nTIDE Deeper Dive: Work Setting and COVID-19 Vaccination Trends 7/21/2023

Hello and welcome everybody to the National Trends on Disability Employment or nTIDE Lunch and Learn series. Just a few housekeeping items before we begin. We will post an archive of each webinar each month on our website at www.researchondisability.org/nTIDE This site will also provide copies of the presentations, the speaker's bios, full transcripts, and other valuable resources. As an attendee of this webinar, you are a viewer.

To ask questions of the speakers click on the Q&A box on your webinar screen and type your questions into the box. Speakers will review these questions and provide answers during the last section of the webinar. Some questions may be answered directly in the Q&A box. If you have any questions following this recording, please contact us at disability.statistics@unh.edu or toll free at 866-538-9521 for more information. Thanks for joining us and enjoy today's webinar.

**Andrew Houtenville:** Hi everybody. This Andrew Houtenville from the University of New Hampshire. Welcome to nTIDE, just a few notes. To see the interpreter and the gallery of speakers at the same time, we recommend you use a computer or a laptop rather than a phone or a tablet. Also for closed captioning, click on the closed caption button and select from show subtitles or view a running transcript.

About nTIDE, about the nTIDE deeper dive. It occurs on the noon eastern time on two weeks after the first Friday. The first Friday nTIDE report, which is released the first Friday. It's a joint effort at the University of New Hampshire Kessler Foundation and the Association of University Centers on Disability, AUCD. Each month the deeper dive focuses on a specific sub population within the population with disabilities.

In past months we've done people with disabilities identifying as African American, identifying as Hispanic, visual impairment. To name some others, I think, to name a few. We'll bring in also a guest speaker to provide greater content. This month we're going to be a little bit different. We're going to start off with the welcome. I'll moderate; I'll present and review the statistics for the first Friday. But then we're going to go through something a bit different, and we'll be interested to see what your opinion of it is.

We're going to have a guest speaker, Nate Thomas. From where I'm at, he's actually in the room right next door over there. Nate is going to present research data using a different survey than is used for the Population Survey conducted by the Bureau of Labor Statistics. Nate is going to use survey conducted by the Census Bureau. And it's the Household PULSE Survey, which was developed right at the beginning of the pandemic, has really interesting data on things like vaccination, vaccine hesitancy, and employment.

Nate's going to present some of his findings from that data source. It's going to be kind of a retrospective on Covid because we're going to go back to a period where vaccinations were just about settling in. All right. So let's take a look. Let's go to the numbers. Just to repeat the July's first Friday nTIDE results. The employment to population ratio this is May, June was the new month, so this is May.

Then I'll just quickly snap. The latest numbers we have on the employment of people with disabilities, people without disabilities is that the same for people with disabilities, a little higher for people without disabilities. People without disabilities, on their pre-covid levels, people without disabilities are after a dip that may be seasonally related or sample size related. People with disabilities are really starting to hover, say 37%.

We're hoping that doesn't mean an end to the rapid rises we've seen since covid the lockdown in April 2020. For the last few months, it's been hovering, hovering around 37% percent. We're going to be looking forward in the next few months to see, you know like everybody else is doing, seeing whether a recession occurs, whether the actions of the Federal Reserve Bank to slow the economy’s- to slow inflation.

Just heard some really bad rent numbers for New Hampshire but hoping to slow inflation by the economy. And that may affect the employment of people with disabilities. Going to labor force participation. A very similar story, people with disabilities are starting to level off around 40% a little bit down this past month. Right around the 39 - 40% rate.

People without disabilities, similarly, are starting to stretch a bit beyond their pre pandemic levels to around 78%. Again, the gap between people with and without disability is substantial. If you're interested in finding out more, we can certainly send you some information. Particularly a Kessler Foundation and UNH study that looked at supervisor perspectives on accommodation and remote work pre and post the pandemic.

All right, so now I'm going to turn it over to Nate. Nate Thomas is a research scientist here at the University of New Hampshire. Data scientists here at the University of Hampshire. He is working primarily on projects funded by the National Institute on Occupational Safety and Health. And some of what you'll hear today is really driven by his focus in the area of occupational...

This idea we heard early in the pandemic. Essential workers and essential work settings and work from home. We'll be hearing about that, but in the context of he's going to move quickly from employment to vaccination rates, and we're going to look at relative vaccination rates between people with and without disabilities, as well as within the population with disabilities. I'm going to turn it over to Nate. Take it away. He's going to do his own slides.

**Nate Thomas:** I will do that. Just give me one second, I apologize. All right.

**Andrew Houtenville:** My audio has been cutting out now and then, [reading from an off-screen message] “Are you leaning on your cord?” I don't know.

**Nate Thomas:** All right. Here we go. Share my screen. Okay. And I'm just going to put this in a presentation mode. I appreciate everyone's patience. All right. Can everyone see that?

**Andrew Houtenville:** Yes, I can.

**Nate Thomas:** Perfect. Okay. So yeah, again, just to reiterate, you can see the disclaimer here. What we're going to be looking into is Covid 19 vaccination patterns workers with disabilities within work settings. I was also working with my colleague Liu Yang on some of the upfront work here. Just wanted to make sure to recognize.

So some background. Basically essential workers are at particularly high risk. And was found just due to covid vaccination and their necessity to be in the workplace. Full time workers with disabilities experience reduced access to health care.

I think Andrew, you are particularly familiar with that particular paper noted there, and in December 2020, there was a phased approach in the United States to the Covid 19 vaccine. And as, kind of directing what we're trying to do here, we are looking into subgroups of employment demographics nationally and at state level, including comparisons, workers at home, and the applicable demographics. And get into what all of that means, just kind of give context of what we're looking to try and do.

**Andrew Houtenville:** You may want to slow down a little bit for the interpreters.

**Nate Thomas:** I apologize.

**Andrew Houtenville:** Every once in a while you ramp it up.

**Nate Thomas:** Thank you so much. Yeah, I do tend to speak quickly, so I will do my best to slow down a bit. Again, the analysis that we did was based on household .... and in 2020. The question related to vaccination was at the January of 2021 and that phase, phase three is the phase number given by the PULSE survey itself. And they had a number of different phases in releases and changes into the structure.

Starting in April of 2021 as well, in Phase 3.1 they started asking about employment. And specifically, most important to us here was essential work setting, and we focused on that late stage, starting in August 2021, August 2022, to get effectively, a year of pooled data, so that we could pull in those standard errors or have a little less uncertainty around our estimates. And we will see what all that looks like here in just a little bit.

Just for clarity on what was meant by essential work setting, so the full set’s in phase 1b. This phase is actually related to the vaccine distribution phase outlined by the CDC. And it incorporated work settings like health care, social service, death care, education in the various locations that are noted there. First response correctional facilities, agriculture, forestry, fishing and hunting. Food manufacturing, food and beverage stores, non-food manufacturing as well, public transit, United States Postal Service, which was a carved-out work setting specific, especially I can understand its inclusion just based on the survey being by the US Government.

Then also respondents were given the option to respond all “other” work setting deemed essential effectively during the Covid 19 pandemic and whatever that was in terms of their interpretation. If they were told or had the evaluation that they were essential, they were given that option to also respond that way. And then the other work settings that were included in the dataset were effectively none of the above.

So none of those that we outlined above, but these are workers that work outside of the home, so they're quote unquote non-essential but not remote. And then there was a setting basically listed as missing data, in that case, the person hadn't provided that information.

And then another independent group which was workers at home, which was effectively a synthetic setting that we used to, or we use other questions that defined whether someone worked outside of the home to then interpret whether they worked inside the home and as a worker from home. Included in the dataset were four questions around disability, and these are those four questions, and we allocated effectively an indicator of with or without disability based on these four.

So if the respondent had responded effectively yes, to any of these that you see here, do you have difficulty seeing, do you have difficulty hearing, difficulty remembering or concentrating, or do you have difficulty walking or climbing stairs? Then that was interpreted as a part of the research that we did as a person with disability.

Just a quick summary, high level in terms of some of the groupings that we've just discussed and the employment population ratios. Overall within that time frame, and this is specific to the PULSE survey, you may see some differences in those values as interpreted from previous in this.

What you see here from a high level, people with disabilities were 42.1% employed and those without were 61.4% employed. I think it looks like we have just a slight typo. I apologize on that regard.

**Andrew Houtenville:** That's my fault.

**Nate Thomas:** I'm not looking to call anyone out, but just from a high level, that's really the largest difference. And that drives through for all of the other employment population ratios that you see here, is that it's a driving indicator of whether someone is employed or not is their disability status.

Then we also looked at just high-level percentage vaccination rate as differentiated by those various employment percentages. And again, you can just see just general high-level trend, total persons with disabilities 83%, without disability 86%. Large disparity for those that were not employed so that actually broadens for people with disabilities and without. People with disabilities being 82% vaccinated versus 87%.

But those ... with an unemployed work status. Following this slide, we are going to be looking at the relative likelihood of being vaccinated between workers with and without disabilities by work setting. And this is a relative likelihood. If it's equal to one, then the workers with and without disabilities have the same likelihood of being vaccinated.

So effectively we're taking two percentages, two proportions, making a ratio out of them and the further away that ratio is from one, the more different those two proportions are. So we're going to take a look at that from a very high level. Obviously, there's a lot of work settings listed here on the slide.

But the most different, and that point is actually driven home by the confidence interval that's displayed in the black line, is the United States Postal Service work setting with a relative likelihood of 0.645 and so we're going to kind of dive ... Workers with disabilities working in the US Postal Service were only about half vaccinated.

Whereas workers without disabilities working in that same setting were 77% vaccinated with that relative likelihood that we noted in the previous chart. This effectively means that US Postal Service workers with disabilities were just simply less likely to be vaccinated than those without disabilities. So it's an interesting finding and one that I think bears further investigation.

We want to make sure to be relatively rigorous about what we're investigating, looking at, and trying to dig into. We wanted to also look at workers with disabilities relative to workers at home. Effectively, workers at home, were typically had a typical higher vaccination rate than others. As a relative gauge of a highly vaccinated proportion, it was a good independent set.

Again, we're going to be looking at that relative likelihood, that ratio of the two proportions. And again, just, I guess, kind of further driving that point home, right? That the United States Postal Service work setting was only 0.543. I guess, relative likely to workers at home for being vaccinated. Hold on a second.

There we go. So just to kind of summarize what we had seen without going, you know, line by line in each work setting, there were low vaccination rates were found in the United States Postal Service, other job deemed essential food and beverage stores, correctional facilities, agriculture. I have to move the zoom subtitles here, I apologize, and non-essential workers, there is an interactive dashboard.

We took screenshots here just for demonstration. And this shows effectively all of our results. And it is split at the national level, at state level, at the categories we analyzed within racial group. It is relatively comprehensive. I used that term...

**Andrew Houtenville:** It's good. It's comprehensive.

**Nate Thomas:** It is relatively comprehensive. I think that we did a very good job of splitting, on a very wide range of different demographic types, where there was age group, disability status, et cetera.

**Andrew Houtenville:** It also has vaccine hesitancy, doesn't it?

**Nate Thomas:** It does, yes. In further diving in, it also incorporates whether someone responded with certain hesitancy questions within the survey. So you can see not only who wasn't vaccinated, but also why they chose to not be vaccinated as well.

**Andrew Houtenville:** So do you remember whether postal service are more likely to be the distrust of government

**Nate Thomas:** Oh, I don't remember offhand, but if we have time as I stacked the slides, I can certainly jump in and take a look. That's an excellent question, but one that is available to be answered on our dashboard.

**Andrew Houtenville:** Yeah, just one thing for the audience. This is really a beta version and we've been very reticent over the years because of accessibility issues with a lot of these big fancy data visualization software, we're dipping our toes into that because it's advanced enough such that accessibility is more likely to be guaranteed. We're just starting off with this website as one of our examples of how we're approaching more interactive as opposed to just having big, massive pdfs take it away Nate, sorry.

**Nate Thomas:** No, absolutely jump in and provide additional info. Some of the ways that we're doing our due diligence to try and ensure that any researcher has access to this information is any chart that we've included in the dashboard is immediately followed with a HTML table that has all of the same information that was contained in the chart above. Any reason the chart isn't accessible to a particular individual who's interested.

Information is carried below in a table as well. And just points of discussion. Our hope and intent with this is that we can continue to guide vaccine distribution regardless of whether it's Covid 19 or other vaccines.

Because there is such disparity within work setting and demographics. Looking into those particular respondents who had responded that they were willing to wait and see, could actually provide an ability to almost targets susceptible people to a vaccine within those intersections. Looking at those people who were only hesitant because they weren't sure as opposed to a heels dug in type scenario.

Again, just from a high level, there are significant disparities observed within work setting. This data that we're presenting here, as well as the panoply of what we've done up to this point, does help inform effective strategies in the future. And we hope that there can be continued research into those barriers of why and workplace best practices. Some future work that we've noted, this is certainly not comprehensive.

These are just ideas that we've been ruminating on internally that we think could also be of help. There is high correlation between what we're describing here is distrustful hesitancy reasons and that's that they don't trust the government and they don't trust Covid 19 vaccines.

It's very common that if someone responded that they didn't want the vaccine for one of these reasons, they also were likely to respond they didn't want it for that other reason as well.

**Andrew Houtenville:** They did not ask I do not trust pharmaceutical companies.

**Nate Thomas:** They did not.

**Andrew Houtenville:** Which would be the other reason

**Nate Thomas:** Yeah. Yeah. Then diagram of the three. I would imagine that overlap is large of the three categories of distrust potentially. And then we also think it would be very interesting to look at what those demographic compositions are, workers with disabilities within US Postal Service, particularly to extract out maybe some of those indications of why there was such a low vaccination rate.

This is the reference that I talked about above. Again, Andrew, I'm sure you're familiar. Thank you so much. I will stop sharing there. Are there any questions, comments, suggestions?

**Andrew Houtenville:** I'm going to share the Q and A so you can ask Q and A in the Q and A box. And typically what I'll do Nate is I'll go through them once I get my screen shared properly.

**John O'Neill:** Andrew, I have a question to start with.

**Andrew Houtenville:** Sure, go for it John.

**John O'Neill:** I was wondering whether Nate, you all had an opportunity to look at issues around vaccination and intersectionality between race and disability. Race, ethnicity and disability.

**Nate Thomas:** For this particular study, we didn't intersect both race and disability status. That is absolutely work that would be beneficial, I think. One of the, as I'm sure you know, one of the drawbacks of splitting on various demographic groups, especially because we are also interested in splitting on state, is sample size considerations.

But at a national level, making those estimates within those intersections of race and disability, I think would be very helpful. It wasn't endeavored for this particular project though.

**John O'Neill:** Thank you.

**Andrew Houtenville:** Yeah. We did a lot of things around pooling the various fieldings that, they call them weeks, but they're two-week periods. And I think we just run into this sample size issue that we typically do. Let me see if I can finally share my screen. Okay. So there's Q and A. We also have a survey that you can take for giving us feedback back.

So back to you Nate. Let's take a look at the questions that we have going. Anonymous attendee, oh that's referring to something else. If we're going to be; anonymous attendee asked three questions, unless there are more than one of them, you got to give us your name. No way. Anonymous attendee asked early on, sorry this is back to the original numbers whether there was any change in the prevalence of disability. Let me put my video back on.

You guys almost caught me with my reading glasses. Anonymous attendee asked if there's any prevalence change during the pandemic. And I think as I recall, I haven't looked at the results in a while. I looked at compositional changes. Whether compositional changes in the population with disabilities was driving the rise, we've seen in both labor force participation and employment-to-population ratio. And my early results showed that it really wasn't the composition that was changing.

The one prevalence indicator, the one group is cognitive difficulty, seem to have increased the most. My concern was that that's actually long covid. Aftereffects of covid were mild cognitive decline, some serious cognitive declines. But if it may boost the employment rate, if those individuals are now reporting disability and they're more likely to be employed.

But it doesn't seem to be the case the last time I checked, in terms of the literature, I don't think anybody else is really, I know that Ari at Harvard has been looking into it, but I don't remember his results. I don't recall was showing anything. It's been a while since I've looked at his work. ... position two period, he was using a matching ability and looking at more of a severity measure.

But by all intents and purposes so far, the increase that we've seen isn't really related to that basic compositional changes. So what does ... say, has there been any research done around the possibly adverse effects of vaccine or how safe it is? Nate, do you know anything about that?

**Nate Thomas:** I guess as much as a typical participant in the current society in which we live, it wasn't focused particularly in terms of its efficacy and safety. In terms of what we reviewed,

**Andrew Houtenville:** I don't think the PULSE doesn't have any. And I'm not aware of any other survey data that suggests that vaccines. What I really want to see is long term follow up to the people who were in the clinical trials.

So at least you would have, and that's not my field, you know, I don't do experimental design and, you know, I don't know whether those studies were designed to do long term follow up. A lot of times it takes a lot of money to follow people over time because they move, and they get disconnected from the experiment.

And long term follow-up has to be done really carefully because you can have differential attrition, you know. But that's where I would look if I was going to see if there are any adverse effects of the vaccines.

**Nate Thomas:** Agreed. And then because of that differential attrition, you can see survival bias in results.

**Andrew Houtenville:** Yeah, that's right. So differential attrition could be people who pass away. And if that's related to the vaccine, it's going to be selected. It's selection bias or confounding by indication kind of thing or other fields. And yeah.

**Nate Thomas:** There was one quick question. I just wanted to jump in, if you don't mind, just go back. One question. The question was around other literature and a literature review. We have looked into that from high level.

A lot of analysis was done either within work setting or within demographic. Our here specifically wanted to focus on that intersection of the two. As the previous question also outlines, it would be even interesting to then further intersect some of those and we'd be interested in doing that. There is a paper out by woman named Andrea Steege. I believe it's S T E E G E. She's published on similar results but without the intersections that we've outlined here.

**Andrew Houtenville:** One thing to note, this is a new dimension for the nTIDE audience and for us at nTIDE. The idea of occupational safety and health. The Institute on Disability at UNH has been doing work in that area led by Karla Armenti. Nate and I's colleague. Our colleague, the idea of disability being a demographic category is really not well understood among ...

It's understood, it hasn't propagated itself as much as you might think. Because NIOSH, and occupational safety and health epidemiologists and clinicians focus a lot on vulnerable populations. We have a project, Nate and I, funded by NIOSH to basically make the case, if it's there, to investigate and make the case whether people with disabilities follow, fall alongside the other vulnerable populations that NIOSH looks at.

What they mean by vulnerable populations is not necessarily populations that are dangerous work. Certainly that matters. But populations that may be susceptible to doing things at work. If you're low wage, a low wage, vulnerable population, you may be more likely to fall victim to inappropriate requests at work to do dangerous things. Or the idea of a vulnerable worker really goes at, not industry, but where you're coming from culturally and economically.

We thought it would be a good idea to make the case that people with disabilities aren't just. Disability is not just something to be avoided. People with disabilities are a demographic category. We're using the same data, we're using the current Population Survey, they use the NIOSH uses the Current Population Survey.

They have a connection to BLS, and they generate a lot of these vulnerable population statistics by state and region, and industry, and occupation. You should see this massive dataset. They only provide standard errors for one thing, for those who are familiar with the CPS, it's the monthly survey is very difficult to standard errors.

And we've developed a process just relative to the standard approach, that is really difficult to employ for a variety of reasons. We're going to provide standard errors for all these things. You'll notice in Nate’s presentation, a lot of the error bars, those were the lines, they crossed, they crossed over once So we weren't able to say that it's statistically different from one.

Yeah. Anonymous attendee asks like, underage workers who can say no. Immigrant workers, especially those who are illegal, they can't say no. And I would add seasonal migrant workers that work their way up the East coast, at least I'm sure there's the same in the West coast. Migrant workers, temporary workers that are very susceptible to being asked to do certain things.

**Elaine Katz:** Andrew, I just wanted to add that a number of years ago there was an issue with forklift operators who are seen as their jobs can be dangerous and warehouse and not letting people with disabilities, for example, who are deaf, ride those forklifts, until it was proven that they are not a danger in that environment.

And the famous story that's told, somebody said, how would you know, if you're a deaf driver of a forklift, how would you let other people know you're there? And the guy said, I beep my horn and people jump. But I think your question of whether or not a vulnerable population that time they were seen as a vulnerable population, a warehouse, you could not have a job that was considered somewhat dangerous because there are a lot of accidents with forklift drivers and hauling equipment in a warehouse. That might be an example of what you may want to look at.

**Andrew Houtenville:** Certainly NIOSH work really wants to look very much at industry occupation. This idea of essential work setting, this conglomerate measure doesn't fit well within the vaccine world and within the emergency covid really exposed us to. NIOSH very much sticks to occupation and industry, so something like that is right.

That's exactly right. We would want to focus on very specific occupations and specific disability types that might interact with the occupational requirements or industry standards or industry environment. That's why UNH has been working. We haven't done it, we haven't kick started that again. But using the American Community Survey, I think once we convince that, convince the field that people with disabilities are a vulnerable population, if that's true, we're going to take a look that doesn't necessarily have to be the case.

That's worth paying attention to people with disabilities in this context. The next would be to use the American Community Survey, a different survey which has such a big sample that you can do the intersectional things that John mentioned. I would be really excited to start doing that work. It doesn't give us the monthly stuff or the biweekly stuff every two week. Stuff that data that PULSE gave.

For those interested PULSE is an experimental dataset and has been really. These phases, they just limp along and get additional money. And other agencies like NIOSH will use those data. I think we got another anonymous. Yes, long years of migrant work along the West Coast. Long history.

**Elaine Katz:** Let me ask you another question, Andrew. So if you have a worker who's in a position like a Greeter at Walmart who has intellectual disabilities. Is that considered a vulnerable worker if they always keep that person in that position and will not give any consideration to promotion even though they may have the capabilities to do that?

**Andrew Houtenville:** Yeah, so what you're describing is as an individual with an intellectual disability, they may be considered a vulnerable worker. And then the impact of being that vulnerable worker is not being able to move around in the company. Now whether that would be a safety and health issue, I don't know you. My guess is greeters, we were, greeters were

**Elaine Katz:** Well, it was a safety and health issue. Because at some points those greeters were collecting shopping carts in a parking lot, and they were put into some dangerous situations. And dangerous weather where ... they may not send other people.

**Andrew Houtenville:** Yeah, that's right. My son almost got frostbite in his nostrils when he was, he was 15, you know. So we got him a little work permit so he could work early. And his boss sent him out at like, you know, two below temperature, 18 below wind chill and you know, so as a young kid, he was vulnerable to that.

And really, like he could say no, and he quit the next day. And, you know, it really affected his ... Anonymous attendee says, interesting differences between the USPS and other employees. Any investigation into occupational sectors, government workers versus nonprofit sector. I don't recall. Does PULSE ask about sector or what's called class of workers, sometimes government.

**Nate Thomas:** I'd have to look back at the data dictionary. I don't think that. I do know that after week 48, which was effectively the end of 2022 for the PULSE release, they redeveloped the work setting value such that it actually just follows industry codes.

So that's a standard industry code set. ... makes that that is included. So it would be in the PULSE survey going forward, but just because it had changed so dramatically at that week value, there isn't any across time sort of comparisons, unfortunately.

**Andrew Houtenville:** Yeah. Yeah, that's right. Because it's an experimental survey, it gets all these changes, right? It makes a difference ... things in pool samples together that you would need. We picked the year that the involvement we did.

We in some sense wanted vaccines to stabilize because if there's different trends for different groups at the point we discussed, they were pretty well rolled out. We can look into sector just looking outside the workforce and the workplace when PULSE just was amazing tool during the pandemic. And we have some papers that we wrote out of it that are published, I think.

Shreya [Paul] and I have a vaccine paper, have an employment paper. Really what we were struck, I was struck by, when you looked at who was the most likely to be vaccine hesitant, it was, there was a lot related to education, educational attainment. There was also, veterans. Veterans were highly vaccine resistant, hesitant, and their spouses were highly.

And, you know, a lot of veterans get jobs in the US Postal Service, so that may be a connection. So there may be interactions of, of background and occupation, or occupational setting, or work setting. It could be certain groups in a setting that are more vulnerable. And certainly a group like NIOSH which is aligned with the CDC. It's not in the CDC, but it's aligned with the CDC, right? Has a big interest in a pandemic, 18, 19, 18, so in 100 years, hopefully longer.

When there's another pandemic, there may be some good lessons learned. And or big flu outbreaks certainly kill a lot of people. All right. Any other questions folks have? Nate, any final comments? It looks like we're closing up.

**Nate Thomas:** The only thing that there was a previous question around, potentially migrant workers and younger workers as well. One of the interesting findings that we did find was that young workers, so age 18 to 20 in agricultural or forestry fishing settings were one of the least vaccinated groups.

Just when looking at all those variety of vulnerabilities, even this particular indication of wellness, whether someone was vaccinated or not and then, you know, was subsequently protected from Covid 19. This as an indication just shows further vulnerabilities of that subset as well.

**Elaine Katz:** Although, Nate would you say, because they're primarily outdoor activities and work outdoors that might have contributed to not being vaccinated?

**Nate Thomas:** Yeah, they very well may have. Absolutely. That's Yeah. An excellent observation and could account for that just because of the outdoor a consideration and viewing that as a mitigating factor.

**Andrew Houtenville:** And their age. You know, their age and their outdoor factor. And then they may be in more rural areas which had lower vaccination rates. Anonymous attendee has conversations with peers who are veterans and interesting, interesting observation that they had been already exposed to so many vaccines while serving in the military.

That could draw hesitancy similar to the experiences of the African American population with clinical science, clinical testing, experimentation, that there could be real sources of distrust. Distrust for the government, and distrust for vaccines could really be informed by past experiences, not necessarily random.

Interesting the veterans, the exposure of veterans to previous vaccines. Access to vaccines. Access to vaccines. So yeah that, access to vaccines was a very very very frustrating thing during the pandemic. Data on access to vaccines. The PULSE survey asked about hesitancy, but it really didn't ask about constraints.

They asked a question about cost, concerns about costs. But they really didn't delve into lack of information, lack of transportation. I thought they could do a better job. Instead of couching hesitancy couching things, couching a bunch of hesitancy questions with access questions I thought was not a good strategy that access should have been, you know could have been primed with its own stemming questions.

Things like, have you tried to get a vaccine and failed. We did a survey and a series of focus groups in New Hampshire around caregivers and people with disabilities. What we found especially was evident in the focus groups, but also alluded to in the survey results, which we did after the focus groups that access to vaccines really dried up.

There was this huge public outpouring and I remember anecdotally myself, an outpouring of community to help people get the appointments online. People were asking for access, they would book a bunch of things and call up people to book appointments for them. And there was this really unbelievable feeling. I remember being in line for my first vaccine.

And then it started to sour as more doubts, rightfully or wrongfully, started to be put forth about vaccines and started to dwindle. And they were afraid to ask help because it became such a lightning rod issue. People, instead, they may have lost their supports because their support was vaccine hesitant.

Then they were afraid to talk about vaccines and ask about vaccination because it became such a lightning rod. And we're talking the fall when the boosters first started to be discussed in the fall of 2021. Was it 2021? Yes, 2021. It became a real issue for both, provide- informal caregivers, and for people with disabilities, just the communication barrier. And I don't think the PULSE, I'm almost certain the PULSE didn't ask about kind of, you know, hesitation about communicating, about asking for help or, or things like that.

**John O'Neill:** It's interesting that the last comment we got sort of supports what we were thinking of, around access, something very simple. People didn't have the spare time,

**Andrew Houtenville:** Yeah anonymous attendee brought that up. Yeah, I mean, certainly vulnerable populations if I think of the overlap of vulnerable populations with those who work 2 - 3 jobs and just coordinating care, coordinating family and work was a reason to put it off. I'm an example of it. I didn't get my third booster. Second or third booster? Third.

I got Covid last November and I was busy. I think time is really meaningful. It's too bad. We can't, like Election Day, get everybody vaccinated. Not everybody has an employer that's willing to accommodate ... the vulnerable populations is similar. Do you have resources and supports and willing employer, all those things play in. It'll be really interesting. We're coming to a close. It'll be interesting to do the vaccine things.

For me, the concept of vulnerable population is something that I'll take away from it. Because if we think about employer practices and UNH and Kessler have been really looking at accommodation policy and employer practices. That one thing you know, for employers to have a practice is one thing.

But does the employee know it's available? Right, accommodations are available. Are they willing to ask about them? And if they're from a vulnerable population, they may not have experience and/or kind of, they may have, you know, fear about asking for, say, a job modification or a technical accommodation or, you know, flexible work hours.

Covid really changed, what we found in the 2022 survey was that Covid really changed. It really exposed a lot of employers and workers to the idea of requesting accommodations. And that's a real big positive. However, vulnerable populations, just like vaccination hesitancy, there could be hesitancy in taking advantage of workplace accommodation processes.

So that could be an interesting work or survey. I don't remember the 2015 survey, if we got into it during the accommodations question, about fear of accommodation. I know there's fear around disclosure, which would be the first step in the accommodation process. But it's fascinating to think about not just workers with disabilities, but the intersectionality with other vulnerable populations as well.

Any other comments? Anybody? Yeah, so choice. Anonymous attendee, I'll just put on my plug. Economists often talk about, I'm an economist by training and we often talk about choice. Anonymous attendee says the luxury of having choice. Choice, it's always constrained choice. Prices, income, information constrain, and ability, person's ability to make choices.

And while we may say the word choice, it's always going to be things and choice very few things are free. Okay. I'll stop there. Thank you, Nate. Thank you, John and Elaine. Thank you Anonymous attendee, and others. Liu and everybody else on the call thank you. Okay. Bye bye everybody. Have a good weekend.