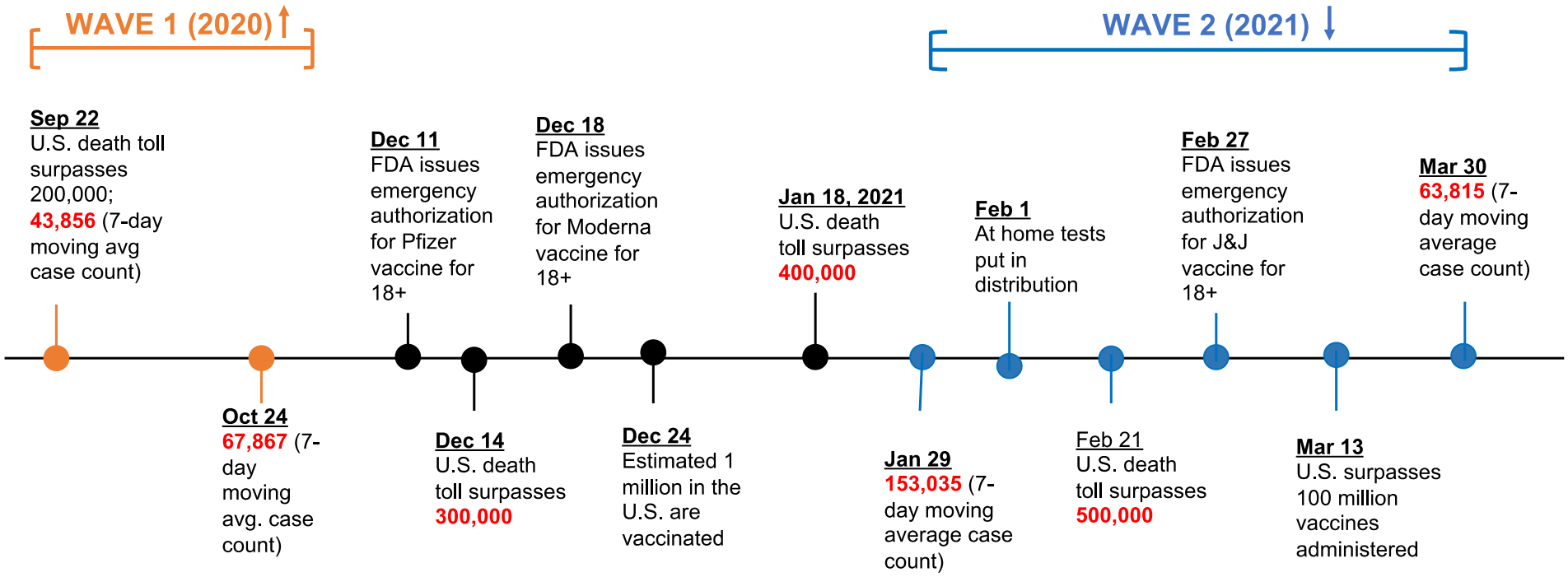
While case counts and statewide policies were changing over the course of our data collection efforts, so too was the availability of vaccines and at-home tests. The first vaccines were granted emergency authorization by the Federal Drug Administration (FDA) in December 2020, with an estimated 1 million people vaccinated nationally by December 24, 2020 (CDC, 2022). The second survey wave, which was fielded between January and March 2021. captured the early impacts of vaccine availability, as well as the beginning of at-home testing in February. **Figure 2.3** and **Figure 2.4** shows a timeline of key events between September 2020 and November 2021. The national daily average case counts are noted in red. Arrows next to the wave names indicate whether cases were rising or falling nationally while the survey was being fielded. (Note that the timeline is not to scale.) Source: Data from the CDC.

By the time we were fielding our final survey wave in October/November 2021, the COVID-19 pandemic was ongoing but the governors in all five states had rescinded most statewide policies. Only Oregon and Washington continued to have a statewide mask mandate in effect during Wave 4. There were no limitations on gatherings by that time, and restaurants, bars, and retail establishments were fully open. Vaccination rates were highest in Oregon and Washington by the end of November. **Table 2.1** shows a summary of the statewide policies in place across the four waves.

Table 2.1 Statewide policies in place during data collection

	Arizona	Florida	Michigan	Oregon	Washington
Wave 1 (Sep-Oct 2020)					
Statewide Mask Mandate	Schools	No	Yes	Yes	Yes
Limits on Gatherings	No	No	Yes	Yes	Yes
Status of Restaurant/Retail	Open with Capacity Limitations	Fully Open as of Sep. 25	Partially Open by Region	Partially Open by Region	Partially Open by Region
Wave 2 (Jan-Mar 2021)					
Statewide Mask Mandate	Schools	No	Yes	Yes	Yes
Limits on Gatherings	No	No	Yes	Yes	Yes
Status of Restaurant/Retail	Open with Capacity Limitations	Open	Open with Capacity Limitations	Partially Open by Region	Partially Open by Region
Wave 3 (Jun-Sep 2021)					
Statewide Mask Mandate	No	No	No	No	Yes
Limits on Gatherings	No	No	Lifted as of July 1	Lifted as of June 30	Lifted as of June 30
Status of Restaurant/Retail	Open	Open	Open	Fully Open as of June 30	Fully Open as of June 30
Wave 4 (Sep-Nov 2021)					
Statewide Mask Mandate	No	No	No	Yes	Yes
Limits on Gatherings	No	No	No	No	No
Status of Restaurant/Retail	Open	Open	Open	Open	Open

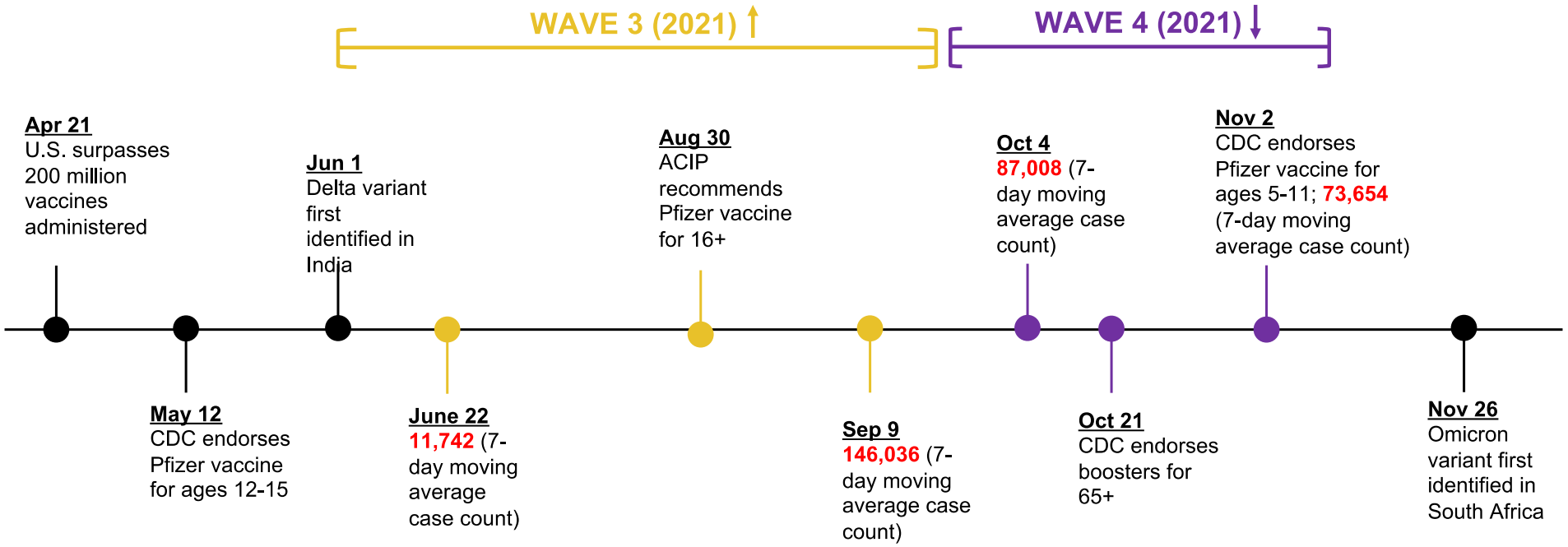
Sources: John Hopkins University Coronavirus Resource Center, Office of the Governor Doug Ducey, State of Oregon Newsroom, Washington State Coronavirus Response



National daily average case counts are noted in red. Arrows next to the wave names indicate whether cases were rising or falling nationally while the survey was being fielded. (Note that the timeline is not to scale.) Source: Data from the CDC.

Figure 2.2 Timeline of key milestones between Sep 2020 and Mar 2021 corresponding with the waves of data collection over this time period

Alt Text: This figure shows a timeline of key COVID-19-related milestones between September 2020 and March 2021 with the corresponding waves of data collection over this time period noted. During the first wave of data collection, daily average case counts were rising nationally. In December 2021, the FDA issued emergency authorization for the Moderna and Pfizer vaccines. Daily average case counts were decreasing nationally during our second wave of data collection and by March 13, 2021, more than 100 million vaccines had been administered.



National daily average case counts are noted in red. Arrows next to the wave names indicate whether cases were rising or falling nationally while the survey was being fielded. (Note that the timeline is not to scale.) Source: Data from the CDC.

Figure 2.3 Timeline of milestones between Apr 2021 and Nov 2021 corresponding with the waves of data collection over this time period

Alt Text: This figure shows a timeline of key COVID-19-related milestones between April 2021 and November 2021 with the corresponding waves of data collection over this time period noted. During the third wave of data collection, daily average case counts were rising nationally. The Delta variant was first identified in India on June 1, 2021. Daily average case counts were decreasing nationally during our fourth wave of data collection. The Omicron variant was first identified at the end of November, just after we had completed our fourth and final wave.

3.0 SURVEY RESEARCH DESIGN

This project employed a multimethod research approach. To understand the attitudes, resources, and behavioral outcomes of individual households, an online survey was administered by the survey firm Qualtrics to their pre-recruited panel based upon sampling criteria. The details of the survey design, including the sampling frame, survey instrument, and weights are described below. The qualitative component is described in Section 5.0 Focus Groups.

Four waves of repeated, cross-sectional surveys were administered online in Arizona, Florida, Michigan, Oregon, and Washington starting in September 2020 and finishing in November 2021. Washington, Michigan, and Florida were selected for inclusion in the initial NSF study because of their approach to the pandemic, their variations in availability of online grocery ordering and delivery platforms, and demographic variations.

Washington was the location of the first confirmed COVID-19 case in the U.S. and developed a coordinated statewide response. Florida, on the other hand, banned mask mandates at the statewide level and adopted a laissez-faire approach to government policy during the pandemic. Michigan falls somewhere in between the two, with several public health initiatives to combat the spread of the virus. Oregon and Arizona were added as a part of the NITC grant to increase the socio-economic diversity, their variations in access to online ordering, and different political perspectives between and within each state. As the local states for the lead PIs, there was also the opportunity to use local connections to facilitate focus groups.

The survey was collected using Qualtrics' online platform and administered by Qualtrics using their General Population pre-recruited panels. Respondents had to be a minimum of 18 years old and primarily responsible for (or share responsibility for) the food and grocery shopping for the household. Each state had a target sample of 750, with minimum quotas of 30 set for each of the subcategories in these characteristics: household size (1, 2, and 3+), age (18-64, 65+), and income ($0-39K, $40k-79k, and $80k+). The zip code of each household was recorded and used to augment with additional spatial data.

Each wave of this survey captured:

- Household socio-demographics, composition, and resources;
- Shopping preferences (pre-COVID-19) and behaviors, including frequency, locations, mode of transportation, and use of e-commerce and delivery;
- Current shopping behaviors; and
- Barriers to access and impacts on household provisioning and wellbeing.

The questionnaires for each wave can be found on PDX Scholar (Clifton et al., 2022). Wave 1 took a detailed approach to collecting information about the type of store(s) households were shopping, frequency of use, and mode of transportation. After data collection was completed, we redesigned the survey questionnaire to simplify this process. The questionnaires in Waves 2, 3, and 4 have a consistent survey design, with Wave 4 re-adding some questions from the Wave 1 questionnaire. Each survey had a targeted completion duration of 18 minutes.

Surveys were subject to several quality checks including completeness, minimum time to take the survey (omitting "speeders"), inconsistencies or straight lining in responses, and a question embedded for attentiveness.

In **Appendix 8.2** Survey Respondents, **Table 8.1** shows the dates and final sample sizes by state after data were cleaned. In the same **Appendix 8.2**, **Table 8.2** through **Table 8.8** show the basic descriptive statistics of the unweighted sample for each wave of the survey by state for the following characteristics:

- Gender of respondent
- Race/ethnicity of respondent
- Household size
- Household income
- Presence of adults 65+ in the household
- Presence of children under 18 in the household
- Number of workers in the household

Maps showing the relative locations of respondents, pooled over the four waves, are also shown in **Appendix 8.2** in **Figure 8.1** through **Figure 8.5**.

These survey data were also augmented with other archived data using the state, county, or zip code of the respondent. These data include:

- COVID incidence rates and death rates at the county level (*The New York Times*, 2021);
- Vaccination rates at the county level (CDC, 2022);
- State-level policies including mask mandates, stay-at-home orders, limits on gatherings (CDC, n.d.-b, n.d.-a, 2021); and
- Grocery store accessibility measures (USDA Economic Research Service, 2021).

Variables were renamed using more intuitive terms, and variables with comparable information across waves were given the same name. Multiple choice or select-all-that-apply questions were also recoded so that individual items were given their unique variable name for ease of use. Lastly, qualitative responses were stripped of personally identifiable information and, where possible, "other" responses were manually recoded in accordance with the survey question.

Finally, the data from each wave were weighted to correct for bias in the sample distribution and expanded to reflect the state population characteristics for each state. In this process, we selected three variables to consider as part of our weighting process: household income, household size, and the presence of children in the household. An iterative proportional fitting process was used to derive the weights and is explained in more detail in **Appendix 8.3** Survey Weighting.

As these data are a major deliverable of this project, the survey data, questionnaires and the data dictionary are made publicly available. These data can be found archived on PDX Scholar (Clifton et al., 2022).

4.0 SURVEY FINDINGS

This section organizes our findings from the survey around the three main research questions that motivate this work:

1. How do people access essential goods during the pandemic crisis and recovery periods?
2. What barriers have certain subgroups faced in accessing essential goods?
3. To what extent do/can online platforms help meet this demand?

The analysis of the survey data focuses on aggregated results as well as state by state comparisons, where appropriate.

4.1 HOW DO HOUSEHOLDS ACCESS ESSENTIAL GOODS DURING THE PANDEMIC CRISIS AND RECOVERY PERIODS?

Over the course of the pandemic, the majority of shoppers continued to travel to grocery stores and supermarkets and shop in-store as their primary means of acquiring goods and other household items. We base this finding upon the percentages of people engaging in in-store and online shopping and the frequency of shopping events. Because information about expenditures was not collected, we cannot comment on the relative amounts purchased.

Figure 4.1 below shows the changes in in-store grocery shopping over the four waves of the survey from September 2020 to November 2021 from the pooled and weighted results from the five states. As a reminder about the COVID context during this time, Wave 1 data were collected in fall 2020 before vaccines were available and the U.S. had been experiencing the pandemic for six months or more. By Wave 2, essential workers and vulnerable populations were starting to get vaccinated. Wave 3 took place in the summer of 2021 when most of the adult population in the U.S. could access vaccines if desired. Cases were down in June 2021 to the lowest point over our study period. The Delta variant took hold just at the beginning of Wave 3 and, by the end of our survey, cases had surged again. This wave took the longest amount of time to reach the target sample size. Thus, Wave 4 quickly followed in the fall as booster shots started becoming available for essential workers and older adults.

Most notable are the changes on the far right of the bar chart in **Figure 4.1**—the percentage of households that did not engage in shopping in a grocery store during the four weeks prior to the survey. During Wave 1 of the survey, which occurred before vaccines were available, over 11% of households were not engaging in in-store shopping. The proportion of households who were not engaging in any in-store declined over the four waves to just under 3% by Wave 4, despite weekly case counts exceeding

those in Wave 1. The availability of vaccines may have emboldened many to return to in-store shopping as fears of severe consequences from catching COVID were allayed.

Similarly, and on the other end of the spectrum, there was a significant increase in the percentage of in-store shoppers who were going once a week or more by Wave 4, totaling around 84%. A Gallup poll conducted in 2019 indicated that 83% of Americans were shopping in-store once per week or more (Jones & Kashanchi, 2019). While the Gallup poll is an imperfect comparison[3], the results point to a return to pre-COVID levels and suggest consumers were feeling more confident in in-store shopping.

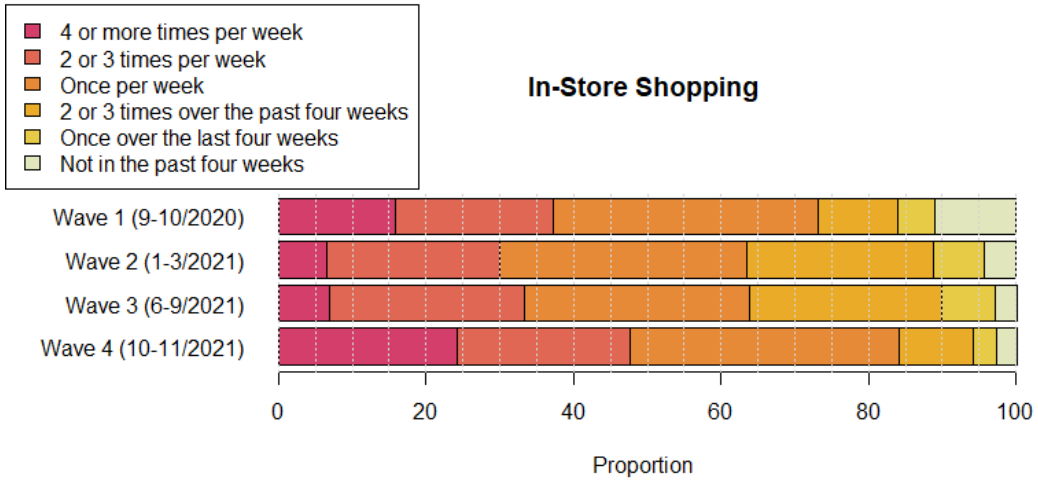


Figure 4.1 In-store grocery shopping frequency across all survey waves (pooled)

Alt Text: This graph shows in-store grocery frequency across the four survey waves. Results from all five states are presented pooled. Frequency categories include: four or more times per week; two or three times per week; once per week; two or three times over the past four weeks; once over the last four weeks; and not in the past four weeks.

Figure 4.2 shows the state comparisons by wave for in-store shopping. In general, the overall trends hold at the state level despite differences in the incidence of and responses to COVID. In general, Michigan tends to have lower grocery frequencies overall. But the differences are not great and there is no obvious correlation with COVID cases.

[3] The Gallup survey was nationwide, albeit with smaller samples, and a slightly different question wording.

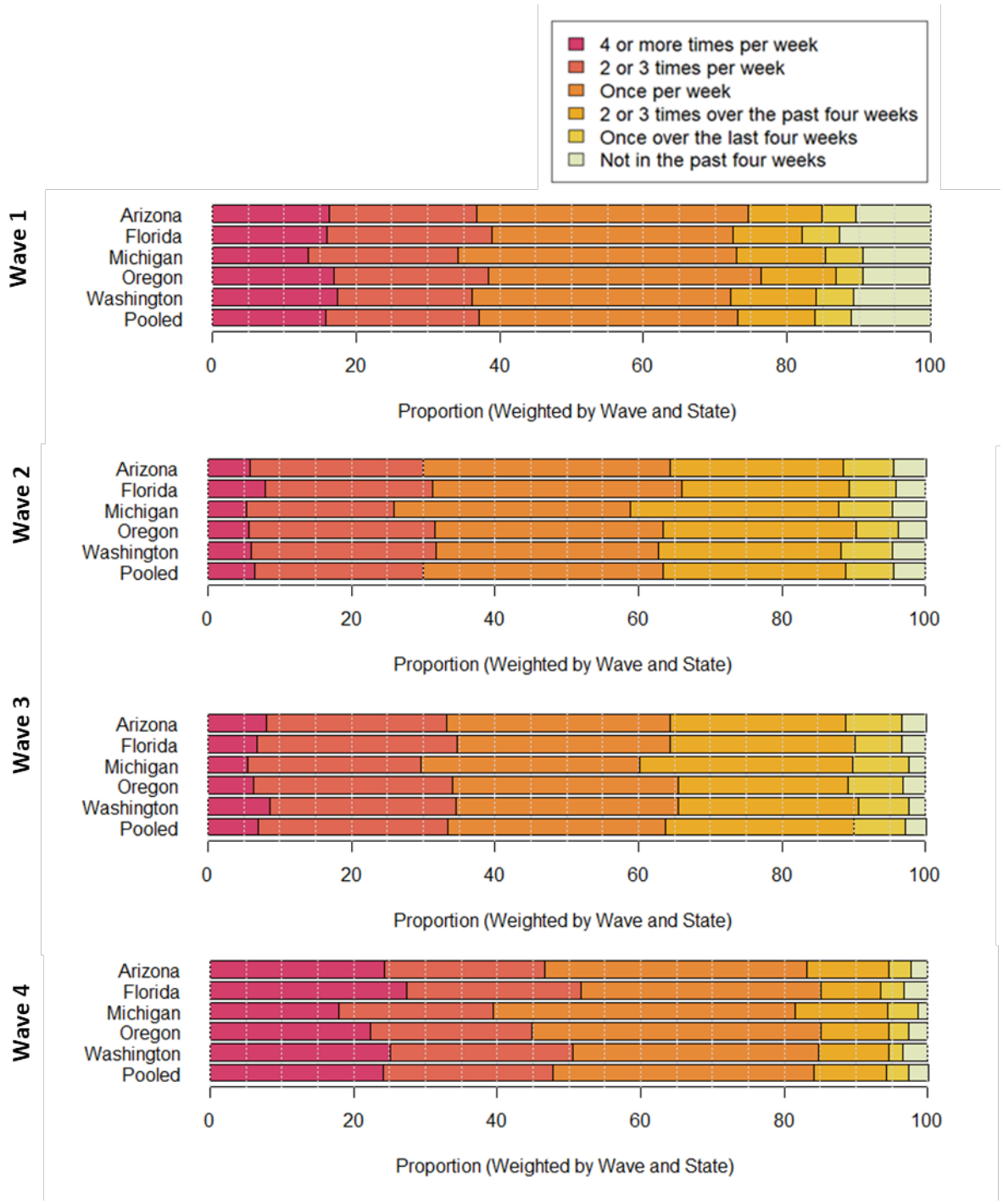


Figure 4.2 In-store grocery shopping frequency (by state)

Alt Text: Four graphs show in-store grocery shopping frequency with results presented by wave and by state. Frequency categories include: four or more times per week; two or three times per week; once per week; two or three times over the past four weeks; once over the last four weeks; and not in the past four weeks. Data are weighted by wave and by state.

Online grocery shopping trends are shown in **Figure 4.3** and **Figure 4.4** for the pooled sample and by states, respectively. There is less variation in online shopping incidence over the four waves than with in-store shopping activities. However, there is a marked increase in the number of people reporting some online grocery shopping activity over the four weeks prior to the survey between Wave 1 (~39%) and the subsequent waves (~44-45%). The proportions engaging in online shopping are smaller compared to in-store shopping frequencies. However, they show a notable increase compared to information from a Gallup poll in 2019, where 81% of respondents said they never ordered groceries online for pick-up or delivery (Jones & Kashanchi, 2019). This points to COVID as a catalyst for initiating online grocery shopping for many consumers, but also its complementarity with in-store shopping. Because it is not the primary mode of shopping for most households it cannot be considered a substitute for in-store shopping. However, an in-depth analysis of individual behaviors is needed to understand more about substitution/complementarity and who is adopting online shopping.

At the state level, Washington and Arizona households were using online shopping more in Wave 1. Shoppers in Michigan and Oregon lag in the percentage of people engaging in online grocery shopping. In Oregon's case, the COVID cases were lower in absolute terms than the other states in the study. Washington's COVID incidents tracked similarly to Oregon, but Washington had greater proportions of households who embraced online shopping. But Oregon is also the least populous of the five states, which results in a smaller market for online platforms. Those in Florida were shopping online somewhere in between, but by Wave 4 had similar rates as Washington and Arizona (~47%).

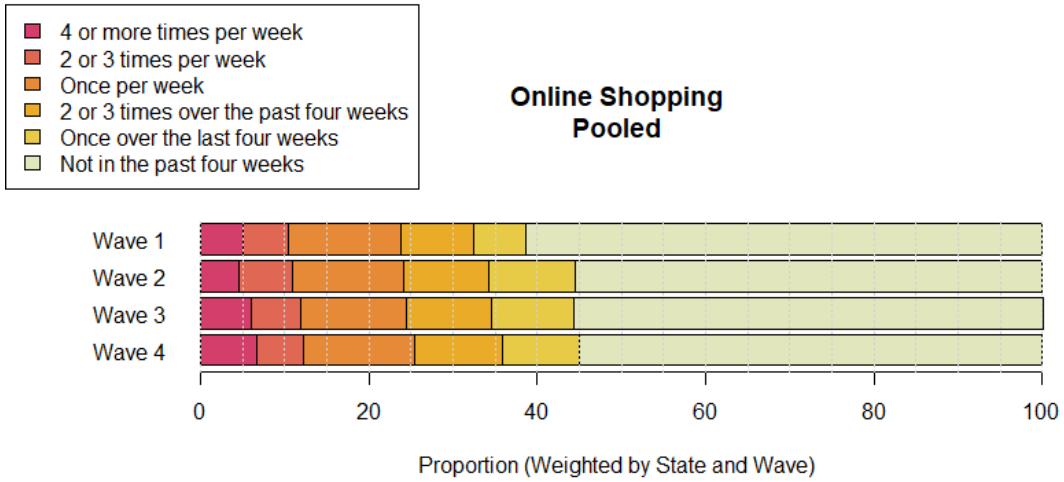


Figure 4.3 Online grocery shopping frequency across all survey waves (pooled)

Alt Text: This graph shows online grocery frequency across the four survey waves. Results from all five states are presented pooled. Frequency categories include: four or more times per week; two or three times per week; once per week; two or three times over the past four weeks; once over the last four weeks; and not in the past four weeks.

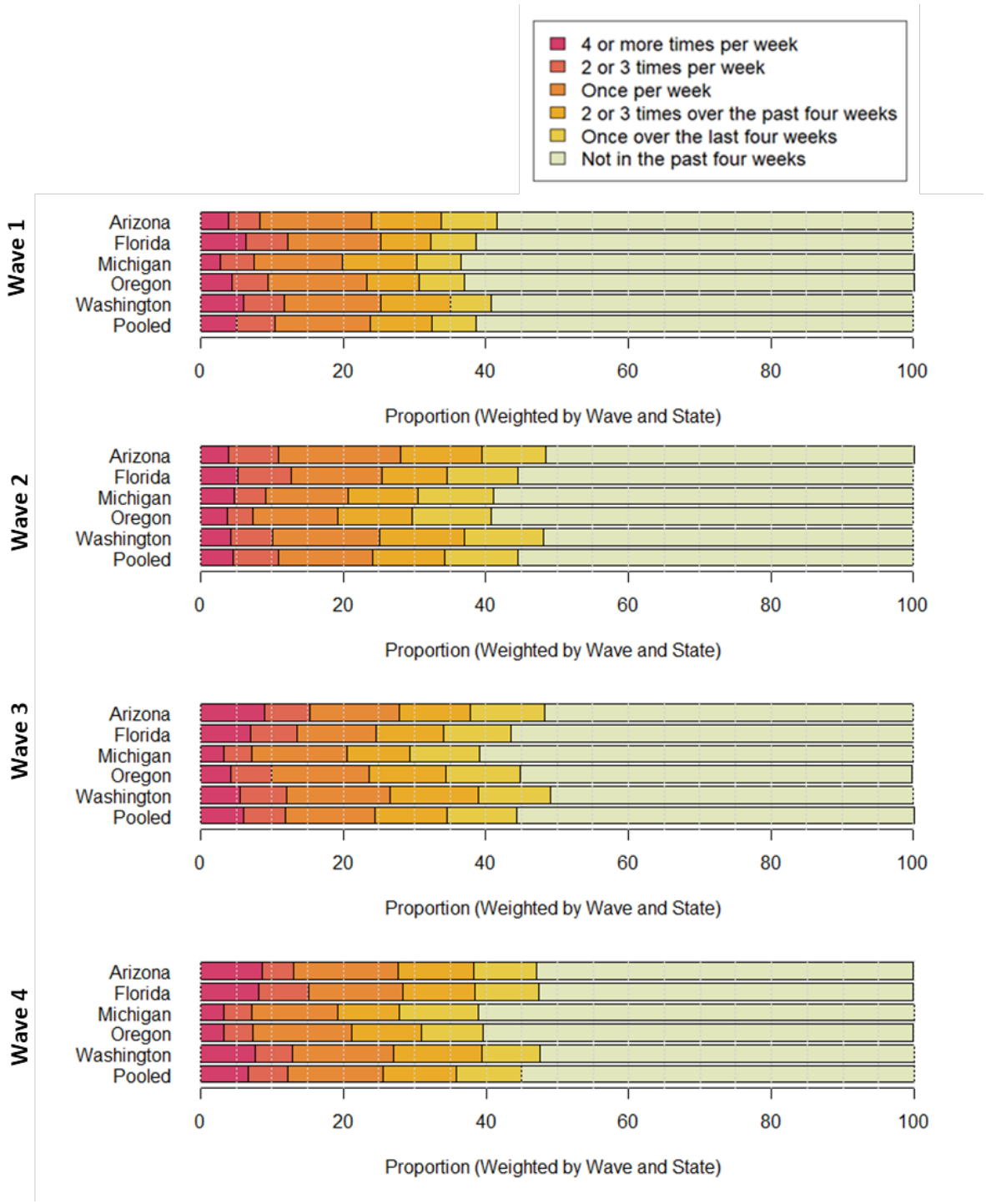


Figure 4.4 Online grocery shopping frequency by state

Alt Text: Four graphs show online grocery shopping frequency with results presented by wave and by state. Frequency categories include: four or more times per week; two or three times per week; once per week; two or three times over the past four weeks; once over the last four weeks; and not in the past four weeks. Data are weighted by wave and by state.

As with the mechanism of grocery shopping, the COVID-19 pandemic also brought changes in the mode of transport to shop for groceries. As shown in

Table 4.1 through **Table 4.5** below, households used a variety of modes to access their grocery shopping destinations. As with in-store grocery shopping frequency, households' use of all modes tended to increase over the course of the pandemic. Note that respondents to the survey could select all that apply, so the percentages do not sum to 100%. Also note that the percentages in each table are the proportions of all households in the sample using that mode at least once in the four weeks prior to the survey and not the proportions of trips made by that mode.

Similar to behaviors prior to the pandemic, the automobile was the most common mode to access grocery stores. This is not surprising given the burden of hauling goods, variations in grocery access, and the heterogeneity in store choice (Markenson et al., 2019). In general, automobile usage tended to increase over time with Wave 1 having the lowest percentages of car use of the four waves, as shown in **Table 4.1**. Arizona and Washington had peak automobile use during Wave 2. These two states also had the lowest percentages of households reporting using an automobile in Wave 4 (~90%). This may be because of increased ability to make use of alternatives to driving in the urban areas in the state.

During the pandemic, many transit agencies saw drastic declines in ridership due to fears of contracting COVID, the increase in people working from home, and cuts in service due to staffing shortages and revenue (He et al., 2022). The use of public transit generally increased over the pandemic, as shown in **Table 4.2**. Arizona and Washington saw the biggest increase from Wave 1 to Wave 4, with 187% and 143% increases, respectively.

The percentage of those households reporting using ridehail to access grocery stores generally increased over the pandemic, as shown in **Table 4.3**. This shift can also be due to the dramatic decline in ridehailing services in the beginning of the pandemic. The demand for these services fell as people were traveling less. Ridehailing companies, like Uber, shifted their focus from passenger travel to food delivery services (Goldstein, 2020), but then passenger travel increased again once vaccines were available.

Finally, walking and cycling to buy food were generally reported by a growing percentage of households over the four waves of the study, as shown in **Table 4.4** and **Table 4.5**. Many have reported on the increase in desire for physical activity during the pandemic, as many were working from home with fewer opportunities to engage in active transport or go to the gym (Webber et al., 2022). Cycling was particularly popular over the course of the pandemic (Büchel et al., 2022). The rates of use reported by households in each wave match seasonal trends, particularly for Michigan, Oregon and Washington, which were experiencing warm and dry weather during the Wave 3 survey.

Table 4.1 Percentage of households reported using a personal auto to access grocery stores during the past four weeks (weighted)

	AZ	FL	MI	OR	WA
Wave 1	84%	81%	78%	82%	82%
Wave 2	94%	92%	95%	92%	92%
Wave 3	91%	92%	93%	90%	90%
Wave 4	91%	92%	96%	94%	90%

Table 4.2 Percentage of households reported using transit to access grocery stores during the past four weeks (weighted)

	AZ	FL	MI	OR	WA
Wave 1	4%	4%	3%	7%	6%
Wave 2	5%	7%	4%	9%	8%
Wave 3	9%	8%	6%	11%	12%
Wave 4	11%	9%	4%	10%	13%

Table 4.3 Percentage of percentage of households reported using ridehail to access grocery stores during the past four weeks (weighted)

	AZ	FL	MI	OR	WA
Wave 1	4%	5%	3%	3%	3%
Wave 2	6%	7%	2%	4%	3%
Wave 3	10%	7%	4%	5%	7%
Wave 4	10%	8%	3%	3%	7%

Table 4.4 Percentage of households reported using a bicycle to access grocery stores during the past four weeks (weighted)

	AZ	FL	MI	OR	WA
Wave 1	3%	4%	3%	5%	4%
Wave 2	6%	8%	4%	6%	5%
Wave 3	9%	8%	7%	10%	9%
Wave 4	10%	10%	6%	8%	9%

Table 4.5 Percentage of households reported walking to access grocery stores during the past four weeks (weighted)

	AZ	FL	MI	OR	WA
Wave 1	8%	6%	4%	14%	10%
Wave 2	11%	11%	10%	18%	19%
Wave 3	11%	11%	10%	19%	20%
Wave 4	14%	12%	10%	15%	17%

In addition to the detailed questions about their grocery shopping activities in the previous four weeks, the survey also asked whether respondents had *ever* ordered groceries online for delivery and pick-up, shown in **Figure 4.5** and **Figure 4.6**. As expected, the percentages increased quite dramatically from Wave 2 to Wave 4 for all states for both pick-up and delivery. There are some distinct differences between them, however.

For online delivery, states tended to have a smaller range of percentages of households having tried this in Wave 2, from 34% (Oregon and Michigan) to 38% (Florida). But by Wave 4, there was greater dispersion in these percentages, ranging from 38% (Michigan) to 49% (Florida). Michigan households were slower to try ordering online groceries for delivery than other states, with only about a 4% increase between Wave 2 and Wave 4. In contrast, other states saw a more pronounced growth in households trying online grocery delivery over the same period (Arizona ~ 10%, Oregon ~8%, Florida ~10%, and Washington ~11%).

In contrast, states showed distinct differences in online ordering for pick-up at the grocery store at Wave 2 and Wave 4. Only 32% of Oregon households reported having tried ordering online for pick-up, compared to 41% of households in Arizona. By Wave

4, Oregon households reporting ordering groceries for pick-up increased by 6%, but it still lagged other states with Florida (42%), Michigan and Washington (44%), and Arizona (48%).

It is interesting to note the relative popularity of the two options at the state level. By Wave 4, Florida, Oregon, and Washington had a greater percentage of households who had tried grocery delivery (49%, 43%, and 47%, respectively) over pick-up (42%, 38%, and 44%, respectively). But Arizona and Michigan had a larger proportion of households trying grocery pick-up (48% and 44%, respectively) over delivery services (47% and 39%, respectively). The reasons for these differences are not obvious from our data, but could be rooted in the differences in options.

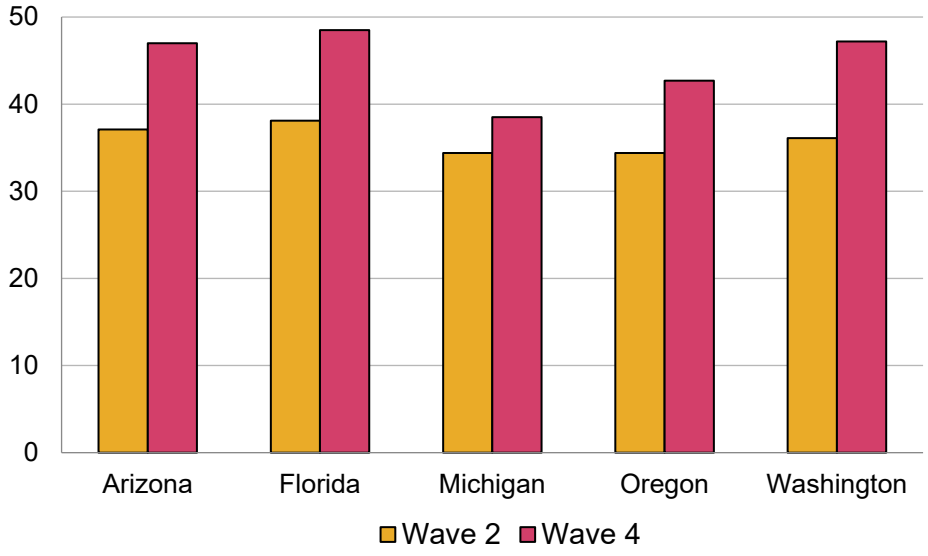


Figure 4.5 Proportion indicating use of online grocery *delivery* at some point

Alt Text: This graph shows the proportion of people indicating that they ordered groceries online for delivery at some point in the past. Results from Wave 2 and Wave 4 are presented by state to show the increase between the two waves.

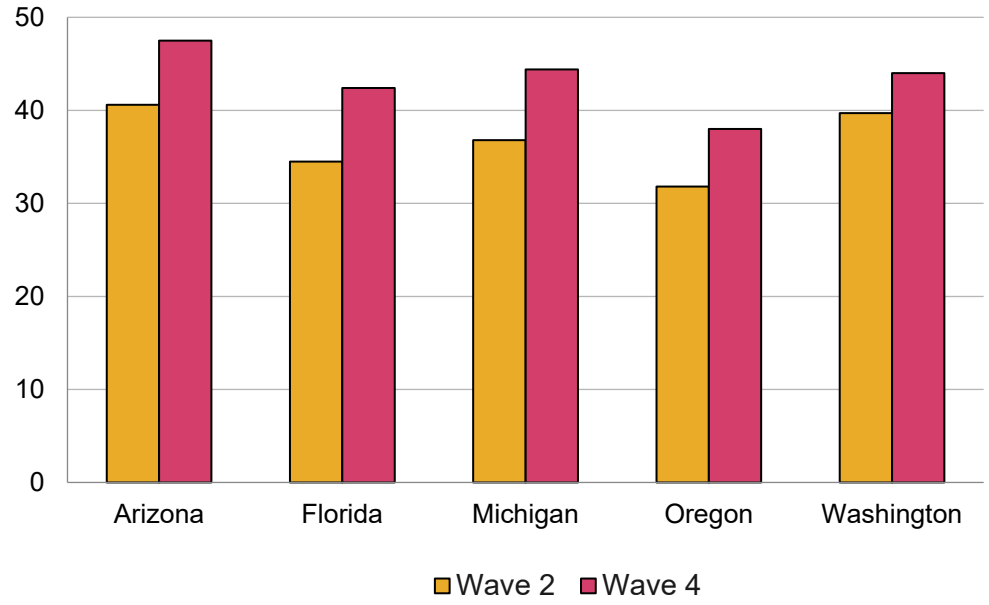


Figure 4.6 Proportion indicating use of online grocery *pick-up* at some point

Alt Text: This graph shows the proportion of people indicating that they ordered groceries online for pick up at some point in the past. Results from Wave 2 and Wave 4 are presented by state to show the increase between the two waves.

4.2 WHAT BARRIERS HAVE CERTAIN SUBGROUPS FACED IN ACCESSING ESSENTIAL GOODS?

The COVID-19 pandemic had differential impacts on households and exacerbated the economic divide. Everyone experienced the hardship of the pandemic, but households that were struggling prior to the pandemic tended to be more severely impacted. In this section, the various barriers to accessing food and household items that households experienced during the survey period are documented. These range from technology, mobility, housing, and banking resources.

Table 4.6 below shows the percentage of households in each state reporting various barriers to mobility, shopping, and e-commerce. Literature has documented how lack of access to a credit or debit card can limit commercial transactions, including buying items online (Trude et al., 2022). Similarly, lack of access to technology, including smartphones, computers, and broadband at home, have been documented as major barriers to modern daily life (Ellison-Barnes et al., 2021). The percentages of households that reported that they did not have access to credit and debit cards and various information and communication technologies were relatively low in all states at less than 5%. However, the technology limitation impacting the largest percentage of households in all of the states was lack of a data plan for their smartphones, which impacted between 7-9% of households.

Mobility barriers were much more pronounced. Around 9-12% of households in each of the states reported not having access to a vehicle. In most states, 5% of the households have no licensed drivers; Oregon is the exception with 7%. Most striking is the percentage of households reporting that someone living with them has a condition that limits their mobility. Between 24% and 29% indicated that a household member has a mobility limitation.

Various housing conditions can impact the ability to easily receive and securely store deliveries, limit storage capacity and, specific to COVID, more readily present risk of exposure to others, such as in elevators or other shared spaces. Significant percentages of households in each state reported having no secure place to leave deliveries, ranging from 18% in Arizona to 25% in Michigan. There was a lot of variation in the percentage of households indicating that delivery personnel need to request access to the building or site, from 12% in Oregon to 30% in Florida. This has the compounding impact of offering a more secure location to leave deliveries, but can pose a barrier if the recipient is not at home.

Respondents were also asked about the availability of online ordering from local food retailers. The weighted results from Wave 4 shown in **Table 4.7** indicate that the overwhelming majority of respondents have online ordering as an option and, thus, this is not the barrier to use. However, what is interesting about these results is that the lack of knowledge about whether local food outlets offer online ordering is a bigger barrier than not having the option. Both of these responses are relatively small, however. Future work might consider examining how these responses vary spatially.

Table 4.6 Proportions reporting barriers to either in-store or online grocery shopping (Wave 4)

	AZ	FL	MI	OR	WA
Financial Barriers					
Household does not have access to a credit/debit card	2%	3%	4%	1%	2%
Mobility Barriers					
Household does not have access to a vehicle	11%	12%	10%	9%	10%
Household has no licensed drivers	5%	5%	5%	7%	5%
Respondent or someone in respondent's household has a condition that limits their mobility	26%	27%	24%	29%	26%
Technological Barriers					
Household does not have access to a computer or tablet	5%	5%	4%	3%	2%
Household does not have access to the internet	4%	5%	4%	3%	2%
Household does not have access to a smartphone	4%	4%	4%	5%	5%
Household does not have access to a data plan	7%	8%	8%	9%	9%
Residential Barriers					
No protected place to leave deliveries	18%	21%	25%	21%	19%
Delivery personnel have to request access	26%	30%	14%	12%	22%

Table 4.7 Respondents' knowledge of local retailers' online grocery ordering options (Wave 4)

	AZ	FL	MI	OR	WA
Don't know	4%	5%	5%	6%	6%
No	2%	2%	2%	3%	2%
Yes	95%	93%	94%	91%	91%

4.3 TO WHAT EXTENT DO/CAN ONLINE PLATFORMS HELP?

Understanding that the COVID-19 crisis exacerbated the obstacles that many faced prior to the pandemic, online platforms offered many households some relief in terms of convenience, health and safety, and increased access to essential items. Although the pandemic provided the impetus for many to try online grocery ordering for pick-up and delivery, it remains underutilized relative to consumers' embrace of online purchasing for other goods (Aull et al., 2021). Thus, this section asks what the future holds for the use of these platforms and the "stickiness" of behaviors adopted during the pandemic.

Figure 4.7 below shows the (pooled) responses to the question, "Approximately what proportion of your household's grocery shopping do you anticipate being done by shopping in-store versus ordering online (for pick-up or delivery) at this time next year?" for Wave 2 and Wave 4. The first obvious thing to note is that there are no discernable differences between Wave 2 (January-March 2021) and Wave 4 (September-November 2021). So as the pandemic recovery period progressed, there were no increases in the anticipated amount of online grocery shopping households expect to do. However, around 60% of households indicated that online shopping would play *some* role in household provisioning (mostly in-store to all online) and just under 30% of households said that it would play a *major* role (50% or more of grocery shopping).

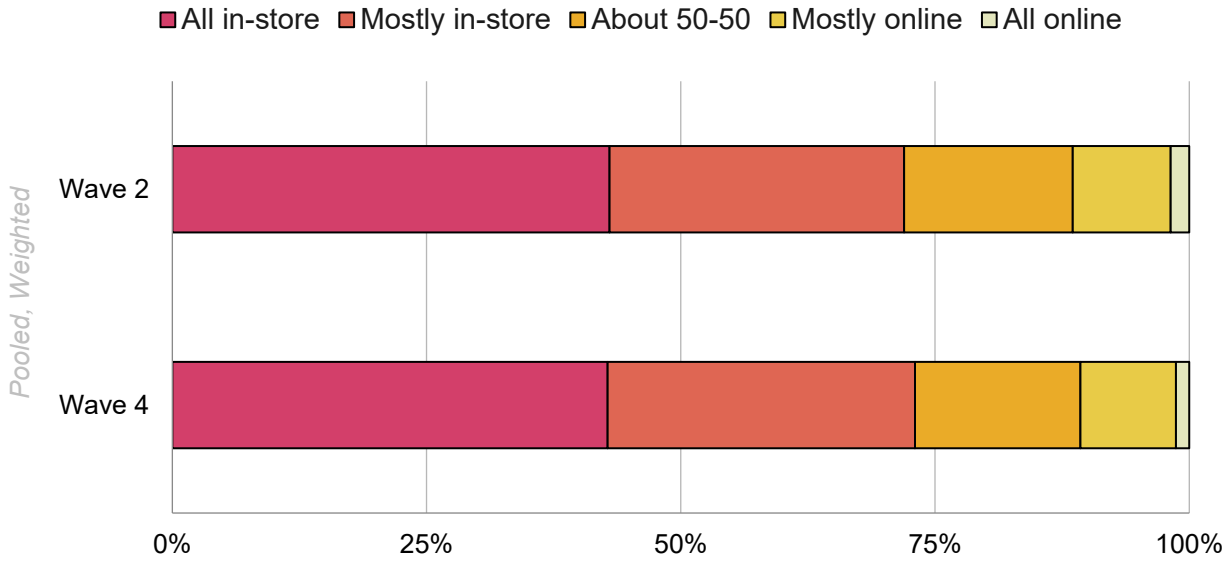


Figure 4.7 Projected grocery shopping mechanism (in-store vs. online) a year from the time of survey (Wave 2 and Wave 4)

Alt Text: This graph shows the projected use of in-store and online grocery shopping options a year from the time of the survey. Pooled results from Wave 2 and Wave 4 are presented. When asked to project how they intended to obtain groceries a year from the time of the survey, respondents could choose between five options: all in-store; mostly in-store; about 50-50; mostly online; or all online.

The differences between the states were mostly small, as shown in **Table 4.8.** However, a greater percentage of households in Arizona and Washington were likely to favor online shopping (14% each) compared to the other states.

Table 4.8 Grocery shopping mechanism (in-store vs. online) anticipated by respondents in a year from the time of the survey (Wave 4, weighted)

	All in-store	Mostly in-store	About 50-50	Mostly online	All online
Arizona	40%	30%	16%	12%	2%
Florida	44%	29%	18%	9%	1%
Michigan	45%	32%	16%	6%	1%
Oregon	43%	34%	14%	8%	2%
Washington	41%	31%	14%	12%	2%

To explore the reasoning behind these decisions, we asked households about the relative importance of a variety of factors when it comes to making decisions about how and where to shop for groceries. The pooled responses from the last wave of our survey, Wave 4, are shown below in **Figure 4.8**.

A majority of households rated the following as very important: being able to inspect items for quality, having a wide selection, getting the best price, and no delivery fees. This has mixed implications for shopping online, where getting a good price (or comparison shopping, which also scored highly) or having a wider selection may be advantages. But physical inspection of goods and delivery fees are clear disadvantages of online grocery for delivery. Picking up online orders avoids delivery fees and still offers a time savings over in-store shopping. Half of households ranked the ability to shop at any time as very important, which also has positive implications for the future of online grocery shopping.

Less important considerations included getting out of the house, redeeming coupons, minimizing effort and travel, and not having to carry items. The latter is likely due to the overwhelming popularity of driving to the grocery store, as discussed earlier. As with much of the information presented in this report, a more detailed examination of how these responses vary by demographic group or location is an obvious and important next step.

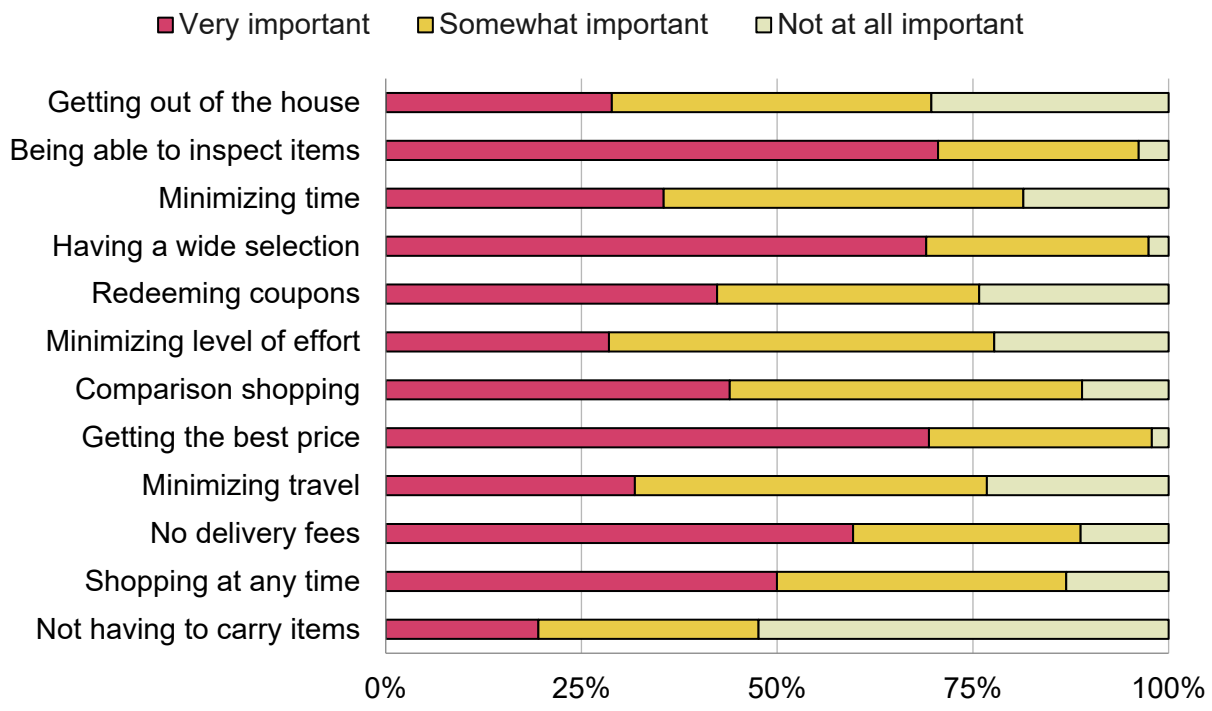


Figure 4.8 Factors influencing the decision about how and where to shop for groceries (Wave 4)

Alt Text: This graph shows the factors influencing the decision about how and where to shop for groceries. Pooled results from Wave 4 are presented. Respondents were asked to rate 12 factors on a scale of importance from very important to not at all important. The 12 factors they were asked to consider include: 1) wanting to get out of the house; 2) being able to inspect items for quality; 3) minimizing time spent shopping; 4) having a wide selection of items to choose from; 5) being able to easily redeem coupons; 6) minimizing level of effort; 7) being able to easily comparison shop; 8) getting the best price available; 9) minimizing travel; 10) avoiding delivery fees; 11) being able to shop at any time; and 12) not having to carry items.

Many tried online grocery shopping for the first time during the pandemic. Those initial experiences can be crucial in informing future behaviors and the stickiness of technology adoption. **Figure 4.9** below shows the proportion of households (who have ordered groceries online) in each state indicating they were satisfied or very satisfied with various aspects of online grocery ordering during Wave 4. Across all states, households who ordered online were generally satisfied with most aspects of the process. Two related aspects of online shopping—item availability and item substitutions (which occur when an item ordered online is out of stock or not available)—received the lowest levels of satisfaction across households from all states.

There were some variations in responses between the states, with a larger proportion of online shoppers in Florida and Washington being satisfied with the process. Without more information about the online services there, it is hard to know the reasons for

these differences. However, nearly 50% of households in those two states reported having done some online shopping in the last four weeks during Wave 4. So, these positive outcomes appear to be linked to higher rates of usage.

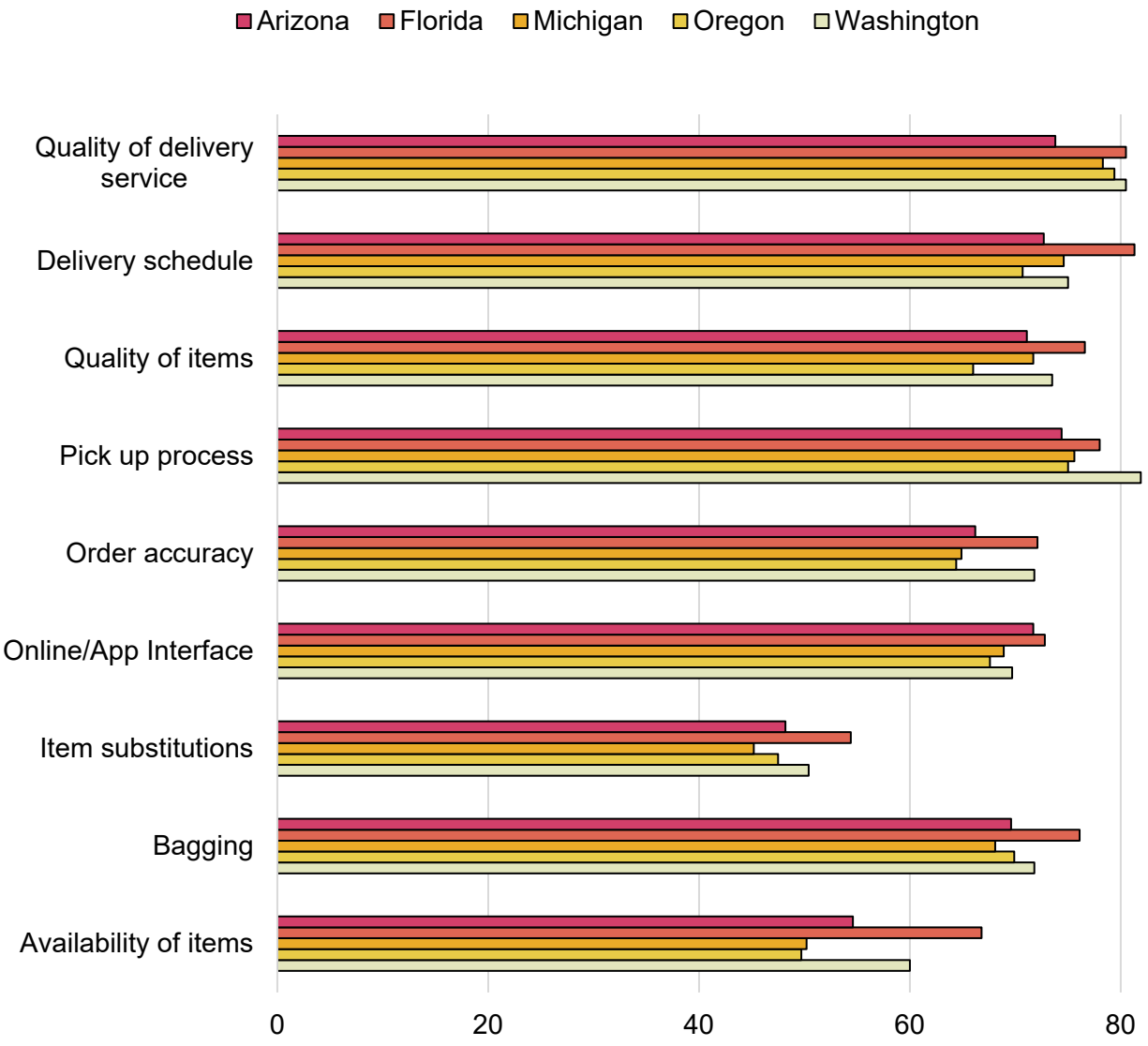


Figure 4.9 Percentage of households indicating they are "satisfied" or "very satisfied" by their experiences with online grocery ordering (Wave 4).

Alt Text: This graph shows the percentage of household indicating that they are "satisfied" or "very satisfied" by their experiences with online grocery ordering. State-level results from Wave 4 are presented. Respondents were asked to rate their satisfaction level with nine aspects of online grocery ordering: 1) quality of delivery service; 2) delivery schedule; 3) quality of items; 4) pick-up process; 5) order accuracy; 6) online/app interface; 7) item substitutions; 8) bagging of items; and 9) availability of items.

5.0 FOCUS GROUPS

A qualitative approach was undertaken to add more personal context about how, but also why, older adults were utilizing e-commerce shopping and delivery platforms during the pandemic and the role of mentoring in facilitating e-commerce adoption. To develop a more nuanced understanding of household provisioning behavior, preferences, and experiences with e-grocery shopping, our research team conducted a series of focus groups in August and September 2021. We opted to focus on two core groups: 1) older adults who had experience ordering groceries online and 2) people who had helped friends and/or family members order online during the pandemic (referred to henceforth as “mentors”). We were curious to explore how older adults—a cohort that typically has lower rates of technology adoption than younger adults (Faverio, 2022)—develop awareness of e-grocery shopping options and their pathways to technology adoption. To this end, we were also curious to explore the role that mentors, such as friends and/or family members, play in helping older adults develop confidence utilizing technology and online ordering.

5.1 FOCUS GROUP DESIGN AND ANALYSIS

Our sampling frame was limited to people living in the Portland metropolitan area. Three organizations provided recruitment support, including AARP Oregon, the Asian Pacific American Network of Oregon (APANO), and Community Partners for Affordable Housing (CPAH). We asked contacts at these organizations to share a flier with information about the focus groups with their members. Interested participants were asked to register their interest via an online form. Our recruitment materials noted that participants would receive a $50 VISA gift card for their participation.

AARP Oregon assisted us with recruiting older adults who had personal experience with e-grocery shopping. CPAH connected us with the resident services coordinator for one of their income-restricted housing developments for adults 55+ who helped us recruit participants living at the development. Through APANO, we recruited participants we identified as mentors. We also shared the recruitment flier with student groups at Portland State University (PSU) and Portland Community College (PCC) to help us reach additional participants for our “mentor” focus groups. In addition to asking interested mentor participants to confirm that they had assisted a friend/family member order groceries online, we also asked mentors to identify whether they spoke a language other than English at home.

We organized a total of five focus groups: two were focused on older adults with experience ordering groceries online; one was focused on older adults living in income-restricted housing who may or may not have ordered groceries online; and two were focused on mentor groups. The composition of the five focus groups is noted in **Table 5.1**.

Table 5.1 Focus group participants' demographics

	Age	Race/Ethnicity	Gender Identity	Language(s) Spoken at Home	Owns/Leases a Car
Group 1: Older Adults in Income-Restricted Housing					
Participant 1	55+	White or European American	Woman	English	Yes
Participant 2	55+	White or European American	Man	English	Yes
Participant 3	55+	White or European American	Woman	English	Yes
Participant 4	55+	White or European American, American Indian or Alaska Native	Man	English	Yes
Participant 5	55+	White or European American	Man	English	Yes
Participant 6	55+	White or European American	Woman	English	No
Group 2: Older Adults					
Participant 1	65-74	White or European American	Woman	English	Yes
Participant 2	65-74	Black or African American	Man	English	No
Participant 3	65-74	Hispanic or LatinX	Woman	Spanish	Yes
Group 3: Older Adults					
Participant 1	75-84	White or European American	Woman	English	Yes
Participant 2	75-84	Hispanic or LatinX	Man	English, Spanish, Portuguese	Yes
Group 4: Mentors					
Participant 1	35-44	Black or African American	Woman	English	Yes
Participant 2	35-44	Black or African American	Woman	English	Yes
Participant 3	35-44	White or European American	Man	English	Yes
Participant 4	35-44	Black or African American	Woman	English	No
Group 5: Mentors					
Participant 1	25-34	Hispanic or LatinX	Man	Spanish	Yes
Participant 2	45-54	Black or African American	Woman	English	Yes
Participant 3	25-34	Black or African American	Woman	English	Yes
Participant 4	35-44	Asian or Asian American	Woman	English, Vietnamese	Yes
Participant 5	18-24	Asian or Asian American	Woman	Vietnamese	No
Participant 6	45-54	Asian or Asian American	Woman	Vietnamese, English	Yes

The focus group with residents living at an income-restricted development for adults 55+ was conducted in person in a courtyard at the residence. We set up two video cameras to record the discussion. The session was then manually transcribed from the video with the notes used to fill in gaps if/when the audio was difficult to discern due to ambient street noise. The other four focus groups were conducted online via Zoom with automatic transcription enabled.

Each focus group lasted approximately 90 minutes. To begin with, participants were asked to take an abbreviated version of our survey, which was followed by a facilitated discussion. In the focus groups with older adults, topics discussed included comfort with information technologies; online shopping experiences and whether participants had ever received help from others; opinions about online grocery shopping; what factors make shopping for groceries difficult/easy whether online or in-store; and projected use of online grocery shopping in the future. Topics covered in the mentor focus groups included the mentors' experiences helping their mentees shop for groceries and other items online; how they would rate their mentees on their technological acumen; whether they felt that their mentees would be able to use online ordering platforms on their own; and their projected use of online grocery shopping in the future. (Focus group interview guides are in **Appendix 8.4**.)

After the focus groups were complete, the research team cleaned the interview transcripts and removed all personally identifiable and sensitive information. Next, we qualitatively coded each transcript to explore the general themes related to participants' digital acumen; household provisioning behavior and preferences; experiences with e-grocery services; the role of mentoring; and perspectives on post-pandemic household provisioning. For additional comparison and to cross-check the validity of the qualitative coding process, public health graduate students at Portland State University enrolled in a Qualitative Research Methods class in the fall of 2021 were assigned to qualitatively code our transcripts as a class assignment.

5.2 FOCUS GROUP FINDINGS[4]

5.2.1 Grocery Shopping Preferences

While all focus group participants had used e-commerce and e-grocery services to some extent prior to our interviews, experiences between focus groups and between participants within the same groups varied substantially. Most participants held favorable views of shopping online for products such as appliances, clothing, and gifts, indicating a high level of comfort and ability to use well-known e-commerce services. As for e-grocery shopping, feedback and experiences were mixed. Although most participants had used e-grocery services in the past, many continued to prefer to shop

[4] This is section is taken from Max Nonnamaker's paper "Leave It by the Door: Household Shopping Preferences During the Pandemic Era and Balancing E-Grocery and In-store Trade-offs" (Nonnamaker, 2022).

for food at grocery stores due to the desire to see and select the items they intend to purchase and assess quality before selection. The desire for in-store selection applied primarily to perishable goods, mainly produce, fruit, and meat. Even for participants who indicated frequent or regular use of e-grocery services, many indicated a preference for ordering only non-perishable goods, expressing the same desire to select produce, fruit, and meat in person at the store. Older adult participants also indicated a preference for shopping in-store to read nutrition labels and that walking through the store supplied the opportunity for physical activity.

While the desire to select perishable goods in person acted as a facilitator for in-store grocery shopping, the distrust of online grocery shoppers acted as a prominent barrier to use of e-grocery services. One component responsible for feelings of distrust of online shopper selection contributed to participants feeling that online shoppers lacked the experience needed to make an informed selection of products. One participant in the low-income older adults focus group stated that one of their grandchildren works as an online shopper, and that they do not want someone like their grandchild to shop for them, stating, “They don’t know yet, they haven’t cooked enough.” Another participant in one of the mentor focus groups shared similar sentiments about online shoppers based on previous experiences using e-grocery services, stating, “I have bad luck with online shoppers. You can tell the produce was picked by a 12-year-old because it’s just horrible or almost expired.” The distrust of online shopper selection also extended beyond quality of foods to items that did not meet the specifications of participants’ orders, mainly regarding substitutions. Participants shared their concerns with online shoppers making substitutions for items that were unavailable or not meeting their preferences for quantity or brand, feeling that online shoppers made these substitutions without permission or regard to the intended use of the product. These substitution issues were more pronounced in older adult focus groups.

Older adult participants’ feelings of distrust for online shoppers also included an issue in autonomy of decision-making. While many participants in each group discussed wanting to select their groceries in person to assess quality, older adult participants placed a greater emphasis on not wanting others to make decisions for them. One participant in an AARP-affiliated older adult focus group who spoke about their preference to personally select their groceries often stated that, “If I’m satisfied, I’m walking away with it. And I can’t trust nobody else to make those decisions for me.” Another participant in the low-income older adults focus group shared this concern with others making decisions for them, stating, “I want to look at it myself and want to have it right in front of me.” A participant from the same focus group also stated, “If I need something bad enough, I’ll go to the store myself.” Participant concern with the autonomy in the grocery selection decision-making process also appeared to be more prominent with men.

Other factors that seemed to drive the preference to shop in-store for groceries were the ability to use coupons, seek deals, and practice more spontaneity with grocery selection. Within these preferences was the desire to cut costs associated with e-grocery fees and delivery costs. One participant in the low-income, older adults focus group stated that they go to the store to search for, “flaming deals,” with what is on sale

and that e-grocery services do not provide the same experience. Multiple participants across all focus groups referred to themselves as “couponers” or bargain shoppers, using specials, deals, and low prices as a primary grocery selection driver. Seeking deals in grocery stores was also paired with a degree of spontaneity with grocery selection decision-making, using specials as the basis of grocery selection. While this appeared across all focus groups, shopping for deals appeared more prominent in older adult focus groups and in the mentor focus group in which participants spoke a language other than English at home. Additionally, participants across all groups noted how e-grocery services tend to be more expensive due to fees, delivery charges, difficulty identifying sales, and use of food benefits like SNAP.

Within each focus group, there tended to be one high-frequency user of e-grocery services who prioritized perceived convenience above all other provisioning preferences. These participants tended to be women who had been using e-grocery services prior to the COVID-19 pandemic, but increased their frequency of use after the onset of the pandemic. One participant from the low-income, older adults focus group offered continual tips and suggestions for other participants experiencing difficulties using e-grocery and e-commerce services, and during a conversation about online shoppers making substitutions stated, “If it’s close, I’m good – Just bring it.” A common preference also held by these high e-grocery service users was the desire to avoid traveling to and shopping in grocery stores both before and after the pandemic.

5.2.2 Digital Acumen and Barriers to Adoption

All focus group participants indicated having some degree of access to the internet and communication technologies; however, the degree of comfort using technology and the ability to navigate digital spaces differed between participants. Within the older adults focus groups, more participants expressed experiencing difficulties using technology, with some having negative experiences associated with use leading to high degrees of digital distrust and little desire to use online e-commerce and e-grocery services. However, many older adults spoke to the benefit of using technology for communication and entertainment, with video call services and social media being preferred technology uses. One participant in the low-income older adults focus group reported having been scammed or misled while making purchases online on multiple different occasions, stating that they had been “burnt bad” and “ripped off.” The possibility of being misled online acted as a deterrent for making online purchases for many older adult participants, leading many to express skepticism when shopping online and the need to research products and sellers before making purchases. Multiple participants mentioned creating separate banking accounts for online use to avoid potential scams. Many also expressed frustration with the lack of availability of information about online services and the limited consistency between user interfaces of different services, websites, and smartphone applications. Despite these complications, most of the older adult participants gave themselves high ratings when asked to rate themselves on a scale from 1 to 10 on how comfortable they feel with using technology, with 10 being a high level of comfort and competency with use. Most of the older adult participants also indicated being primarily self-taught on internet use.

Access to stable internet connection was also an issue for low-income older adults. These participants all lived in income-restricted housing units and reported that the internet connection in their facility was poor and that with many residents connecting to the same service, they had concerns about security and privacy as well. Poor internet access was also a factor mentioned in mentor focus groups as a barrier to technology use for mentees. One participant in a mentor focus group mentioned that their father lives in older adult housing and experiences poor internet connectivity. Multiple participants in older adult focus groups also reported little desire to use technology or the desire to use it only when needed.

For mentor focus groups discussing the digital acumen of their mentees, the narrative was very different. For the same interview question about ranking comfort and competency of internet use, participants ranked their mentees lower than older adult participants ranked themselves and indicated that their mentees needed high levels of assistance to navigate digital spaces and experienced high levels of frustration and disinterest when attempting to access the internet. Mentor focus group participants indicated that mentees had limited exposure to technology in their early education and professional experiences, making learning difficult as adults. Participants also discussed how their mentees needed assistance accessing foodstuffs due to aging, poor health, and COVID-19 infection risk if shopping in-store. Additional barriers to use of online services, especially regarding e-commerce and e-grocery services, were highlighted by the mentor participants who speak languages other than English at home. Participants noted that for mentees who speak languages other than English or Spanish, navigating online spaces is a challenge due to the limited availability of services in other languages. One participant also discussed how their mentees who speak a language other than English are unaware of the different services that exist due to the limited availability of information in their preferred language. This participant also mentioned that their mentees receive supplemental nutrition assistance program (SNAP) benefits and are unaware of how to use these benefits for online services.

Across all focus groups, participants spoke to the benefit of using e-commerce and e-grocery services for comparison shopping. Participants indicated that e-grocery service applications can be beneficial for comparing prices, looking for discounts, and making virtual grocery lists. For older adults using these services, the prominent preference was to make comparisons online and make purchases at the store, while mentor participants indicated a preference for helping mentees to compare products and prices online and order online to avoid trips to grocery stores.

5.2.3 Mentors as Facilitators and Barriers

While mentor focus group participants discussed coaching family, friends, and community members to use e-grocery services independently, mentors seemed to fall into the role of personal shoppers. Some participants mentioned that prior to the COVID-19 pandemic, they had already been doing much of the grocery shopping for their mentees and that e-grocery services provided an opportunity to make this responsibility more convenient. Additionally, mentors showed signs of burnout with

coaching mentees on how to use e-grocery services, indicating that it is quicker and easier to order groceries for them. When asked about if their mentees would be able to use e-grocery services on their own, one participant stated, “I think that they could do it if they tried, but I think it would take them a very long time to do something that would take me a few minutes to do, so I generally help them with that.” Experiencing burnout was complemented by mentee disinterest and difficulty adopting e-grocery services. For the same question regarding independent use of e-grocery services by mentees, one participant from the mentor focus group who speaks a language other than English at home stated, “I've tried. I'll be by their side, guiding them, so that they can learn along the way. I’ll also write down steps so they can follow. I don't blame them it's very difficult, seeing all that laid out. Yeah, I don't think it's possible.” Falling into the role of personal shopper for mentors was also reflected in the responses of older adult participants who stated having access to someone who uses e-grocery services or has a high digital acumen. One participant in an older adult focus group mentioned having a spouse that is very comfortable using internet technology and that when they are unable to perform a task online, they get upset and ask their spouse to do it.

5.2.4 COVID-Era Shopping, Post-COVID Expectations and Balancing Trade-Offs

Most participants across all focus groups considered their experiences with e-grocery services to be largely driven by the COVID-19 pandemic, except for participants who indicated using these services prior to the pandemic, and participants’ thoughts on post-pandemic shopping were mixed. Older adult focus group participants indicated using e-grocery services during the initial pandemic periods to avoid crowded grocery stores and risk of COVID-19 transmission, which is also when many mentors indicated having started to assist their mentees with e-grocery services. For older adults, as the pandemic period progressed, many indicated feeling more comfortable shopping in-store, especially once vaccinations became available. One participant in an AARP-affiliated older adult focus group stated, “Because I’ve been vaccinated, I have a little more confidence going to the grocery store myself, with a mask on. I don't feel that I really need to be as cautious as I was before. I’m still cautious, but I feel like I cannot be so reliant on the computer now.” While some older adults viewed e-grocery services as convenient and a means to avoid the risk of contracting COVID-19, they appeared to be willing to trade these benefits for in-store shopping preferences. For mentor participants, convenience and minimizing COVID-19 risk for mentees seemed to take precedence over in-store shopping preferences, in part because of the additional responsibility taken on to assist mentees with accessing foodstuffs.

For older adult participants, the social aspects of shopping also seemed to be a driver of in-person shopping during the pandemic. Many older adult participants indicated that they enjoy shopping at the grocery store, and that they have additional time to dedicate towards shopping and product selection due to being retired. One participant from the low-income older adult focus group mentioned both enjoying and needing the sense of

community that comes with shopping for things in person. Another older adult participant stated:

> “When you're retired you can have a lot more time to [grocery shop], you have the luxury of not having to use the internet, but of actually going to the place where you want to buy stuff so you can examine it yourself and decide if it's what you want. So, even though it's easier and faster to order online, it's not my preference and it's probably just for personal reasons.”

Expectations for shopping in the post-COVID world differed between participants and introduced different trade-offs for participants. The most prominent thought between participants was that shopping for food and household items will primarily return to in-person shopping at grocery stores. However, mentor focus group participants expressed that e-grocery services will continue to be an option or something to be used situationally. For those who have adopted shopping for groceries primarily through e-grocery services, ordering groceries online may continue to be their main source of foodstuffs. One participant in a mentor focus group who works as an online shopper stated, “I definitely see the same people shopping. It's not like I see a lot of people that jump on to do it once or new people that have never been on the service, I see the same people. I shop for the same people all the time.” Another mentor participant from the group that speaks a language other than English at home indicated hoping that grocery delivery continues after the pandemic, but is made more accessible and affordable, stating, “I’m hoping that they see that it's not because of this pandemic, but that there are people who are not able to leave their homes to get groceries and that delivery shouldn't be [an extra charge].” For older adults, shopping in-stores continues to be the preference but is limited by their ability to do so. Participants in older adults focus groups indicated that changes to their health or crises in their lives may sway their grocery shopping behavior towards use of e-grocery services. As one participant in the low-income older adults focus group stated, “It depends on the state of my health. If I’m in charge of it, I’ll still be doing what I’m doing but if I need somebody to take care of me, it’s no longer my problem.”

The results from our five focus group interviews explore the multifaceted drivers of household provisioning preferences and the impact that COVID-19 had on how participants access food. While our number of participants was low and results are unlikely to be successfully generalized to larger populations, the themes identified through our qualitative analysis act as a starting point for further analysis on how the COVID-19 pandemic influenced household access to foodstuffs and provisioning behavior and construction of conceptual models to further understand provisioning behavior. Our results indicate that despite the convenience of e-grocery services and the opportunity to avoid in-store shopping it provides, the desire to leave one’s home and personally select groceries is a prominent driver of household provisioning behavior, and a potential element that separates it from the success of e-commerce services. Additionally, negative online experiences and digital distrust dissuade entry to e-grocery services, especially when considering the immediacy of food provisioning. For older adults, navigating new virtual spaces, the unavailability of information, delivery

fees, and limited inclusion of services in languages aside from English appear to be substantial barriers to use of e-grocery services. While mentoring was expected to provide greater access to independent use of e-grocery shopping services for older adults, our results seem to suggest that, in some ways, mentors can actually be a barrier, both due to reliance on the mentor to complete the e-grocery process and mentors finding it more convenient to shop for, rather than teach, their mentees.

While continuation of e-grocery shopping seems likely for those who have fully embraced it, our results suggest that use of e-grocery services in the post-pandemic world may be more situational or provide an additional provisioning option to help households access food. However, as we transition away from the COVID era, it is important to consider how accessible e-grocery services are and make this service more affordable and inclusive, allowing for greater access to foodstuffs for all households, with or without the presence of disaster.

6.0 DISCUSSION

This research led to the collection of information about grocery shopping behaviors during important phases of the pandemic, including: the initial economic reopening in 2020; the loosening and tightening of restrictions through fall and winter of 2020; the emergence of the vaccine in January 2021; and the surge of cases associated with the Delta variant in summer and fall of 2021. The four waves of surveys in five states produced a unique and rich dataset documenting the grocery shopping behaviors, preferences, and attitudes of consumers, and as well as some of the barriers that limit their ability to shop either online or in-store. These data were augmented with information about COVID-19 policies and health outcomes at the state, county, or zip code level depending on data availability and granularity. This report provides high-level descriptive statistics that compare results by state or by wave, or both. These survey data were complemented with qualitative work with older adults and mentors to understand more about the arc of adoption of online grocery shopping among those with greater vulnerabilities.

The initial descriptive analysis finds that, overwhelmingly, people continue to shop in-store and to access those stores by driving. Yet, during the pandemic many households experimented with online shopping and delivery platforms, and reported a high level of satisfaction with the process and results. Even as people returned to stores, online shopping did not drop off and instead showed a gradual increase over the four waves of the survey. Further, people predict that they will continue to use online shopping at the same or higher rate in the future. But online shopping has some obstacles to overcome if it is to become an integral mechanism for acquiring food, as evidenced by the survey and focus group findings. Many prefer to inspect items for quality and do not want to pay delivery fees. Older adults in our focus groups suggested a willingness to purchase non-perishable goods online, but that they continue to want to pick out their own perishable items in person, whether out of habit or out of a lack of trust in online shoppers.

At the time of writing this report, COVID-19 remains a part of daily life and cases continue to wax and wane as different variants take hold. However, the severity of those cases—as measured by hospitalizations and deaths—have been mitigated by vaccinations and mutations of the virus. Grocery shopping was an essential activity that did not stop during the pandemic. While many activities have resumed to pre-COVID levels, there are many aspects of daily life, including grocery shopping, that are forever changed. The availability of online options, the public’s knowledge of these options, and the degree of experimentation with them suggest that they will remain a part of household provisioning strategies. However, the results here suggest that they will likely be less favored than in-store shopping.

The complementarity of online and in-store shopping has implications for transportation planning. Most people plan on doing at least some in-store shopping in the future, but some households also plan to make use of online ordering for some household goods. The popularity of ordering online but picking up in-store indicates that people value the time savings but do not want to pay delivery fees. Should this increase in the future, the amount of parking needed at these stores may be reduced, as there may be shorter dwell times and higher turnover.

On-demand delivery platforms, like all segments of “gig work,” must grapple with a tenuous labor market and business model, so it is not clear how the supply of these services and the fees charged to consumers might change in the future. But deliveries of all sorts are on the rise, placing demands on the curb and calls for more regulation. Grocery shopping appears to play a small role in deliveries compared to those from restaurants and online goods, but our research findings indicate that it is growing. The perishable nature of groceries mean that these deliveries are time sensitive and may require special accommodations (i.e., refrigeration) to scale to greater numbers. Not having a secure, refrigerated place to store deliveries may limit the ability for some people—particularly those who work outside the home and/or do not have flexibility in scheduling—to take advantage of some of the benefits that online grocery ordering affords.

While some barriers to online grocery shopping persist, it is clear that it can—and does—fill important gaps and needs for people. It is a valued option in situations where people have mobility limitations, are quarantining or are sick with COVID, facing time pressures, or stores are not easily accessible. Many older adults may embrace online ordering in the future—due to illness or mobility restrictions. Future generations will be more aware of online ordering and have more digital acumen and, thus, may more readily switch to e-commerce to buy food.

In our effort to explore the arc of adoption of e-commerce technologies, we focused on older adults because they are more likely to experience mobility barriers, COVID vulnerabilities, and lack of digital resources or knowledge. Understanding the pathways to adopting new technologies is important in promoting resiliency and self-sufficiency. But the lessons learned could apply to a broader population. The role that mentors play in increasing awareness, disseminating knowledge, teaching skills, and providing support is critical as the pandemic simply brought the digital divide into sharper focus. Those with more advanced technological skills and digital acumen are better able to access a wide variety of resources, of which online grocery shopping is just one. Mentors can help vulnerable populations—including those who face language barriers—gain the skills needed to confidently navigate e-commerce technologies, encouraging resiliency and self-sufficiency in the process.

This study has several limitations that must be acknowledged. This survey was done online, which is a biased mechanism for understanding online shopping behaviors. The panel was pre-recruited and their incentives to participate were not disclosed by Qualtrics. Further, it was impossible to calculate a response rate, given the lack of

information about the sampling frame and the numbers contacted. Thus, it is difficult, if not impossible, to understand the bias in the sample.

The survey was conducted in only five states, rather than using a national sample. This was done to have a sufficient sample to potentially analyze the role of public policy, local differences in access to grocery stores, and the availability of online platforms across these states. The state-level sample was weighted and expanded to represent the state population based upon a limited number of household characteristics (income, household size, and presence of children). However, care should be taken when drawing conclusions from these state-level behaviors and extending them to the entire U.S.

Given the volume of data collected, there is much more to be explored. This report only shows high-level descriptive statistics. There is more work to be done exploring the behaviors of specific populations or geographic segments and making associations between COVID-19 incidence rates, public health policies, and individual characteristics, attitudes, and preferences. As noted earlier, the greatest outcome of this research is making these data public so other researchers and students can examine these aspects.

7.0 REFERENCES

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8.0 APPENDICES

8.1 DATA, SURVEY INSTRUMENTS, AND DATA DICTIONARY

The four waves of data from the five states and associated documentation (survey instruments and the data dictionary can be found archived on PDX Scholar:

> Clifton K; Howell A; Currans K; Abou-Zeid G; Nonnamaker M; and Lewis R. 2022.Data from: "Consumer Responses to Household Provisioning During COVID-19 Crisis (NSF RAPID 2030205)" and "Recovery and Accessing Opportunities for Household Provisioning Post-COVID-19 (NITC-RR-1435)" Portland, OR: Transportation Research and Education Center (TREC), 2022. https://doi.org/10.15760/TREC_datasets.19

8.2 SURVEY RESPONDENTS

Qualtrics panel surveys aggregate online panel resources through a dynamic dashboard to eligible and qualifying survey participants through different technologies (e.g., apps, browsers, and the lesser used email notifications), which inhibits an estimate of a true response rate based on conventional estimates of attempts to contact. Instead, the response rate is based on the proportion of surveys that are completed after potential respondents begin engaging with the survey (when they click on the link, survey, option). In other words, the estimated response rate is the number of completed surveys as a proportion of the number of completed surveys *and* any potential respondent that decides not to take or complete the surveys once engaging with the survey. This estimate is provided in Table 8.1 below.

Table 8.1 Sample size by wave by state

		Sample Size (N)					
Wave	**Dates**	**AZ**	**FL**	**MI**	**OR**	**WA**	**Total**
1	Sep. - Oct. 2020	1,083	1,000	842	1,079	758	4,762
2	Jan. - Mar. 2021	752	762	755	775	754	3,799
3	Jun. - Sep. 2021	741	744	752	750	747	3,778
4	Sep. - Nov. 2021	729	740	749	751	746	3,761

Table 8.2 Gender of respondent (unweighted)

	Arizona	Florida	Michigan	Oregon	Washington
Wave 1					
Female	67%	64%	71%	69%	66%
Male	32%	36%	28%	29%	32%
Other	2%	1%	1%	2%	3%
Wave 2					
Female	65%	64%	69%	67%	68%
Male	33%	35%	31%	31%	30%
Other	2%	1%	1%	2%	2%
Wave 3					
Female	61%	59%	63%	65%	62%
Male	38%	41%	35%	30%	35%
Other	1%	1%	2%	5%	3%
Wave 4					
Female	59%	45%	66%	64%	63%
Male	40%	55%	33%	34%	35%
Other	1%	0%	2%	2%	2%

Table 8.3 Race/ethnicity of respondent (unweighted)[5]

Wave 1	Arizona	Florida	Michigan	Oregon	Washington
American Indian or Alaska Native	4%	1%	2%	3%	5%
Asian or Asian American	4%	3%	4%	5%	12%
Black or African American	8%	17%	18%	3%	7%
Hispanic or LatinX	15%	12%	3%	6%	8%
Native Hawaiian or Pacific Islander	1%	0%	0%	1%	1%
White	75%	71%	75%	86%	76%
Other race/ethnicity	1%	0%	1%	0%	0%
Preferred not to disclose race/ethnicity	1%	1%	1%	1%	1%
Wave 2	**Arizona**	**Florida**	**Michigan**	**Oregon**	**Washington**
American Indian or Alaska Native	3%	2%	2%	5%	4%
Asian or Asian American	5%	3%	2%	8%	8%
Black or African American	6%	9%	10%	3%	5%
Hispanic or LatinX	12%	11%	3%	8%	4%

[5] Percentages do not sum to 100 as respondents could select all that apply.

Native Hawaiian or Pacific Islander	0%	0%	0%	1%	0%
White	80%	78%	85%	83%	83%
Other race/ethnicity	0%	0%	0%	0%	0%
Preferred not to disclose race/ethnicity	1%	1%	1%	1%	2%
Wave 3	**Arizona**	**Florida**	**Michigan**	**Oregon**	**Washington**
American Indian or Alaska Native	5%	3%	2%	8%	8%
Asian or Asian American	6%	5%	5%	12%	21%
Black or African American	10%	30%	18%	9%	14%
Hispanic or LatinX	12%	12%	2%	11%	11%
Native Hawaiian or Pacific Islander	0%	0%	0%	2%	4%
White	74%	58%	76%	68%	52%
Other race/ethnicity	2%	2%	2%	2%	3%
Preferred not to disclose race/ethnicity	1%	1%	2%	3%	4%
Wave 4	**Arizona**	**Florida**	**Michigan**	**Oregon**	**Washington**
American Indian or Alaska Native	2%	1%	2%	4%	3%
Asian or Asian American	3%	2%	2%	4%	7%
Black or African American	6%	13%	10%	2%	4%
Hispanic or LatinX	14%	10%	3%	5%	5%
Native Hawaiian or Pacific Islander	0%	0%	0%	0%	0%
White	80%	78%	86%	91%	86%
Other race/ethnicity	1%	1%	1%	1%	2%
Preferred not to disclose race/ethnicity	0%	0%	1%	1%	1%

Table 8.4 Household size (unweighted)

Wave 1	Arizona	Florida	Michigan	Oregon	Washington
1	24%	27%	27%	23%	27%
2	27%	36%	37%	35%	35%
3	20%	16%	16%	17%	15%
4	16%	13%	13%	14%	14%
5	7%	5%	5%	7%	5%
6	4%	2%	2%	2%	3%
7	1%	1%	1%	2%	1%
8	1%	0%	1%	1%	1%
Wave 2	**Arizona**	**Florida**	**Michigan**	**Oregon**	**Washington**
1	30%	32%	30%	24%	29%
2	35%	35%	36%	39%	36%
3	15%	14%	14%	17%	16%
4	11%	13%	13%	11%	11%
5	6%	4%	5%	6%	5%
6	2%	2%	2%	2%	3%
7	1%	1%	1%	1%	1%
8	1%	0%	0%	1%	1%
Wave 3	**Arizona**	**Florida**	**Michigan**	**Oregon**	**Washington**
1	32%	31%	30%	21%	26%
2	33%	34%	35%	40%	36%
3	14%	15%	14%	18%	14%
4	13%	12%	13%	12%	14%
5	5%	6%	6%	6%	6%
6	2%	1%	2%	2%	3%
7	0%	0%	1%	1%	1%
8	1%	1%	0%	1%	2%
Wave 4	**Arizona**	**Florida**	**Michigan**	**Oregon**	**Washington**
1	27%	30%	26%	23%	26%
2	36%	35%	37%	39%	36%
3	19%	17%	16%	17%	19%
4	12%	11%	12%	13%	13%
5	4%	5%	6%	6%	4%
6	1%	2%	2%	2%	2%
7	1%	0%	1%	0%	0%
8	0%	0%	0%	1%	1%

Table 8.5 Household income (unweighted)

Wave 1	Arizona	Florida	Michigan	Oregon	Washington
Less than $19,999	13%	12%	13%	16%	12%
$20,000 - $39,999	23%	22%	21%	22%	19%
$40,000 - $59,999	21%	19%	18%	18%	17%
$60,000 - $79,999	12%	13%	13%	13%	14%
$80,000 - $99,999	9%	7%	7%	7%	9%
$100,000 - $119,999	5%	5%	6%	5%	5%
$120,000 - $139,999	3%	5%	5%	4%	4%
$140,000 - $159,999	3%	4%	3%	3%	4%
$160,000 - $179,999	1%	1%	1%	1%	2%
$180,000 - $199,999	1%	2%	1%	1%	2%
$200,000 or more	2%	3%	2%	3%	4%
Don’t know	3%	4%	4%	4%	5%
Prefer not to say	4%	5%	7%	3%	4%
Wave 2	**Arizona**	**Florida**	**Michigan**	**Oregon**	**Washington**
Less than $19,999	13%	13%	13%	16%	13%
$20,000 - $39,999	21%	20%	22%	19%	20%
$40,000 - $59,999	21%	19%	20%	16%	16%
$60,000 - $79,999	13%	13%	15%	16%	11%
$80,000 - $99,999	10%	11%	9%	9%	12%
$100,000 - $119,999	6%	5%	6%	8%	7%
$120,000 - $139,999	3%	3%	4%	4%	5%
$140,000 - $159,999	4%	4%	2%	5%	4%
$160,000 - $179,999	1%	1%	2%	1%	2%
$180,000 - $199,999	1%	1%	2%	1%	1%
$200,000 or more	2%	4%	2%	3%	4%
Don’t know	4%	4%	2%	3%	3%
Prefer not to say	2%	2%	2%	1%	2%
Wave 3	**Arizona**	**Florida**	**Michigan**	**Oregon**	**Washington**
Less than $19,999	15%	14%	12%	14%	15%
$20,000 - $39,999	20%	20%	22%	20%	19%
$40,000 - $59,999	18%	15%	15%	17%	16%
$60,000 - $79,999	12%	10%	10%	12%	13%
$80,000 - $99,999	9%	9%	11%	8%	7%
$100,000 - $119,999	6%	7%	6%	7%	5%
$120,000 - $139,999	6%	4%	6%	4%	5%

$140,000 - $159,999	4%	6%	4%	3%	3%
$160,000 - $179,999	2%	3%	2%	2%	2%
$180,000 - $199,999	2%	2%	1%	1%	3%
$200,000 or more	2%	4%	3%	4%	2%
Don’t know	3%	2%	3%	5%	5%
Prefer not to say	2%	4%	3%	5%	5%

Wave 4	**Arizona**	**Florida**	**Michigan**	**Oregon**	**Washington**
Less than $19,999	13%	11%	12%	14%	13%
$20,000 - $39,999	23%	25%	25%	20%	20%
$40,000 - $59,999	21%	21%	21%	19%	19%
$60,000 - $79,999	15%	14%	15%	14%	17%
$80,000 - $99,999	8%	8%	8%	9%	8%
$100,000 - $119,999	5%	5%	5%	6%	6%
$120,000 - $139,999	3%	4%	4%	4%	5%
$140,000 - $159,999	2%	3%	3%	4%	2%
$160,000 - $179,999	1%	2%	1%	2%	2%
$180,000 - $199,999	2%	1%	1%	2%	1%
$200,000 or more	3%	3%	2%	3%	3%
Don’t know	2%	3%	2%	1%	2%
Prefer not to say	3%	3%	3%	3%	3%

Table 8.6 Presence of adults 65+ in the household (unweighted)

	Arizona	Florida	Michigan	Oregon	Washington
Wave 1					
65+ household	15%	26%	20%	15%	18%
Mix of 65+/non-65+ members	10%	12%	8%	6%	7%
No 65+ members	76%	62%	72%	78%	76%
Wave 2					
65+ household	23%	25%	22%	20%	22%
Mix of 65+/non-65+ members	8%	8%	7%	8%	7%
No 65+ members	69%	67%	71%	72%	72%
Wave 3					
65+ household	24%	23%	24%	16%	12%
Mix of 65+/non-65+ members	7%	11%	6%	9%	7%
No 65+ members	69%	66%	70%	75%	81%
Wave 4					
65+ household	24%	22%	24%	24%	24%
Mix of 65+/non-65+ members	9%	8%	8%	9%	8%
No 65+ members	68%	69%	68%	67%	68%

Table 8.7 Presence of Children Under 18 in the Household (Unweighted)

	Arizona	Florida	Michigan	Oregon	Washington
Wave 1					
Household does not have children (0-17)	65%	71%	75%	67%	69%
Household has children (0-17)	35%	29%	26%	33%	31%
Wave 2					
Household does not have children (0-17)	74%	77%	76%	74%	75%
Household has children (0-17)	26%	23%	24%	26%	26%
Wave 3					
Household does not have children (0-17)	75%	75%	76%	73%	73%
Household has children (0-17)	25%	25%	24%	27%	27%
Wave 4					
Household does not have children (0-17)	76%	77%	74%	75%	73%
Household has children (0-17)	24%	23%	26%	25%	27%

Table 8.8 Number of workers in the household (unweighted)

	Arizona	Florida	Michigan	Oregon	Washington
Wave 1					
0	27%	33%	31%	28%	28%
1	39%	39%	38%	39%	45%
2	27%	22%	25%	26%	23%
3	6%	5%	5%	5%	3%
4	2%	1%	2%	2%	1%
5+	0%	1%	0%	1%	0%
Wave 2					
0	36%	36%	33%	33%	33%
1	29%	33%	31%	32%	32%
2	20%	17%	19%	18%	21%
3	10%	9%	12%	12%	11%
4	4%	3%	3%	4%	3%
5+	1%	2%	2%	1%	2%
Wave 3					
0	33%	35%	34%	28%	27%
1	34%	28%	32%	31%	34%
2	18%	21%	21%	23%	20%
3	10%	10%	9%	11%	13%
4	3%	4%	3%	5%	4%
5+	2%	2%	2%	2%	2%
Wave 4					
0	32%	32%	36%	33%	33%
1	30%	34%	29%	29%	32%
2	23%	20%	22%	24%	20%
3	10%	10%	9%	9%	12%
4	3%	4%	3%	4%	3%
5+	1%	2%	1%	1%	1%

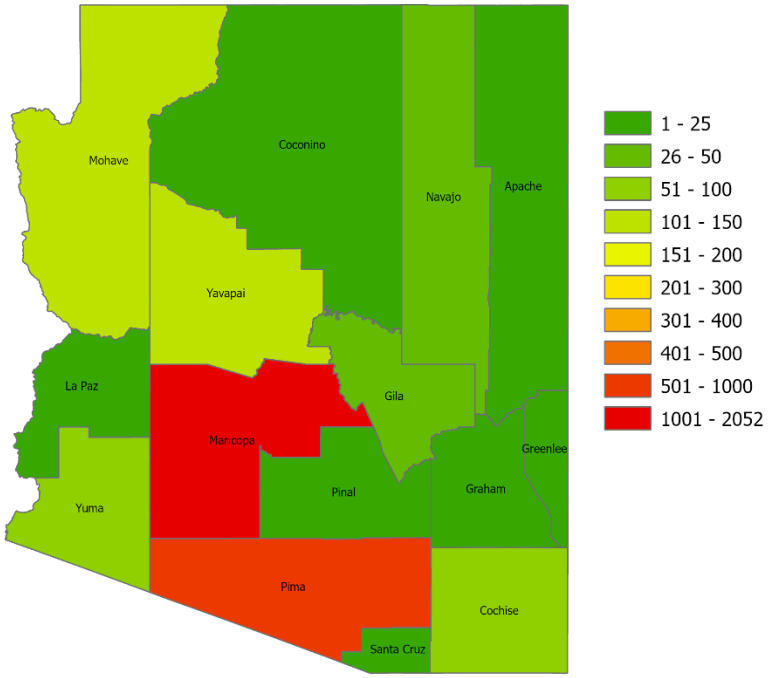

Figure 8.1 Arizona - distribution of survey responses for all four waves by county

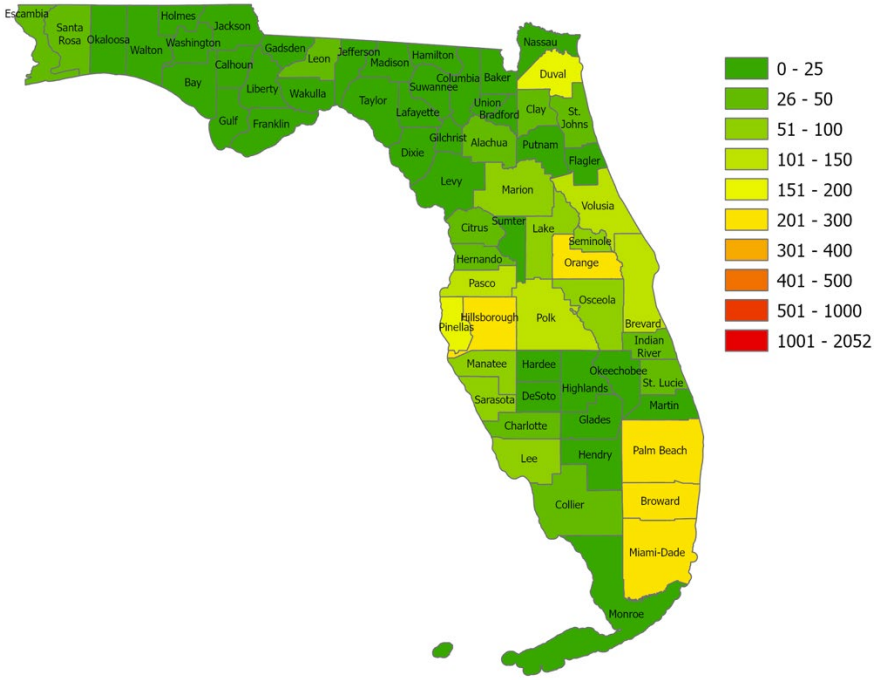

Figure 8.2 Florida- distribution of survey responses for all four waves by county

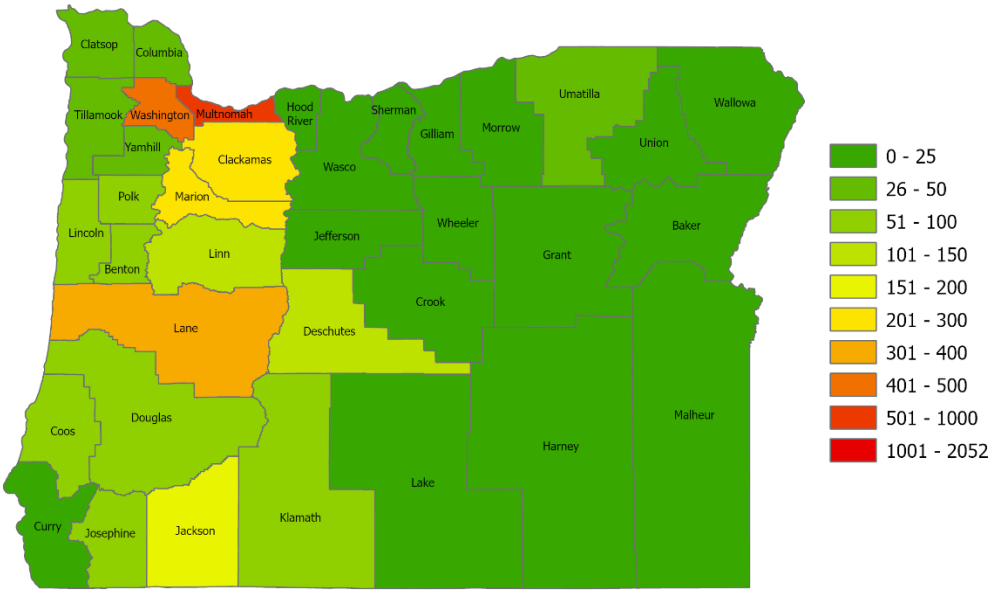

Figure 8.3 Oregon- distribution of survey responses for all four waves by county

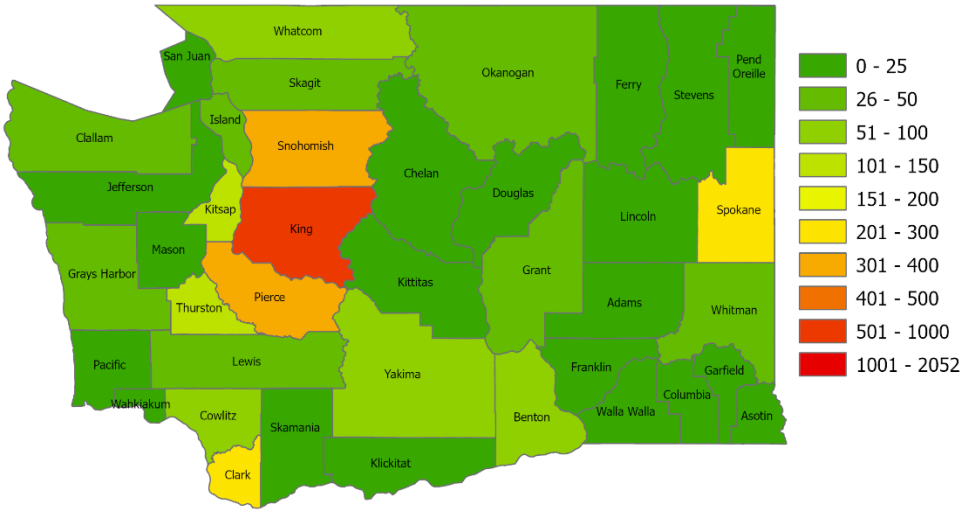

Figure 8.4 Washington - distribution of survey responses for all four waves by county

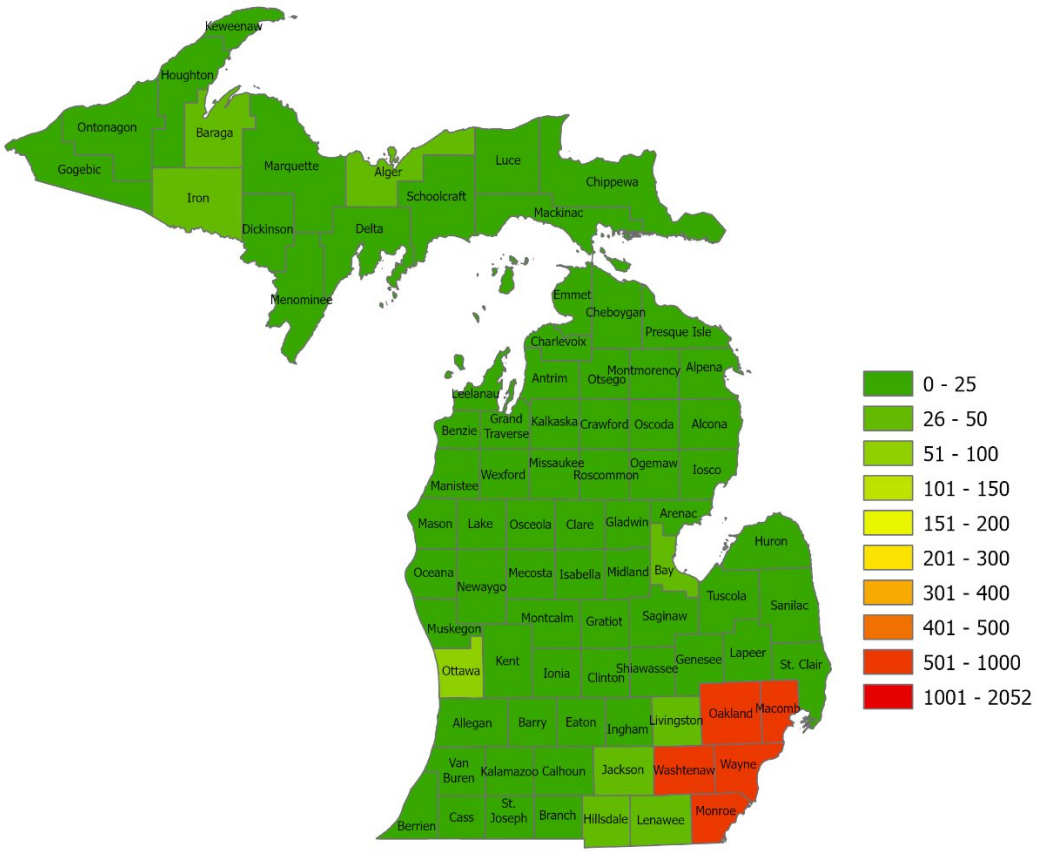

Figure 8.5 Michigan - distribution of survey responses for all four waves by county

8.3 SURVEY WEIGHTING

Weights correcting for bias in sample distribution were developed for each state and each wave of the survey. As the survey was meant to capture household consumption behaviors, we used consistent demographic information at the household level for weights of all waves and states. All survey instruments requested an estimate of 2019 annual household income, and therefore all population characteristics used for comparison were from 2019.

In this process, we selected three variables to consider as part of our weighting process: household income, household size, and the presence of children in the household. For income, we aggregated the eleven income categories collected to represent an annual estimate of 2019 income into six categories for weighting: less than $20,000; $20,000-40,000; $40,000-$60,000; $60,000-80-000; $80,000-$120,000; more than $120,000. Both household size and the presence of children are correlated, and so we developed an aggregate measure of household composition that expresses both the size and presence of children, including the categories: 1 person; 2 people; 2 people including one child; 3+ people; 3+ people including at least one child. “Children” were

identified as those 17 years or younger. The proportion distribution of households used in the weighting process for each state is provided in Table 8.9 below.

When considering the frequency of responses by income categories and household composition (size and children), there were several combinations of income and household composition that resulted in small sample sizes when segmented by state and survey wave. Therefore, we approached weighting through an iterative process, first calculating the weights by income distribution (weights #1), then by household composition (weights #2 using weights #1), repeating this process three times. This resulted in a crosstabs demographic distribution of weighted survey responses differed from the population distribution within one percentage-point.

Table 8.9 State demographics used in developing weights - 2019 American Community Survey

Demographic Variable	Arizona	Florida	Michigan	Oregon	Washington
Population	2,571,268	7,736,311	3,935,041	1,611,982	2,848,396
Household Income (Proportion of Households by State)					
Less than $20,000	15%	16%	16%	15%	12%
$20,000-40,000	20%	21%	20%	19%	15%
$40,000-$60,000	18%	18%	17%	16%	15%
$60,000-80-000	13%	13%	13%	14%	13%
$80,000-$120,000	17%	16%	16%	18%	19%
More than $120,000	17%	16%	17%	19%	25%
Household Composition (Proportion of Households by State)					
1 person	27%	29%	30%	28%	27%
2 people	34%	35%	33%	35%	34%
2 people including one child	2%	2%	2%	2%	2%
3+ people	9%	10%	10%	10%	10%
3+ people including at least one child	28%	24%	25%	25%	28%

The expansion factors allow us to compare the survey sample, summarized at a state level, to state-related comparisons. To expand the weighted survey samples, we used the *survey* package[6] in the *R* statistical programming language (function: *svytable*) expanding to the 2019 ACS state-level population estimates. The result—for each combination income and household composition—is an estimate for how people the survey response represents as part of the state.

[6] *Survey* package at CRAN: https://cran.r-project.org/web/packages/survey/index.html

As with all weighting, this process assumes that the people responding to the survey are identically distributed on questions and responses compared with those that did not respond. We reserve the use of weights to only those more aggregate comparisons of demographics and use.

While using the Qualtrics panels, we were not provided with demographic distributions that account for either the recruitment of panel participants or the nonresponse of panel participants in our survey. We performed weighting based on census estimates at a state-level. Weights should only be used to describe state- or sample-level comparisons, and not or sub-state comparisons (e.g., region, county). In the findings described below, weighted pooled samples were weighted and expanded at a state level, results for all five states were aggregated, and proportions of the "pooled" sample were provided.

8.4 FOCUS GROUP MATERIALS

Mentor Focus Group Questions

Thank you all for meeting today and participating in this focus group. Today we are here to learn about how you (and your families and/or household) shop for groceries and household items, experience with using online applications for purchasing groceries and household goods, and the impact of COVID-19 during both the pandemic and recovery periods. Before we get started, are there any questions?

To get started, we want to learn about how you all access and use communication technology in your daily lives to search for information, communicate, shop, and seek out entertainment through connecting to the internet.

Some examples could be accessing the internet using computer, tablet, or smartphone; calling and texting on a mobile phone, using smartphone applications; conducting video calls using the computer, tablet or smartphone (Facetime, Facebook Messenger, Zoom, Skype, Hangouts); watching/streaming videos and movies, and online shopping.

1. You all indicated in our recruitment survey that you have helped someone order groceries online. Is that correct? How comfortable would you say this person you've helped order groceries online is in using communications technologies on a scale from 1-10, where 1 equates to not being familiar with using communications technology and 10 equates to having a high level of knowledge and comfort in using communications technology devices daily, how would you rank this person and why?

2. What is your relationship to the person that you have assisted buying groceries and why did you help them?
    a. How long have you been helping them buy groceries?
    b. Before COVID or after?

    c. What role did COVID play in online grocery shopping?
    d. What are the biggest barriers for them shopping for groceries independently - in person or online?

3. Before teaching this person to use online grocery shopping resources, what types of technology skills did they already possess?
    a. Where did they learn these skills?
    b. What types of technology do they have access to?

4. Tell me about your experience helping them shop for groceries?
    a. How are you assisting them?
    b. What are things that they find difficult to do on their own?
    c. Delivery or pick up?

5. What kinds of things have you helped them buy online besides groceries?
    a. What about other kinds of computer or smartphone help?
    b. Tell us about your experiences.
    c. For how long have you been helping them?

6. What kind of experience do they have using computers and smartphone applications?

7. After teaching them about using these online platforms, were they able to order groceries or other things on their own?
    a. What kinds of help do they still need help with?
    b. What are they confident about?

8. As we look to the future, do you think they will continue to buy groceries online? What about other goods and services? Why or why not?

9. What is your experience buying groceries online?
    a. For yourself - have you bought your own groceries online? Why or why not?
    b. Smartphone or computer?
    c. Pick up or delivery
    d. Like it?

Wrap-up and thank you!

Older Adults Focus Group Questions

Thank you all for meeting today and participating in this focus group. Today we are here to learn about how you (and your families and/or household) shop for groceries and household items, experience with using online applications for purchasing groceries and household goods, and the impact of COVID-19 during both the pandemic and recovery periods. Before we get started, are there any questions?

To get started, we want to learn about how you all access and use communication technology in your daily lives to search for information, communicate, shop, and seek out entertainment through connecting to the internet.

Some examples -

- *accessing the internet using computer, tablet, or smartphone;*
- *calling and texting on a mobile phone,*
- *using smartphone applications;*
- *conducting video calls using the computer, tablet or smartphone (Facetime, Facebook Messenger, Zoom, Skype, Hangouts);*
- *watching/streaming videos and movies, and online shopping.*
- *buying stuff online*

1. How comfortable are you in using communications technologies on a scale from 1-10, where 1 equates to not being familiar with using communications technology and 10 equates to having a high level of knowledge and comfort in using communications technology devices daily, how would you rate yourself and why?

2. Now that we have talked about our use of technology in our daily lives, I'm going to follow up with a question on online shopping.
    a. For those of you that have shopped online: Can tell us about your most recent experience shopping online.
    b. For those of you that you have not shopped online: Can share with us some of the reasons that you have not? Would you like to?

3. Have you ever had help from others while shopping online? Can you share your experience of learning to use online shopping technologies?
    a. Who?
    b. What kinds of help?
    c. If not online shopping, what about help learning or using the communications technologies we discussed earlier?

4. What do you think of shopping online for groceries?

5. Have you ever shopped for groceries and/or household goods online?
    a. When did you first shop for groceries online and what motivated you to do so?
    b. What worked well in comparison to shopping at a grocery store? What didn't work as well?
    c. How is shopping online for groceries different from buying other things online?
    d. If not, why not? What are your concerns?

6. Do you know anyone who has ordered groceries online?
    a. What were their experiences and how have these experiences impacted your interest in trying it?

7. Regardless of how you currently shop for groceries, what would make it easier to shop for groceries?

8. Thinking about the future, how do you think your grocery shopping will be different 2 or 3 years from now?

Wrap-up and thank you!