Hello! Thank you so much for joining us today. Wonderful to see some familiar faces. Fantastic. Looks like we've got people just starting to come in. Wonderful. We will get started in just one moment. Hello, everyone who's just joining us. Welcome, welcome. I always love this part of the webinar because I get to see so many familiar names popping in. Hello! Thank you so much for being here.

All right, fantastic. Well, I will go ahead and get us started, as we have more people coming in. So, hello officially! And welcome. We are absolutely delighted to have you join us today. This webinar will be recorded, and the recording and slides will be sent to you via e-mail sometime after the webinar. During these live presentations, please do excuse cameos from canine colleagues and other unexpected moments. And, of course, we hope this doesn't happen, but if the webinar were to close unexpectedly, please do reopen it from the link that you used to attend this presentation. We of course welcome your questions. We will address them during the Q&A session after the presentation of slides is done. Please type in your questions at any time, using the Q&A box, which is on the bottom of your Zoom window. And if there are verbal clarifications or participation that is necessary, where you need to use your audio, please click on the hand icon, which is again at the bottom of your Zoom window. That will raise your hand, which lets us know that you would like to speak. And someone here will unmute you. And a prompt may appear that will ask you to unmute yourself. This action will temporarily turn on your microphone so that you can ask your question. You don't have to remember all that. We'll repeat it in a bit. A live transcript is available. To show or hide that transcript, click the up arrow next to the live transcript button that is also, again, at the bottom of your Zoom window. And please note that for those who are viewing on a phone or tablet, the Zoom app currently only highlights the active speaker. The live transcript will still be available. And you may need to scroll left or right to see the presenter or the presentation. For privacy during the presentation, all participants are in listen-only mode, with microphones muted, and chat between participants is unavailable. Again, we will work with participants as needed to turn on microphones during the Q&A session. And one last note, if you are posting to social media about what you learn here, please tag us and use the hashtags that will appear momentarily in the chat. And once again, this webinar will be recorded, and the recording will be sent via e-mail.

And now, I am delighted to introduce you to Robyn Rontal, who will moderate this webinar and will assist Elham with any questions or comments. Robyn is co-PI and project manager for the RRTC. She leads the Center for Healthcare Research and Transformation policy analytics and consulting projects. So, that's CHRT, for those who know it better that way. Robyn has over 30 years of experience working with
various stakeholders across the healthcare marketplace, providers, insurers, consumers, and policy makers. With that, Robyn, the floor is yours.

>> ROBYN RONTAL: Thank you so much, Annalee, and welcome this afternoon to all of our participants. I would like to start by introducing our RRTC to you, the IDEAL RRTC, which stands for Investigating Disability factors and promoting Environmental Access for healthy Living RRTC. The over-arching goal of the IDEAL is to promote the healthy aging of adults with long-term physical impairments and disabilities. We are achieving this by identifying factors at the intersection of the person and environment, that impede or support positive health and function outcomes, and we are also creating solutions that improve the fit between supporting positive health and function outcomes. Our IDEAL RRTC contributes to the understanding of successful aging with disability by investigating the interplay between individual factors and social and environmental barriers and facilitators, as they hinder or promote healthy aging and community participation. We conduct various research activities to promote the healthy aging of adults with long-term physical disabilities, and this webinar highlights one of our key research studies.

Elham Mahmoudi, who will be our presenter and is the primary researcher on this project, joined the Department of Family Medicine at the University of Michigan as an Assistant Professor in 2017. She earned her PhD from Wayne State University here in Michigan, in economics, in 2012, and subsequently finished her post-doc research at the University of Michigan. Dr. Mahmoudi is a health economist with expertise in large data analysis and methodologies. Her research interests include evaluating healthcare policies, reducing disparities, and access to quality healthcare, and optimizing care management for patients with multiple chronic conditions and those with Alzheimer's disease and related dementia.

I'd like to provide a brief summary of the webinar, and then I'll pass the baton to Elham. This webinar is focused on research that Elham has been conducting on adults with pediatric onset cerebral palsy and spina bifida, or acquired disabilities, including spinal cord injury and multiple sclerosis, and these individuals are more likely than those without disability to develop medical complications. Prior to this research, little has been known about the potentially preventable hospitalizations among adults with disabilities. These hospitalizations are preventable if patients have timely access to care.

The objective of this study was to examine the potential risk and protective factors for preventable hospitalizations, comparing adults with these disabilities to people without. Our results indicate that adults with disabilities are at greater odds for preventable hospitalizations compared to people without disabilities. Our findings include that the use of preventive services such as annual wellness visits, had substantial protective association against potentially preventable hospitalizations. And with that, I would like to introduce Elham.

>> ELHAM MAHOUDI: Thank you so much, Robyn, for the introduction. Without further ado, let me share my screen and start the presentation.

Do you see the screen?

>> ANNALEE SHELTON: We do see your screen, it looks great.

>> ELHAM MAHOUDI: Great, thank you. Let me start. I'm Elham. Good afternoon. It's a pleasure to be here, though I would have preferred to have it face-to-face, but here we go. As an
acknowledgement, as Robyn mentioned, this research has been funded by NIDILRR, the National Institute on Disability, Independent Living, and Rehabilitation Research.

I’d like to acknowledge my co-investigators. Mark and I were co-Directors for this section of the project. And I would like to thank soon-to-be Doctor, Khan, Dr. Kamdar, and Dr. Lin, for their extra ordinary work on these projects. I’m piecing three manuscripts together for these presentations and these three individuals, it’s a teamwork, and I’m just basically presenting our teamwork today.

I have no conflicts of interest to disclose except for the fact that I am an economist, I have an extremely dry sense of humor, so I... ask your forgiveness for no animation, no cool graphs or figures here, bunch of numbers, but the topic is interesting, I believe.

So, the agenda for today’s talk. I will go very briefly introducing claims data because we use claims data for analysis of this type of studies. And I will go briefly over the backgrounds of these three conditions that we cover, study aims, data methods, results, and policy implications. I have to go very fast, so if you have questions, please put them in the chat. Or e-mail me directly. My e-mail is at the very beginning. I believe you already got my e-mail address. If you have a question that we don’t have time to address during the session, feel free to e-mail me at any time.

So, to briefly cover what are administrative claims data, basically they’re not developed. administrative claims data have not been created for research purposes. They are for billable services throughout healthcare systems. And there are three parties involved in each claim record.

First, patient will go see the physician or hospital, any type of provider, to receive healthcare needs. The provider needs to be reimbursed for the services provided. So that provider gets reimbursed and will contact the payer or insurance company. This whole transaction will be recorded in the claims data and that’s basically the content of it. So claims data cover all billable or payable healthcare encounters, whether it’s the office visit or inpatient hospitalization, ambulance services, or prescription drugs. Anything billable through your health insurance will be recorded in the administrative claims data. To provide some examples, CMS is a claim-based database that basically administrative Medicare and Medicaid data. Optum Insight is an example of private insurance claims data.

Just to give you an overview -- and we have done this before -- there are some similarities and differences between them. Medicare claims data specifically covers services for adults 65 and older and people with disabilities. OptumInsight and Truven MarketScan are private insurance covering individuals of all ages. Those who are 65 and over are those covered through Medicare Managed Care, not fee for service.

As a social scientist, I’m very much interested in Medicare claims data just because it gives me more options to merge claims data, that do not include social determinants of health or any type of socioeconomic variables with claims data. Medicare and Medicaid claims data provide more information so we can enrich them with data from various sources such as ZIP codes and actually merge that data with our claims data. Those options are much more limited in OptumInsight and Truven MarketScan because they provide only the 5-digit ZIP code and there are some restrictions on how to merge the data with other datasets. And MarketScan doesn't provide it at all. It's at the state level.
So, to summarize, commercial insurance, or that's what we are using in this set of studies, we use OptumInsight, include basically inpatient/outpatient prescription drugs. You can identify if the provider was primary physician or a specialist, the place that the service occurs, is it outpatient or inpatient, and prescription drugs. If you want to think of claims data you can think of any type of rational database. That's basically a definition of claims data. It contains various tables that are linked together based on unique patient ID or enrollees ID. Each claims data contain a file called enrollment. In Medicare files for example they call it master beneficiary summary file. You will find some demographic information about the enrollees, such as age, sex, date of enrollment, and the beginning date and end date, if it's been ended. And there are other examples. We have medical claims data that include basically all transactions that happen. Again, inpatient or outpatient.

To define those transactions, we need to talk the language that has been talked in medical claims, meaning either using ICD 9 or ICD 10 codes to define the diagnoses, or using CPT codes to define the procedures. Either CPT or American medical association CPT codes. Using those, we can define our cohorts or procedures that have been performed. We can also, as I mentioned, define the facility. Either it's inpatient or outpatient. And provider type. Prescription drugs.

Lab results, I've never used in any claims data and based on my understanding they are not reliable. We've not use td them in this study. So, this is again an example. We provided this previously in our previous ICPSR presentations. Just to give you an example, as you see, there are here patient IDs. We have beginning date and end date, gender or sex, and other demographic information here.

We do have diagnostic and procedure codes to identify our patient cohort and services that they have performed. One thing that's also important using claims data, and that's their positive point, is either charges or cost. We do have charges, but I do have to warn you that charges are not equal to costs. We usually measure cost by the amount reimbursed. They're both available in claims data. So, we have the total charges. We can also measure out-of-pocket cost, by summing up the copay and deductible. And we do have the standardized cost that is the cost that was reimbursed based on the CPT code that is provided for each service. And usually there are several lines for each service that's provided. So, if you're looking at the specific procedure, you can sum up those specific service lines to come up with the total reimbursement amount. Again, in this study we did not look at cost. What we measured was potentially preventable hospitalizations, which I will explain briefly later.

So, that was the summary. That was the first part of the talk, summary about the claims data, and how we can use it for health services research purposes.

Now, for this specific study, we were looking at three sets of disability -- congenital or pediatric onset disabilities and acquired disabilities. So, the first thing based on what I described, the first step is using the ICB9 codes to define our patient cohort. We looked at individuals 18 and older. Then we made sure that they have at least -- because that's a longitudinal analysis, we made sure that they have at least four years of continuous enrollment. So, we can measure the outcome variables that we were interested. For pediatric onset conditions -- cerebral palsy and spina bifida, the index state is actually a fictitious date. Because these conditions happen at the time, so we are not measuring incident.
It's the prevalence we notice in the claims data because we are looking at adults with these conditions. But with the final cohort, we set our index based on the first date of diagnosis. We use a one-year lookback period to measure all chronic conditions to risk adjust this patient cohort when we are comparing them with our control group. And for congenital conditions, we make sure we have at least three years of continuous follow-up to measure our outcome variables.

Similarly, we have the same thing for acquired condition, people with diagnosis of multiple sclerosis and traumatic spinal cord injury. In that case, the index event is the actual one based on the first diagnosis of the condition throughout the enrollment period. Again, the use of one-year lookback period to define chronic conditions and four years of follow-up to measure outcome variables over time. So, just a brief background. What are these conditions? Again, here I'm an imposter as an economist not a physician. But just to give you an overview about these conditions, cerebral palsy and spina bifida are pediatric onset conditions known to cause an array of permanent movement disorders. The incident rate is about 2.5 per one thousand births for CP and 1 in 3 thousand for spina bifida. And life expectancy is increasing tremendously over the past two decades.

Therefore, the research that has been more focused among the pediatric cohorts needs to move up to adult cohort. Because these are the people who usually we don't have health centers for them, the care is not coordinated, and that's why it's important to include them in this study. Multiple sclerosis is a chronic inflammatory disease of the central nervous system typically diagnosed between the ages of 20 and 40 and it's a neural inflammatory condition and it's permanent. It's a chronic condition, which gets worse over time. Traumatic spinal cord injury, mostly caused by motor vehicle accidents, falls, or acts of violence, and usually cause permanent disability.

Now, working with claims data again. The main important thing is to define your cohort accurately and completely. So, I remember when we were conducting this analysis, we spent months to make sure our ICD9 codes, which we use because we want to make sure we have four years of follow-up for this patient cohort. So, we didn't need to use ICD10 codes, which were introduced in October of 2015. Even now when I go back, there are things that I wish were included that we didn't include at the time. So, spend as much time needed to find your cohort using ICD codes for diagnosis. Potentially preventable hospitalization. I want to spend a few minutes to explain what they are. They are based on prevention quality indicators, which were developed by the Agency for Healthcare Research and Quality.

Why do we call them quality indicators? Because these conditions are conditions that could have been -- the hospitalization for them could have been preventable, if patient had sufficient access to care. They are used as quality measures, basically, to evaluate quality of primary care or physician service for instance, a good example would be a urinary tract infection. This is something that can easily be addressed through an office visit. Patients do not need to be hospitalized. It's not efficient. They are using resources that are not needed. If patient has timely access to a physician. That's why they are very important. They measure every year. The Agency for Healthcare Research and Quality tracks these services over time.

So, these are ten PQIs I would mention. Again, as I mentioned, going back to my explanation for
claims data, for each of these we have a set of ICD9 or 10 codes that identify hospitalizations for these conditions. They did have to look at all 10PQIs for our patient population. This is just an example for the first one, which covers diabetes short-term complications. I provided the 9 and 10 codes here in this table. And there is a set of exclusion criteria which is important.

And for that I just need to thank Dr. Kahn and Dr. Lin because it's extremely hard.

There are ten conditions. You have to check your claims data to ensure that your inclusion or exclusion criteria for that one binary variable that you create to define PQI-1 is accurate.

For those of you who are interested, a complete list is provided. I have it in a footnote in the website and you can access those. For instance, it's could have been in our cohort actually, those who are pregnant should be excluded. This is an example. This is again another example. All of these manuscripts have been submitted. When they came they're in the supplement file. But, again, for those of you who are interested, these information are provided in the website. There are additional exclusion criteria, but the specific codes mentioned for each of these ten PQIs should be followed.

So, why is it important, the rationale for conducting this study? Why are we interested in potentially preventable hospitalization among people with disability? We know, through our own work and work of others, that prevalence and incident rates of comorbid conditions, cardio metabolic, psychological, musculoskeletal, and other conditions, are higher among adults with CP or spina bifida, MS, or those with traumatic spinal cord injury in Mary, compared to those adults without disabilities. And compared to the population in general because most of these people lack regular mobility, access to care is much harder for them. They have more complex health needs. And therefore, are more prone to adverse health events.

On the other hand, we know that healthcare system in general is expensive. Right now, in the United States it's about 17.7% of our GDP goes to healthcare systems. Hospitalization is an expensive use of the healthcare system and should be avoided if there are other mechanisms to address the condition. Potentially preventable hospitalization is among one of them. So, the rationale for this study came from that. That's why it's important. How can we make the healthcare system more efficient, value-added, for this patient cohort that we know are at higher risk?

So, the main objective of this study was to examine, basically, the risk of potentially preventable hospitalization for this group of adults compared to adults without disability. And what we are after, who cares basically about that, is how we can address modifiable factors. If we know that certain PQIs, certain preventable hospitalizations, are higher among this patient cohort, maybe we can change the guidelines when they can see the doctors or use preventive services to address these adverse health events or potential unneeded hospitalizations among this patient cohort. So, this was the second part of the talk. Let me just check the time to make sure I am on time...

The third part of the talk, I'm delving into data and methods. Again, as I said, there are three papers. So, I will go over data and method, which was similar for all three studies, and then I will go to the results and policy implications for all of them. So, for this study we use often inside claims data for 2007 to 2017. Our patient population included adults 18 and over for continuous enrollment for at least four years or over, with diagnosis of CP, spina bifida, MS, and traumatic spinal cord injury, at any time...
during the study period. Outcome of interest was potentially preventable hospitalization. We had one composite measure of any PPH or any PQI during the four-year follow-up period. We also looked at each specific PQI, because that's of interest, which one is more common among this patient cohort. Demographics include age, sex, race, and ethnicity.

As I mentioned, there are three views based on SES, ZIP code, and date of death. We use SES specifically to have access to race and ethnicity and US Census data. Using the SES we also have access to net worth or net income and educational attainment of each enrollee. For health variables we use the one-year lookback period that I explained earlier to identify diagnosis of any cardio metabolic, psychological, and musculoskeletal condition. We also included cause of morbidity index, also introduced by arc, and instructions on how to calculate the Elixhauser index.

What else? We also used the diagnosis code that I did not explain. One thing that was of importance in this paper, in this study, was to see if use of preventable services -- preventive services, such as annual wellness visit, diabetes screening, cholesterol screening -- would have any association to reduce the risk of potentially preventable hospitalization. So, we use those time varying variables in our model to see their interaction with disability and their effect on potentially preventable hospitalization over the four-year time period.

So, these are our sample sizes for each group, about 10,000 for CP and spina bifida, 5,000 for spinal cord injury, and 6,000 for MS. We did match our cases for controls, those without disability based on age and sex. Because based on our own studies and work of others we know that as people age their health needs increase. Risk for PPH increases. Also, there are some studies showing that it's more common among females compared with males. So, to get those out of the way, we need to make sure we are comparing apples with apples. We match based on age and sex. But purposely let other chronic conditions, health conditions, play their role and see their effects in the model for increasing or decreasing the risk for PPH. Because it was a longitudinal study, we used multi-variable generalized linear model, applying binomial distribution and log link function, to address the repeated measure over time because we followed each patient four years to measure these things. We use generalized estimating equation.

And, oh, for the full PQI measure, any PQI, we used interaction terms. Our main exposure variable was the disability, either CP or SB, MS or TSCI, with all other important variables in the model such as sex, race, ethnicity, use of preventive services, and so on. We couldn't do that in our models for each PQI because of the small sample size. And then at the end of the odds ratio that we see is the result of adjusted marginal odds ratio based on our regression models. I just want to briefly explain here, if you are interested, when you run a non-linear model and you have interaction terms in your model, you cannot just use the coefficient of or odds ratio of the regression model because the standard error and therefore significance value is not correctly calculated.

If you are interested in this topic, you have to use the marginal outcome or adjusted predicted outcome for that variable. If you are interested, look up the work that has been done by Ed Norton on non-linear models. To just briefly explain, we use SAS for our calculations, so we used LSMEANS. If you're using STATA, you can use margin to predict the value for that coefficient, not the coefficient itself.
So, here are population size, unmatched and matched. We went through this before. So, here are the results for our CP and/or spina bifida, those with pediatric onset basically. As you can see in our unmatched group, ages for cases are slightly younger from our controlled group and there are more females than males, which was fixed when we had our matched group, there was no difference. And again, as you can see, between unmatched and matched cohorts, look at the rate of these chronic conditions. Like if you look at here, cases have substantially higher Elixhauser comorbidity, any psychological, any cardio, or any musculoskeletal conditions. This was expected. We knew this from our previous work. Crude rates of top PQIs for patients with spina bifida, UTI is among the highest. And as you can see there's a huge gap between cases and control.

And this is the end result, the adjusted odds ratio for any PPH, the composite measure, and the specific PQIs. As you can see, the risk for any PQIs is four times higher among patients with CP or spina bifida. Again, the high ones were bacterial pneumonia, at three times higher. UTI is about six times higher. And this is the first view for the use of preventive services. We interacted -- for instance, we look at the specific preventive services, and we interacted that with our exposure variable, which was the disability group. As you can see, for instance, conducting cholesterol screening every year would decrease the risk. We compare the cases. People with CP or spina bifida who has done cholesterol screening with cases that did not do the cholesterol screening. So, the screening itself decreased the risk for PPH. Bone density also decreased, but it didn't come out significant because it crossed the line. Annual wellness visit, definitely increased for everybody and among our cases. I do want to mention, because that's a repeated theme, as you can see, diabetes and PT/OT increasing the risk. And the reason needs to be explained. It's not like these screening tools, or health promoting services, I would call it bad or increase your risk.

It's because, based on current United States preventive guidelines, knots everybody's eligible to be screened for diabetes. Usually they do that for overweight or obese people. So, these are people who are already at risk. And PT/OT is expensive. They don't consider it as a health-promoting service, although literature has shown among people with disability, this is something that can help them to basically increase their functionality, or at least keep it ats the same level.

So that's why these two. And you will see that this is a repeated theme. Adults with traumatic spinal cord injury, almost the same thing. I'm not going through these numbers because they repeat themselves. The same theme.

As you can see again, the crude rates for top PQIs, substantial gap between cases and controls who are presented in this pinkish-peachy color.

Again, top PQIs as you can see urinary tract infection, pneumonia, heart failure, and COPD among this group.

And these are odds ratios. Again, any PQI. I will pick on the top ones, for instance, hypertension, people with traumatic spinal cord injury are at almost a four times higher risk to get hospitalized for hypertension and for urinary tract infection and for diabetes long-term complications.

Again, this is basically the influence of use of preventive -- I would call it preventive services, or
health-promoting services. As you can see, cholesterol screening decreased the risk for everybody. And people with traumatic spinal cord injury, bone density is in the right place but didn't come out significant. Annual wellness visit, among the three groups, for everyone and for people with disability, came out significant. And the same, again, theme for diabetes screening and PT/OT. And MS people are, again, very similar. Though they are not -- the difference, the gap is much smaller compared with other two groups, maybe because the disability is not as pronounced for people with TSCI or CP or spina bifida. But they still exist. Any PQI marginally significant is about 1.5, times higher among people with MS. And, um... urinary tract infection, definitely. About 4.9 times higher among this patient cohort. And bacterial pneumonia also came out significant among people with MS. And, again, this is the effective use of preventive services among this population. Cholesterol screening, bone density. Again, didn't come out significant. But annual wellness visit came out significant for everyone. And for those with MS compared with MS people who did not go for annual visit.

So, this is basically the summary. As we can see, in all three cases for MS people it was marginally significant. But having this set of disabilities increased the odds of potentially preventable hospitalization. Conclusion 2, use of preventive services, especially annual wellness visit, decreased the risk for PPH substantially. It basically cut it to half for all three groups. Compared with those with disability that didn't conduct -- didn't go for their annual visit. So, toll conclude basically, among all PQIs, urinary tract infection and pneumonia were the common PQIs that were people with disability in either of these three groups have higher risk to get admitted to hospitals for.

So, what should we do about it? And I'll go through the limitations before -- let me just stay right here. What can we do about it? I want you to think this is not just a study to show it was higher. Probably we would guess that because these people have more complex needs. What I didn't show here due to time limitation is the cost factor. Cost of hospitalization is 10-15 fold higher, even if it's just for one night, for PPH compared to an office visit. These conditions can be really addressed through office visits. So, the conclusion is, how can we increase and enable office visits or access to care for patient cohorts which is more efficient and can reduce PPH among them? And I will talk about it at the end. This is one of the projects that we are conducting through RRTC. We changed our medical procedure based on these findings to see the effect. In Michigan Medicine actually. To see how we can address these adverse health events among this patient cohort.

So, our studies are obviously not without limitations. Lack of variables. Indicative of timely access to healthcare. Like the density of primary care physicians in the area is an important one. Rigorous socioeconomic variables were lacking. These are basically limitations of claims data we are dealing with here. We also didn't have functionality index to determine the severity of the conditions. Obviously, you noticed the wide confidence intervals. It goes to the fact that not everyone with TSCI or MS or CP are basically the same. It's a heterogeneous group of people, individuals.

What else? The results are not representative of the United States. We used data from privately insured people with stable enrollment, which tells you about stability of income and probability of higher education. So, probably we are dealing with some potential selection bias that we cannot do anything
about. To address those actually we are using Medicare claims data which is for publicly insured individuals, and we hope we can address some of these limitations through that study. Policy implications. Although not all potentially preventable hospitalizations are avoidable, and we are completely aware of that, our results indicate that use of preventive service is associated with reducing risk of PPH. So, the point here, how can we incentivize providers and patients to use these preventive services more often?

Improve clinical accessibility to adult health centers. This is something we notice for adults with CP or spina bifida, when they cross the line from childhood, they enter into this fragmented healthcare system and it's hard to make an appointment and basically have access to care when needed. These are the things that need to – basically, the outcome should be the outcome of these set of studies.

I mentioned that we are using Medicare claims data right now to conduct the same set of analyses, basically comparing people with private insurance versus public insurance. This is ongoing.

And with that, I am done. I think I’m a bit over time. So, these are pictures -- I will make it quick -- from Ann Arbor. I hope at some point we can start having face-to-face meetings. I have two announcements before we start the Q&A: October 14th we have another presentation by Dan Whitney and Dr. Pervits (sp) and there is another one on January 13 about the importance of broadband for individuals with disabilities with Drs. Clarke and Rontal. With that said, I am done.

>> ROBYN RONTAL: Thank you very much, Elham. We really enjoyed your presentation. And there are several questions already in the Q&A. Before I start posing some of those questions to you, I just want to remind people to type any questions that you have in the Q&A box that's at the bottom of your Zoom window. And if you need to use your audio, please click on the hand icon, also at the bottom of the Zoom window, to raise the hand tool and let us know you’d like to speak. One of us will unmute you and prompt you to speak.

So, with that, I just wanted to start with a question for Elham. Can you talk about how the conditions were chosen that were part of this study?

>> ELHAM MAHOUDI: That’s a great question. For this specific project, when we were writing the proposal, we were looking at permanent or chronic disabilities. And we thought it would be inclusive to include both pediatric set, people who basically from the get-go, from the beginning were dealing with these disabilities, such as people with cerebral palsy, and then acquired condition such as MS and TSCI. They are two different conditions. MS is obviously developed -- it’s a condition that develops for some people, and TSCI is totally based on accident. So, as you can see, there is diversity and homology Nate among these conditions. We were using claims data and it’s easy to find this cohort of people instead of just using functionality as a disability, that we used previously with survey data.

>> ROBYN RONTAL: Thank you, Elham. Another question from a viewer who would like a little more information about the control group. How would people with other conditions that may be disabling handle with the control group? For an example, stroke, Parkinson’s, arthritis, amputation, et cetera.

>> ELHAM MAHOUDI: That’s a great, great question. And, actually, that’s a question that was raised by the reviewers when we were sending the manuscript for publication. For this set of studies we
decided to have a control group, people with either of these basically non-neurologically complex conductions. So, we excluded people with MS, spinal cord, and CP or spina bifida, from our control group. But we did not remove other conditions. We didn't look at Parkinson's or Alzheimer's for this specific study. They kind of represent basically population norm? That did not have this specific set of disabilities if you will.

>> ROBYN RONTAL: Thank you. I’m going to move to a question related to the data. When you examined cost data, did you include physician fees in your data? Physician fees would be part of the professional claims.

>> ELHAM MAHOUDI: Great question. We did not analyze cost data. Because when we were writing the manuscript, it was too much. We did analyze the cost data. And the way we measured it, we compared office visit, average office visit, any type of office visit, compared with average cost for potentially preventable hospitalizations. That data is available. We didn't put it in the manuscript, and I didn't present it here. But what I mentioned was based on that. To answer your question, yes, cost for physician is included as part of the cost. So, when you measure the cost, it is the facility cost, physician cost, lab orders cost. All of them combined together, to measure the average cost of office visit or hospitalization.

>> ROBYN RONTAL: Another question related to the claims data. Are there any other factors within the claims data, or data that can be linked to such data, that could account for barriers or facilitators to preventive health visits? Or could there be an interaction with the use of preventive health visits?

>> ELHAM MAHOUDI: Yes and no. Unfortunately, with Optum our hands were limited. We were using the ACS (sounds like) view and could not merge it with any other dataset. If you use Medicare claims data for this type of analysis, again, the answer is yes or no. We've done a similar study which is published in Family Medicine among everyone 65 and older for PPH. In that case we measured the data with area resource file, which gives you the density of primary care physicians and hospitals in the area, and 2010 Census data that gives you some SES variables. But if you're looking for -- there are some ways to measure, if you have the ZIP code address, others have used that. I haven't used that myself, but you can estimate the time to closest physician's office in your data using Medicare claims data. But often we don't have that option.

>> ROBYN RONTAL: Thank you.

>> ELHAM MAHOUDI: Oh, I'm sorry, just to add to that, there are studies which have done similar work and found out that risk of potentially preventable hospitalization, if the physician's distance is more than 30 minutes, increased. So, accessibility is definitely an issue that we couldn't address in our analysis, yes.

>> ROBYN RONTAL: Thank you. We have another question that's looking for a definition. Can you define the term that you used? And that term is functionality.

>> ELHAM MAHOUDI: Again, that's a great question. Depending on what condition you're talking about, using claims data, that was one of the limitations. For definition, I am not the best person to
address this question. I'll provide an example to say why. For instance, Dr. Meade and I conducted a study using the medical expenditure panel survey. Within that dataset there are variables that ask if you can perform certain things, like walking up the stairs, walking certain distance without help. And we combined all these variables and measures to come up with the definition of disparity for functionality, functional disability basically, based on those measures. Claims data, we did not have any of those. We are basically limited to ICD codes to define functionality. Just to add to that, if you are interested, there are people who have used frailty index. It's not exactly the same as functionality. but that's something that can be used as proxy using claims data.

>> ROBYN RONTAL: Thank you. One other question related to the characteristics of the population from Lisa, is what was the racial-ethnic and socioeconomic breakdown of the cohort?

>> ELHAM MAHOUDI: Great question. Again, due to time limitation I didn't have time to report those data. In our regression analysis, we did have racial-ethnic disparity data and some socioeconomic variables. And among everybody, not just people with disability. Risk of PPH was much higher among African-Americans, those with lower income and education. None of that is surprising because there are literature behind that. To answer your question, the distribution of race and ethnicity were almost similar to what we see nationwide. And we haft the control for being African-American, Hispanics, Whites, Asians. And also, we have enough sample to include those with missing or other race and ethnicity, we combined them into one group.

>> ROBYN RONTAL: There's also a question asking about what research shows about patient preferences. This is from Ernie. Do patients prefer to have more office individuals it's? And how does that relate to the risk of preventable hospital stays?

>> ELHAM MAHOUDI: This is an absolutely great question. I see mainly mixed method analysis, combination of qualitative and quantitative analysis. Great question. I don't know the answer to that. But it would be very interesting to study that. Just to mention, these are people with disabilities. I know for a fact from personal experience, going to the hospital is a shock to the system for many of these patients. It's hard. I'm assuming -- and I might be wrong -- that hospitalization is probably hard for these people. So, they may prefer an office visit. But to answer this question based on evidence, we need to do some qualitative analysis. Patient preferences, we cannot find them in any secondary data, not claims data, not survey data, unfortunately.

>> ROBYN RONTAL: Thank you so much, Elham, and all those who posed questions in the Q&A session. We are at the end of our webinar. And I do know that if you have follow-up questions, Elham and others would be happy to answer them and follow up with you outside of this webinar. And thank you again.

>> ELHAM MAHOUDI: Thank you all.

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