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## Original Article

## Perceived impacts of COVID-19 on wellbeing among US working-age adults with ADL difficulty

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## ABSTRACT

**Background:** The COVID-19 pandemic has disproportionately impacted people with disabilities. Working-age adults with ADL difficulty may face unique challenges and heightened health risks because of the pandemic. It is critical to better understand the impacts of COVID-19 on social, financial, physical, and mental wellbeing among people with disabilities to inform more inclusive pandemic response policies.

**Objective:** This study compares perceived COVID-19 physical and mental health, social, and financial impacts for US working-age adults with and without ADL difficulty.

**Methods:** We analyzed data from a national survey of US working-age adults (aged 18–64) conducted in February and March 2021 (N = 3697). We used logistic regression to compare perceived COVID-19-related impacts on physical and mental health, healthcare access, social relationships, and financial wellbeing among those with and without ADL difficulty.

**Results:** Adults with ADL difficulty were more likely to report negative COVID-19 impacts for many but not all outcomes. Net of covariates, adults with ADL difficulty had significantly greater odds of reporting COVID-19 infection (OR = 2.1) and hospitalization (OR = 6.7), negative physical health impacts (OR = 2.0), and negative impacts on family relationships (OR = 1.6). However, they had significantly lower odds of losing a friend or family member to COVID-19 (OR = 0.7). There were no significant differences in perceived impacts on mental health, ability to see a doctor, relationships with friends, or financial wellbeing.

**Conclusions:** Working-age adults with ADL difficulty experienced disproportionate health and social harm due to the COVID-19 pandemic. To address these disparities, public health response efforts and social policies supporting pandemic recovery must include disability perspectives.

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The COVID-19 pandemic uniquely impacted adults with disabilities, both exacerbating existing inequalities<sup>1</sup> and creating new obstacles.<sup>2,3</sup> In addition to the direct health risks of COVID-19 to people with disabilities, the prolonged pandemic period has impacted social, financial, and mental wellbeing due to disruptions in service access, social support, employment opportunities, and more.<sup>4</sup> Yet, US COVID-19 response measures have not been

disability inclusive.<sup>5,6</sup> Research that considers the broad range of COVID-19 impacts on wellbeing is essential for informing policies to mitigate adverse outcomes among people with disabilities.<sup>7</sup>

Recent studies document how COVID-19 has exacerbated common barriers faced by adults with disabilities, including limited access to direct support, healthcare, and social connections.<sup>7</sup> However, empirical studies assessing the social, financial, and health impacts of COVID-19 on working-age adults with limitations in activities of daily living (ADLs) are lacking.<sup>8</sup> Moreover, while significant research and policy attention has been paid to the needs of older adults given their heightened vulnerability to severe illness and death from COVID-19, the same attention and policy action has not been directed towards working-age adults with activity limitations. More research is needed to assess the pandemic's toll on working-age adults, given this age group's contributions to the

**Abbreviations:** HBCS, Home and Community Based Services; ADL, Activities of Daily Living; NWS, National Wellbeing Survey.

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labor force and family caregiving, and because adverse COVID-19 impacts may influence care needs or personal resources in later life.

Accordingly, this study examines how perceived COVID-19 health, social, and financial impacts differ between working-age adults with and without ADL difficulty. We use nationally representative survey data to assess perceived impacts approximately one year into the COVID-19 pandemic, providing a timely and comprehensive description of how US working-age adults with ADL difficulty fared after a prolonged period of pandemic-related risks and disruptions. Given historical and ongoing structural barriers to achieving equitable financial, social, and health-related outcomes for adults with disabilities, including during the COVID-19 response,<sup>1,6</sup> we expect that negative impacts will be more common among adults with ADL difficulty. Our work extends the literature by assessing disparities in numerous COVID-related outcomes and by capturing both direct health impacts and impacts on social determinants of health, such as social relationships and financial wellbeing.

ADLs are related to personal care and mobility. Traditional ADL measures include dressing, eating, ambulating, toileting, and hygiene. ADL difficulties increase individuals' susceptibility to care dependency, with implications for quality of life for individuals without access to adequate care.<sup>9</sup> Individuals with ADL limitations often receive home- and community-based services (HCBS) to help with ADLs and specialized medical care.<sup>10</sup>

Existing research shows that older adults reporting ADL limitations have higher rates of adverse health outcomes, including mortality, chronic conditions, and poor mental health.<sup>11,12</sup> Although ADL difficulty is often viewed as primarily a concern for older adults, and especially the "oldest old," a growing body of research suggests that difficulty with ADLs is common in younger ages.<sup>10,13,14</sup>

The COVID-19 pandemic increased risks of serious illness and death, reduced access to healthcare and community-based services, increased unemployment rates and financial strain, and adversely impacted social relationships.<sup>4</sup> Working-age adults with ADL difficulty may be especially susceptible to these negative impacts due to the higher prevalence of chronic conditions, less financial resources, and reduced access to healthcare and community-based services for people with disabilities,<sup>15</sup> including ADL difficulty.

### Physical health impacts

Research suggests that people with disabilities are more likely to have severe health risks from COVID-19,<sup>16</sup> reflecting a higher risk of contracting coronavirus<sup>2</sup> and higher fatality rates.<sup>3</sup> Many people with disabilities have chronic health conditions, potentially increasing illness severity or hospitalization upon contracting COVID-19.<sup>17</sup> COVID-19 related restrictions, such as business closures and stay-at-home orders, may have created barriers to accessing healthcare, medications, or other necessary services and supplies.<sup>18</sup>

People with ADL difficulty who rely on HCBS experienced significant pandemic-related disruptions. Accessing HCBS became more challenging as home care workforce shortages worsened, and many home care clients canceled services to avoid potential coronavirus exposure from aides.<sup>19</sup> Many individuals with ADL difficulty who lost access to formal care either went without essential supports or relied on unpaid care from family members or friends.<sup>19–21</sup> Those who continued receiving HCBS or care from family or friends faced a heightened risk of contracting coronavirus due to the close contact required to provide support to people with ADLs.<sup>3,18</sup> For many with ADL difficulty, consistent access to quality care is essential for maintaining health and managing chronic conditions.<sup>22</sup> Disruptions to these services may have adversely affected health.

### Mental health impacts

Adverse mental health impacts may reflect concerns about exposure and/or the stress of service disruption. Depressive symptoms and suicidal ideation were more common among adults with disabilities in the early months of COVID-19, reflecting higher rates of reported psychosocial, interpersonal, and financial stressors.<sup>23,24</sup> Data from Finland showed that adults with disabilities were more concerned about being infected and were more likely to report being lonely compared to those without disabilities.<sup>25</sup> People with ADL difficulties may also have difficulty receiving mental health treatment during COVID-19 due to dramatic increases in demand and barriers to accessing services.<sup>26</sup>

### Social relationships

COVID-19 dramatically altered the frequency and type of social connections for the general public, but social relationships may have been especially impacted for people with ADL difficulties. Increased reliance on family members, and possibly friends, for support with ADLs may have negatively affected interpersonal relationships.<sup>21,27</sup> Relationships with friends may also become strained due to concerns about disease transmission and less frequent social interaction. However, certain COVID-19 response measures, such as increased technology use for remote work and healthcare, as well as more virtual social connections compared to prepandemic, may have buffered against some of these adverse social outcomes for adults with ADL difficulty.<sup>7</sup> Adults with ADL difficulties may also face a heightened risk of losing friends, family members, or colleagues during the pandemic given the heightened health risks COVID-19 presents for members of the disability community.<sup>28</sup>

### Financial impacts

Prepandemic, adults with disabilities were more than twice as likely to live in poverty as those without disabilities, reflecting both labor market inequalities and social and health policies.<sup>29</sup> People with disabilities have historically been disproportionately impacted during economic downturns. For example, during the Great Recession, already high unemployment rates were even higher among adults with disabilities,<sup>29,30</sup> suggesting that negative financial impacts due to pandemic-related economic disruption may be more common among working-age adults with ADL difficulties. In September 2020, Brucker, Stott, and Phillips (2021) found higher rates of free food resource use and higher rates of food insufficiency for working-age adults with disabilities compared to those without.<sup>31</sup> However, the federal COVID-19 response included an unprecedented increase in benefits to reduce financial hardships, including stimulus checks, rental assistance, and more generous SNAP and unemployment benefits,<sup>32</sup> which may have reduced economic distress for people with ADL difficulties.

### Methods

#### Data

This study uses data from the National Wellbeing Survey (NWS), collected by researchers at the Syracuse University Lerner Center for Public Health Promotion.<sup>33</sup> The NWS is a national cross-sectional survey of US adults ages 18–64 (N = 4014). The survey was administered online through Qualtrics from February 1 to March 18, 2021. Qualtrics Panels is an online survey platform that maintains a database of several million US adults who volunteer

to participate in surveys. Online panels are increasingly used in social science research due to efficiency, cost, timeliness, and data quality.<sup>34</sup> Qualtrics recruits panel members from various sources, including website intercept recruitment, member referrals, targeted email lists, gaming sites, customer loyalty web portals, permission-based networks, and social media. Qualtrics panel members' names, addresses, and dates of birth are typically validated via third-party verification. Qualtrics compensates respondents in various ways, such as airline miles and gift cards, to which respondents agreed when they joined the panel. For our survey, panel members received an invitation with a hyperlink to the NWS. The average time for survey completion was 22.9 min. The completion rate, calculated based on those who accessed the NWS landing page, reviewed the informed consent, and met the age eligibility criteria and data quality threshold,<sup>1</sup> was 40.4%. When weighted, respondents are representative of the US population ages 18–64 by age, sex, race/ethnicity, education, and metropolitan status. We have previously shown that prevalence rates on several NWS items that capture health conditions and COVID-19 experiences and outcomes are comparable to those from other national surveys, including the Census Household Pulse Surveys that were conducted during the same weeks as the NWS.<sup>35</sup>

We addressed missing data using listwise deletion. We dropped 7.9% (N = 317) of respondents with missing responses on any of the variables included in our analysis, leaving us with an analytic sample of 3697.<sup>2</sup> Respondents dropped from the sample did not differ significantly from the remaining sample on any COVID-19 impact variables. However, dropped respondents were significantly more likely than the remaining sample to be female, non-White, unmarried, have less than a 4-year college degree, and report one or more ADL difficulties. They also reported smaller average household sizes.

#### Independent variable

We assessed ADL difficulty using a series of questions that began with the prompt: "Please tell us whether you have any difficulty doing each of the activities listed below. Exclude any difficulties that you believe are temporary (e.g. that you expect to last less than three months)." Respondents were asked to select "no difficulty," "some difficulty," or "a lot of difficulty" for five activities: (1) Eating, such as cutting up your food; (2) Using the toilet, including getting up and down; (3) Bathing or showering; (4) Getting out of bed or up from a chair; and (5) Dressing, including putting on shoes and socks. We categorized respondents as having ADL difficulty if they selected "a lot of difficulty" for one or more activities. We dichotomized responses so that those with ADL difficulty were coded as "1" and those with no ADL difficulty were coded as "0." We chose the stricter definition of "a lot of difficulty" because we felt "some difficulty" was a less meaningful indicator of respondents' functional status. However, we conducted sensitivity analyses using a broader ADL definition that included both "some" or "a lot of" difficulty. Results of sensitivity analyses are shown in [Appendix 1](#) and briefly summarized at the end of the results section.

<sup>1</sup> Qualtrics conducted extensive data quality checks. Surveys were checked for flatlining, multiple-response, inattention, speeding, and garbage, suspicious, and profane responses to text questions. Surveys failing to meet Qualtrics' data quality threshold were dropped.

<sup>2</sup> 40 respondents (1%) were dropped because they had missing responses on one or more demographic or COVID-19 impact questions; 277 respondents (6.9%) were dropped because they responded "non-applicable" to one or more COVID-19 impact question.

#### Dependent variables

Respondents self-reported COVID-19 infection and hospitalization and the effects of COVID-19 on their mental health, physical health, healthcare use, relationships with family and friends, and financial wellbeing. NWS survey questions were worded such that the respondents themselves attributed the causal impact of COVID-19 on their wellbeing.

*COVID-19 infection* and *COVID-19 hospitalization* were captured through dichotomous items prefaced with "Which of the following experiences of COVID-19 applied to you?": Respondents who responded "yes" to either "I received a test for coronavirus, and it came back positive" or "I suspected I had coronavirus based on symptoms, but I never got tested" were coded as "1" for COVID-19 infection. COVID-19 hospitalization was captured via: "I was hospitalized due to coronavirus." Respondents who responded "yes" were coded as "1."

*Global physical health impact* was captured with the item: "Overall, please rate how the COVID-19 pandemic has affected the following aspects of your life: physical health," with a 5-point response scale of "substantially improved" to "substantially worsened." An item with the same wording was used to capture *global mental health impact*. We dichotomized responses so that respondents who reported somewhat or substantially worsened health were coded as "1." *COVID-19 healthcare access impact* was measured with the item "Was there a time in the past 12 months when you needed to see a doctor but could not: because of COVID-19?" "Yes" responses were coded as "1."

*Social impacts* were captured with two items. Both items prompted: "Overall, please rate how the COVID-19 pandemic has affected the following aspects of your life" - "relationship with immediate family" and "relationship with friends." Responses were captured on a 5-point scale of "substantially improved" to "substantially worsened." We coded respondents who reported "somewhat or substantially worsened" relationships as "1." *Loss of a friend or family member to COVID-19* was captured with a dichotomous item: "Which of the following experiences of COVID-19 applied to you?: family member or friend died from coronavirus;" we coded "yes" responses as "1."

*Financial impact* was captured with: "Overall, please rate how the COVID-19 pandemic has affected the following aspects of your life—financial situation," with a 5-point response scale of "substantially improved" to "substantially worsened." We coded respondents who reported "somewhat or substantially worsened" as "1."

#### Covariates

Covariates included age (continuous), sex (male, female, other), racialized status (non-Hispanic [NH] White, NH Black, Hispanic, Other Race), educational attainment (less than 4-year college degree vs. 4-year college degree or more), marital status (married vs. unmarried), and the number of people in the household. We selected these covariates because they could plausibly affect both the independent variable (ADL difficulty) and dependent variables (COVID-19 impacts), and are, therefore, potential confounders.<sup>36–38</sup> We did not control for income or employment status because, rather than confounders, they may be potential pathways (mediators) through which ADL difficulties influence COVID-19 impacts. As a sensitivity check, we ran models that included income and employment status, and the results did not meaningfully change (see [Appendix 1](#)).

#### Analytic plan

We first present descriptive statistics for the sample overall and by ADL difficulty status. We used adjusted Wald tests to identify

statistically significant differences in the prevalence of negative COVID-19 impacts between respondents with versus without ADL difficulty. We then conducted logistic regression to predict the odds of reporting negative COVID-19 social, financial, and health impacts based on ADL difficulty. We first present coefficients from unadjusted logistic regression models. We then show the results from adjusted models. All models are weighted and include clustered standard errors at the state level. Statistical analyses were conducted using STATA 16.1.

**Results**

Just over 10% of the sample reported difficulty with one or more activities of daily living. Table 1 presents demographic characteristics for those with and without ADL difficulty. Table 2 presents prevalence rates of self-reported COVID-19 impacts for those with and without ADL difficulty. There are several significant differences. Respondents with ADL difficulty were more likely to report negative physical health and mental health impacts. They also had much higher rates of COVID-19 infection and hospitalization. Those with ADL difficulty were significantly more likely than those without to report negative impacts on relationships with family and friends. However, respondents with ADL difficulty were significantly less likely to report losing a friend or family member to COVID-19. There were no significant differences in reported financial impacts or ability to see a doctor.

Table 3 presents the results of logistic regression models predicting COVID-19 impacts for those with versus without ADL difficulty (coefficients of all variables in adjusted models for each outcome are reported in Appendix Table S1). Given little change in coefficients between the unadjusted and adjusted models, we summarize only the adjusted models here. Net of controls, respondents with ADL difficulty had significantly greater odds of reporting negative health and social impacts due to COVID-19.

**Table 1**  
Descriptive Statistics for Sample Overall and by ADL Difficulty (Weighted percent).

	Overall Sample (N = 3697)	ADL difficulty (N = 374) (10.1%)	No ADL difficulty (N = 3323) (89.9%)
Gender			
Male	49.1	51.3	48.8
Female	50.1	46.8	50.4
Nonbinary/other	0.8	1.9	0.7
Race/Ethnicity			
Non-Hispanic white	61.3	56.2 <sup>^</sup>	61.8
Non-Hispanic black	12.1	13.6	11.9
Hispanic	18.5	22.2	18.1
Other and 2 or more races	8.1	8.0	8.1
Age (mean)	40.7	37.0***	41.2
Educational Attainment			
No college degree	61.7	65.5	61.2
Bachelor's or higher	38.3	34.5	38.8
Marital status			
Married	54.6	53.7	54.7
Not married	45.4	46.3	45.4
Household composition			
Number of people in household	3.1	3.4***	3.0
Household Income in 2019			
Low income (<\$40,000)	41.2	44.9	40.8
Employment Status <sup>a</sup>			
Employed	62.0	67.4*	61.4
On short- or long-term disability	7.9	13.1***	7.3
Other	32.4	31.3	32.5

NOTES: N = 3679.

<sup>^</sup>p<0.10; \*p<0.05; \*\*p<0.01; \*\*\*p<0.001

<sup>a</sup> Respondents could select as many employment status categories as applied to them (e.g., employed and a student), so percentages do not add to 100.

Specifically, adults with ADL difficulty had twice the odds of reporting negative physical health impacts (OR = 2.03; 95% CI: 1.63–2.52, p < 0.001), 2.1 times the odds of having a COVID-19 infection (OR = 2.11; 95% CI: 1.46–3.04, p < 0.001), and 6.7 times the odds of being hospitalized for COVID-19 (OR = 6.65; 95% CI: 4.23–10.46, p < 0.001). Respondents with ADL difficulty also had 29% greater odds of negative mental health impacts (OR = 1.29; 95% CI: 0.97–1.74, p = 0.083). In terms of social impacts, respondents with ADL difficulty had 57% greater odds of reporting that COVID-19 negatively impacted their relationships with family (OR = 1.57, 95% CI: 1.27–1.94, p < 0.001). However, respondents with ADL difficulty had 35% lower odds of reporting losing a friend or family member to COVID-19 (OR = 0.65, 95% CI: 0.45–0.95, p = 0.026). There were no significant differences in reported impacts on relationships with friends or financial impacts.

*Sensitivity analyses*

In sensitivity models that included income and employment (Appendix Table S2), the direction, magnitude, and significance of the associations were similar to those in the adjusted model reported in Table 3. Alternative operationalization for age (age category, age-squared) did not alter the findings. Results were also similar in sensitivity models that controlled for COVID-19 infection (Appendix Table S3). In sensitivity models that used the expanded definition of ADL difficulty as those reporting “some” or “a lot of” difficulty with one or more ADLs (Appendix Table S4), the findings were similar to those shown in Table 3 for most outcomes. However, the magnitude of the OR for financial impacts reversed from 0.90 to 1.16, and the coefficient for losing a friend or family member to COVID-19 became insignificant. In addition, the coefficient for inability to see a doctor due to COVID-19 increased and became significant (p = 0.016), as did the coefficient for negative impact on relationship with friends (p < 0.001).

**Table 2**  
Prevalence of negative COVID-19 impacts by ADL difficulty (weighted).

	Overall Sample (N = 3697)	ADL difficulty (N = 374) (10.1%)	No ADL difficulty (N = 3323) (89.9%)
Negative physical health impacts	30.6	45.2***	28.9
Negative mental health impacts	38.9	45.5*	38.2
COVID-19 infection	17.8	30.5***	16.4
COVID-19 hospitalization	1.5	7.2***	0.9
Could not see doctor because of COVID-19	17.4	19.5	17.2
Negative impact on relationship with family	21.2	29.9***	20.2
Negative impact on relationships with friends	25.9	32.1**	25.2
Lost friend or family member to COVID-19	13.7	8.4**	14.1
Negative financial impacts	36.0	36.1	36.0

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001  
NOTES: N = 3697.

**Discussion**

Individuals with a disability have experienced disproportionate health and social impacts during the COVID-19 pandemic,<sup>2,7,27</sup> reflecting both prepandemic disparities and insufficient disability-inclusive pandemic responses. By using data from a timely and novel survey of working-age adults, this study presented differences in perceived COVID-19 health, social, and financial impacts between individuals with and without ADL difficulty approximately one year after the pandemic began in the United States. Results demonstrate that working-age adults with ADL difficulty faced heightened health risks and social impacts, both from the virus itself and from pandemic-related disruptions. There are several important takeaways with implications for policy.

First, working-age adults with ADL difficulty were more likely to report negative health impacts, including COVID-19 infection and hospitalization and negative impacts on physical and mental health. These findings align with previous studies documenting disproportionate health impacts for people with disabilities.<sup>2,7</sup> Higher rates of COVID-19 infection for adults with ADL difficulty may reflect barriers to avoiding exposure, including the need for close contact for personal care.<sup>7,18</sup> Our finding of dramatically greater odds of COVID-19 hospitalization for adults with ADL difficulty aligns with Kamalakannan et al.'s (2021)<sup>2</sup> scoping review of health risks of COVID-19 infection for people with disabilities and may reflect a combination of greater prevalence of comorbidities and delayed or restricted access to public health information for adults with ADLs. Worse physical health impacts may be explained by reduced access to home care, delays in seeking medical care, and heightened risk from COVID-19 itself. We also found slightly greater odds of negative mental health impacts for adults with ADL

difficulty. This finding is in line with Okoro et al. (2021),<sup>23</sup> who found higher rates of depressive symptoms, mental distress, suicidal ideation, and substance use for adults with self-care disabilities compared to those without in the early months of the pandemic. Our finding affirms the call by Mitra and Turk (2021)<sup>26</sup> for policy action to support inclusive, accessible, and affordable behavioral health services for adults with disabilities, including those with ADL difficulty.

Second, unlike Czeisler et al.' (2020)<sup>39</sup> study that showed disruptions to healthcare access among people with disabilities, we did not find significant differences in reported ability to see a doctor because of COVID-19 between adults with versus without ADL difficulties. Differences in question wordings likely explain the difference in findings. Czeisler et al.' study asked about avoiding or delaying medical care, while the NWS asked about inability to see a doctor due to COVID-19.

Third, despite worse reported health impacts, we did not find worse financial impacts among people with ADL difficulty. It is possible that COVID-19 did not have a differential effect on financial wellbeing because people with disabilities were already financially disadvantaged,<sup>29</sup> and there were fewer financial/employment losses to be had.<sup>40</sup> More generous safety net programs during the pandemic response, such as stimulus checks, extended unemployment, and expanded SNAP benefits may also have reduced financial stress for adults with ADL difficulties.

Finally, differences in reported impacts on social relationships were mixed. Working-age adults with ADL difficulties were more likely to report that COVID-19 had a negative impact on their relationship with family, but there was no significant difference in impacts on relationships with friends. Okoro et al. (2021)<sup>23</sup> found that adults with a disability were more likely to report conflict or

**Table 3**  
Logistic regression results predicting odds of reporting negative COVID-19 impacts for working-age adults with ADL difficulty compared to those without difficulty.

Effect	Unadjusted Model		Adjusted Model	
	OR	95% CI	OR	95% CI
Negative physical health impacts	2.01***	1.66–2.43	2.03***	1.63–2.52
Negative mental health impacts	1.29*	0.96–1.72	1.29*	0.97–1.74
COVID-19 infection	2.26***	1.61–3.19	2.11***	1.46–3.04
COVID-19 hospitalization	7.81***	4.89–12.48	6.65***	4.23–10.46
Could not see a doctor because of COVID-19	1.10	0.79–1.53	1.08	0.77–1.51
Negative impact on relationship with family	1.56***	1.28–1.90	1.57***	1.27–1.94
Negative impact on relationships with friends	1.23*	0.97–1.55	1.19	0.96–1.48
Lost friend or family member to COVID-19	0.64**	0.45–0.89	0.65*	0.45–0.95
Negative financial impacts	0.90	0.75–1.10	0.91	0.75–1.10

\*p<0.10; \*\*p<0.05; \*\*\*p<0.01; \*\*\*\*p<0.001

NOTES: N = 3697. The adjusted model controls for age, sex, race/ethnicity, education, marital status, and the number of people in the household. Both models cluster standard errors at the state level.

stress within the household in the early months of the pandemic. Negative impacts on family relationships may reflect increasing reliance on informal care due to disrupted access to home care or community-based services. Social distancing measures reduced in-person social connection outside the household, especially for those at risk of severe illness from COVID-19, potentially straining relationships with family outside of the household and increasing the demands for support from the family within the household. Interestingly, we found that adults with ADL difficulty had significantly lower odds of reporting losing a friend or family member to COVID-19. This may suggest that the social networks of adults with ADL difficulty adopted more stringent precautions to reduce risk of infecting their friend or family member with ADL difficulty, and in-so-doing, they protected themselves against infection. This finding may also reflect fewer social ties for those with ADL difficulty.

Unequal COVID-19 pandemic-related impacts for people with ADL difficulties across multiple domains highlight the importance of structural factors that drive unequal vulnerability.<sup>6,15</sup> Systemic changes are needed to address worse outcomes among people with ADL difficulties during public health emergencies and beyond. The Better Care Better Jobs Act would improve access to HCBS for adults with ADL difficulty, presenting opportunities to improve health outcomes and social supports for this population.<sup>41</sup>

### Limitations

Findings should be considered in light of some limitations. Given the dramatic variation between ADL measurement approaches and question wording<sup>42</sup> and the infrequent inclusion of ADL questions on surveys of working-age adults, it is challenging to compare our findings with other studies on COVID-19 impacts on adults with disabilities. However, our study's assessment of difficulty performing ADLs aligns with common conceptualizations of "self-care disability."<sup>43</sup> Also, as Epstein (2021)<sup>7</sup> reported, the pandemic's impacts vary between disability subgroups, and our findings should not be considered representative of the entire disability community. Although the NWS is weighted to be representative of the US working-age (18–64) population by age, sex, race/ethnicity, education, and metropolitan status, it is not necessarily representative of people with ADL difficulty. Our sample may underrepresent respondents unable to access an online survey and those who were most severely impacted by or who died of COVID-19 prior to the survey's administration. As a result, our estimates of disparities in COVID-19 impacts for adults with ADL difficulty are likely conservative — underestimating the magnitude of adverse outcomes among those with ADL difficulty.

Due to the cross-sectional design of the NWS and the limited variables included, we were also unable to assess how long respondents have had ADL difficulty or identify the underlying cause of respondents' ADL difficulties. It is possible that for some respondents, COVID-19 infection led to the reported difficulty. However, this possibility could apply only to the 30.5% of respondents with ADL difficulties who reported having a COVID-19 infection, and our sensitivity analyses confirmed that COVID-19 infection did not explain our findings. The NWS also did not assess whether respondents received direct care services before or during COVID-19 and if care was received at home or in an institutional setting. Future research should build on the work of Landes, Turk, and Wong (2021) to explicitly examine how the type of residence and care needs influence COVID-19 health impacts.<sup>44</sup>

Finally, while our sample of 3697 is large enough to provide ample power for analyses, we dropped 7.9% of the original sample (N = 4014) that were missing variables of interest.

Despite these limitations, this is the first study to consider differences in health, social, and financial impacts from COVID-19 for

people with versus without ADL difficulty using a national sample of working-age adults—a population hit especially hard by COVID-19's economic and social consequences.<sup>45</sup>

### Conclusions

Our findings present a nuanced picture of the experiences of working-age adults with ADL difficulty one year into the COVID-19 pandemic and point to an urgent need to develop disability-inclusive public health and social policy approaches to reduce disparities that were exacerbated by the pandemic. Adults with ADL difficulty reported greater odds of experiencing COVID-19 infection and hospitalization and negative impacts on their physical and mental health and relationships with family. These findings reflect the importance for researchers and policymakers to consider both direct COVID-19 health outcomes as well as secondary impacts associated with broader pandemic-related disruptions. The needs of people with disabilities, including those with ADL difficulty, must be included in policy decisions now and in future public health emergencies to reduce adverse outcomes.

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### Conflicts of interest

The authors have no conflicts of interest to declare.

### Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.dhjo.2022.101337>.

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