Good afternoon. I am Ibad, and I'm representing the COCA with the emergency communication branch at the CDC. I would like to welcome you to today's COCA call. All participants are in listen only mode. Closed captioning is available for today's webinar.

A transcript and video will be posted up to the COCA webpage shortly after today's session. Free continuing education is offered for this webinar. Instructions on how to earn continuing education will be provided at the end of this call. In compliance with continuing education requirements, CDC, or planners, our presenters, and their spouses/partners wish to disclose they have no financial interest or other relationships with the manufacturers of commercial products, suppliers of commercial services, or commercial supporters. Planners have reviewed content to ensure there is no bias.

This presentation will not include any discussion of the unlabeled use of a product or a product under investigational use. It CDC did not accept commercial support for this continuing education activity. At the conclusion of today's session, participants will be able to accomplish the following. Discussed methods used to review evidence of association between underlying conditions and severe COVID-19. Describe the risk associated with specific underlying conditions from the two cohort studies and studies using other methods.

And we will list the resources available for healthcare providers caring for patients with underlying medical conditions. After the COCA call, there will be a Q&A session. You may submit questions at any time during today's presentation. To ask a question using Zoom, click the Q&A button at the bottom of your screen and type the question in the Q&A box. Please note we receive many more questions than we can answer during our webinars.

If you are a patient, please refer your questions to your healthcare provider. If you are a member of the media, please contact CDC media relations at 404-639-286 or send an e-mail. Now it is my pleasure to welcome our presenters for today's COCA call. We are pleased to have with us Dr. Sapna Bamrah Morris.

Dr. Morris is the clinical disease team lead for the health systems and worker safety task force for the CDC COVID-19 response. The second presenter is Dr. Kanta Sircar. Dr. Sircar is an epidemiologist on the clinical disease team for the CDC COVID-19 response. And our third presenter is Dr. John Brooks. He is the chief medical officer for the CDC COVID-19 response. It is my pleasure to turn it to Dr. Morris. Please proceed.

Thank you very much.

We at CDC are very interested and want to serve as a resource for healthcare providers on understanding risk factors for severe COVID-19 based on our patient's underlying medical conditions. We hope the information we provide will increase the knowledge of risk which would in turn help providers make informed decisions about having patient care and how best to advise patients in preventing infection from the development of COVID-19. We have developed webpages that serve as living documents that we are attempting to update on a more regular basis to share the information that we have learned. We released a clinician page that is dedicated for healthcare providers to review the evidence that we have looked at and described in order to learn a bit about the risk associated with underlying medical conditions. This clinician page is divided into four sections.

There is background information and actions clinicians can take to keep patients safe, a review of two large cohort studies, conditions associated with severe COVID-19 outcomes, a summary of the literature

on conditions that are associated with severe COVID-19, and additional resources clinicians can use to learn more about COVID-19, diagnosis, treatment, and prevention. Today during the COCA call, we would like to share some background information, review the methods, how we review literature and create the clinician page. We will show the categorizing of the evidence, share with you the findings of those two large cohort studies, and review actions healthcare providers can take. In addition to providing resources that can help to inform your decision-making. With that, I would like to start with the background and then we will turn it over to Dr. Sircar for the methods. Next slide, please. This graph depicts the trends and case counts and rates since January 1, 2020. The orange line here shows the seven-day incident rate, the blue bar is the case counts, and the redline, the daily average number of cases. These data are reported in the U.S. as of May 24, 2021. As you can see or resume no, we are approaching approximately 33 million cases in the U. S. with a seven day moving average of about 23000 cases.

The incidence rates peaked in January and now are declining. Next slide, please. This graph depicts the trends and death counts and rates since January 1, 2020. Again, the orange line here represents the seven-day death rate for the blue bar is the number of deaths by the redline, the daily average number of deaths. Again, as you can see in the box here, the deaths reported in the U.S. as of May 24, 2021, are over 587,000 with the 7-day moving average of approximately 500 deaths per day. The death rates peaked in April 2020 and then again with a higher peak in January of 2021. They are now declining. Although these graphs show us that cases and deaths are declining, we do need to stay vigilant, keep recommending vaccination and other prevention measures, especially among those who are at risk for severe COVID-19 disease.

Next slide, please. This graph depicts the U. S. COVID-19 cases reporting March 2020 through May 2021 by age. Most cases reported were among patient age 18-24.

Diffuse cases were reported 0-5 years of age. We highlight this because despite the fact that the largest number of cases fall in the young adult category, we know that the strongest risk factor for severe COVID-19 outcomes is age. Next slide, please. This slide then reports the COVID-19 deaths reported to CDC by age group. Again, this is from March 2020 through May 2021.

Again, most cases occurred among younger adults as we showed in the last graph, but most deaths occur among the elderly. Approximately 54 million people age 65 years or older reside in the U. S. This age group accounts for more than 80% of U.S.

COVID-19 related deaths. Again, we just want to emphasize that age is by far the strongest factor in COVID-19 deaths. Next slide, please. This table reflects the risk of severe COVID-19 outcome, hospitalization or death, associated with age. As you can see here, the age groups are compared to our reference group, which is ages 5-17 years.

Older adults are at increased risk for hospitalization and other severe COVID-19 outcomes, including ICU admission. This table shows us with increasing age the risk of severe COVID-19 outcome increases exponentially. Physicians who care for older patients should be strongly urging their patients to receive vaccination, in part because the risk for hospitalization and death is so high relative to younger adults. Physicians should consider which elderly patients are immunocompromised and remind them to take continuing precautions even after vaccination. Next slide, please.

Age, as we mentioned, is clearly the strongest predictor of COVID-19, but it does not affect all populations equally. Members of certain racial and ethnic groups when compared to non-Hispanic white

persons are dying from COVID-19 at younger ages. This graph shows us the distribution of COVID deaths. The red bars show you the distribution of deaths. The blue bars, the population distribution, is by race.

In these data, the ages standardized so that racial and ethnic groups can be compared. Thus, this graph shows us what disparities would look like, assuming the same age distribution is the 2000 standard population. COVID-19 deaths disproportionately affect Hispanic, non-Hispanic black, and American native. We are still learning how race and ethnicity, social determinants of health, including neighborhood and physical environment, housing status, occupation, education level, food security, access to healthcare, and economic stability can influence the risk for infection and severe COVID-19 outcome. Physicians who care for patients in these racial and ethnic groups should work to ensure that their patients are both vaccinated, understand this risk, and take proper prevention methods.

Next slide, please. I will turn it over now to Dr. Sircar to talk about the methods.

Thank you. To learn more about underlying medical conditions that increase the risk for severe COVID-19 outcome, we initiated the use of the scientific literature. These literature reviews allowed us to identify new associations and update knowledge on known associations as information becomes available. I'm going to go a bit into the methods we use for these before talking about the underlying medical conditions on our website. First, why did we do these literature reviews? The summary of information reflects current evidence regarding underlying medical conditions and is intended to help healthcare providers to make informed decisions about patient care and to increase the awareness or risks among their patients.

Next slide. If you have not been to this page already, this is a screenshot of our evidence page. When we talk about underlying medical conditions, we predominantly mean conditions that are pre-existing. We predominantly mean that they are chronic conditions. We do include one risk factor.

That is smoking. Early in the pandemic, much of the emerging evidence focused on describing COVID-19 cases who are hospitalized and who had died. Many prevalent conditions such as obesity and diabetes were some of the first to be identified. An initial review of the literature was completed June 2020 by CDC subject matter experts. It was last updated between November 2020 and early 2021, depending on the underlying condition.

It is listed on the page. The newest addition to this page was evidence of having an underlying condition and being pregnant or having a recent pregnancy. This was added in May. The amount of literature on COVID-19 and underlying medical conditions continue to increase. To understand what all this means, we've updated our review process.

Our current literature review process begins with the CDC subject matter expert for respective underlying medical conditions, a library income and a literature review subject matter expert working together to create these terms. Then they develop inclusion and exclusion criteria. Manuscript titles and abstracts are then screened for full text review. Data is extracted and evaluated for the risk of bias. This information is aggregated to be evaluated for strength and direction of balance.

When we talk about evidence, we include findings from CDC investigations, published reports, scientific articles, on reviewed preprint, and internal data. Next slide. So, what are we looking for? We identify studies that looked at patients who had COVID-19 and the presence of the underlying medical condition. Ideally, compared to a COVID-19 patient who did not have the underlying medical condition,

in these studies we also look for other factors such as demographic characteristics, including age, sex, and race. We also have studies that account for socioeconomic status and account for known underlying medical conditions.

We define severe outcomes as hospitalizations, intensive care unit admissions, invasive mechanical ventilation, or death. Next slide. So, we have organized our list to align with a hierarchy of evidence. This is a screenshot of how our literature is listed on our webpage. On our scientific brief webpage, we present evidence on certain underlying conditions in the categories that follow the hierarchy of evidence.

The hierarchy of evidence is a ranking of studies based on methods used. Although some underlying medical conditions such as obesity and heart disease have a large body of evidence that's consistently demonstrating a strong association of severe outcomes, other underlying medical conditions are harder to detect. For example, literature on rare conditions or less common conditions where it took time to establish enough sample size to do more than a case study or case report may not have cohort studies. Presenting these data in this way, hopefully, allows us to provide additional insight and the categorization allows clinicians to easily access the quality of evidence. Within each category, the conditions are listed alphabetically.

In addition, because our knowledge of underlying medical conditions is based on the ever evolving literature, this list may not be reflective of all underlying medical conditions. Next slide. So, this list of underlying medical conditions was categorized into four groups, primarily based on the study methods used in that publication. The groups include data analysis for systematic will you, observational studies, for example, case-control, cross-sectional, or cohort, case series or case reports, and studies that have mixed evidence. These are consistent with the hierarchy of evidence.

I will explain each one as I go along. Next slide. The first category is those conditions supported by a meta-analysis for systematic review. This category has the strongest evidence, meaning there is consistent literature showing in association with severe outcomes. The blue star indicates literature on pregnancy or having reached a recent pregnancy and having underlying medical conditions -- or a respective underlying medical condition.

The list is in alphabetical order and includes cancer, cerebrovascular disease, chronic kidney disease, COPD, diabetes myelitis, heart condition, obesity, pregnancy and recent pregnancy, smoking, current and former. This category has medical conditions from where the association with severe outcomes are well-established but it also has one risk factor. That is smoking. As you can see, conditions are listed in larger groupings. For example, heart disease includes coronary artery disease, heart failure, and cardiomyopathy's, among others.

These groupings may reflect how conditions were devised in early studies that used large grouping algorithms. We will go back to that framework later on. Next slide. In this category, there is a growing body of literature to support the underlying medical condition being associated with severe outcomes. At the time of the review, no meta-analysis for systematic review had been identified.

However, there was evidence from case-control or cross-sectional studies. This list includes certain underlying conditions in children, down syndrome, HIV, neurologic conditions, overweight, other lung diseases, sickle-cell disease, solid organ or stem cell transplantation, substance use disorder, use of steroids or other immunosuppressant medications. Again, we see conditions such as being overweight and some not so common conditions such as Down syndrome. There are also groups of conditions in

this category. For example, certain underlying medical conditions in children, which includes many, many underlying medical conditions in children and those risks of underlying conditions might very.

Next slide. In this list, these conditions have been studied by 1 or more case series or case reports. If more complex study designs are used to study these conditions, the sample size was small. At the time of the review, no systematic review or meta analysis was conducted on these conditions. This list includes conditions that are less common.

However, we do expect that the body of evidence to support the Association of less common conditions with severe COVID-19 outcomes will grow with time and there will be a broader range of studies conducted. Cystic fibrosis and Thalassemia currently are on the list. Next slide. In this category, it is hard to reach a conclusion about the association of these underlying medical conditions with severe COVID-19 outcomes. While some studies of a specific underlying medical condition found an association, others did not.

One reason may be that the definition of an underlying medical condition, for example, liver disease, is too broad. It needs to be better defined into subcategories. In addition, there are four outcomes that define severity. Hospitalizations, intensive care unit missions, invasive mechanical ventilation, and death. The underlying medical condition may be associated, for example, with invasive mechanical association but not with that.

As mentioned previously, we are looking at the literature for new information. For this group of conditions, we are currently reviewing the literature to better understand what is known, which means that may be in different levels of severity or subgroups. As the Association becomes clearer, these conditions will be redefined into those subgroups. These conditions include asthma, hypertension, immune deficiencies, and liver disease. Next slide.

So, I am not going to present all the evidence that we have to support each of the underlying medical conditions that I just mentioned. Instead, I will present findings from two large cohort studies that are featured on our website. These are used to highlight some common themes that we seen in the literature, such as, one, age is a strong risk factor. Two, severity plays a role. Three, having more than one underlying condition may increase your risk for more severe outcome.

First, let me describe the studies. Next slide. The first study, which we will refer to as Rosenthal is a large geographically diverse hospital-based service level ballplayer database which represents approximately 20% of all inpatient admissions in the United States. The study includes over 64000 inpatient and hospital-based outpatient visits with laboratory confirmed COVID-19 diagnosis between April and May This study was designed to examine risk factors associated with in-hospital mortality and the analysis was conducted using logistic regression among adults. The outcomes they looked at was in-hospital mortality.

Next slide. So, the second study which we will refer to as Williamson was conducted in the United Kingdom and uses data from a health analytic platform that covers 20% -- excuse me, 40% of all patients in England. That's over 14 million adults. This study linked primary care records to death data to examine factors related to COVID 19 associated death. Over 10000 COVID related deaths from February through May 2020 were included in this study.

The analysis was conducted using multivariate cross proportional models adjusting for age, sex, body mass index, smoking, and an indicator of socioeconomic status and many underlying medical

conditions. This study describes the risk of COVID-19 related death by severity of some underlying medical conditions. Next slide. So, here are some of the results from Rosenthal. This study used in-hospital comorbidity, grouping into larger categories.

For example, any malignant neo- plasma. These groups can then be assigned a weight, which forms comorbidity index. This index is associated with long-term survival. The adjusted odds ratios are listed on the right. It's in the order from smallest to largest.

As you can see, they are close in the strength of association ranging between 1. 1 and 1. 57. History of tumors had the highest odds ratios. When comparing these odds ratios to age, they are relatively small.

And not shown on the slide is the adjusted odds ratio of age, which ranges from 2. 12 and those 35-49 years old and 16. 2 in those over the age of 40 compared to those 18-34 years old. One note about hyperlipidemia which is also related to hypertension. These are some common conditions.

Actually, the two most common underlying conditions in the United States. Without information on severity or medications, it might be difficult to describe the Association. Studies report a wide range of association from adjusted risk ratios above and below. Some studies have identified a reason why relationships are not as clear. Next slide.

So, severe underlying medical conditions were looked at but defined conditions differently than Rosenthal. Williamson used cutoffs based on severity. Here are two examples and there are a few more in the paper. Patients with diabetes are categorized. Those with a hemoglobin A1c lower than 7.

5%, and a hemoglobin of A1c greater than or equal to 7. 5%. Patients with diabetes with a higher hemoglobin A1c have a higher adjusted ratio when compared to those not having diabetes. Similarly, non-hematologic cancers were categorized. This may be an indicator of several possible placards, including tumor size, recent surgery, or therapies.

This includes diagnosed less than 1 year ago, diagnosed between one and 4. 9 years ago, and diagnosed over five years ago. As you can see, those who had most recently been diagnosed had the highest adjusted hazard ratio. Those diagnosed over five years had no significant -- nonsignificant adjustments. Next slide.

The last example looked at reduced kidney function. Here is reduced kidney function by those with the eGFR between 30-60 and those within eGFR of less than 30. As you can see, those between West 30 have a higher adjusted hazards ratio compared to those between 30 and Next slide. Lastly, the number of underlying medical conditions may be an indicator of severity. Here is one example.

Rosenthal used cost of the comorbidity index score to indicate multiple comorbidity conditions. Those who died at an average index score of 3. 1 compared to those who survived, which was 1. 1. The score accounts for the number of underlying medical conditions, and for some conditions the severity of the condition.

They also looked at the frequency. Of those who had zero comorbidities, 97. 2% survived and only 2. 8% died compared to five or more where 66. 6% survived and 33. 4% died. In summary, underlying conditions are associated with severe COVID-19 outcomes. Factors such as severity of underlying medical conditions and the number of underlying medical conditions are also important factors. It is

important to note that age still remains one of the strongest risk factors. That's the summary of what we know of underlying conditions as a whole.

I will turn it over now to Dr. Brooks so we can talk about what candy done.

Thank you so much for that really nice presentation. I am thinking about when we gave this talk, a COCA call about a year ago and how really far we have come in our understanding in just a year in this topic area of underlying conditions and their effects on people who have had COVID. Let's move forward to the next slide. What I want to do today is just go over, for those of you on the line at work in a clinical capacity, I want to share with you some of our thoughts about what we can do as clinicians to help our patients minimize their risk of bad outcome if they get COVID-19. Again, I just want to reiterate probably the most important thing you can do is get them vaccinated.

This is our healthcare provider landing page. If you are a clinician and you want the detailed information that was described in the last 30 or 40 minutes. As an agency we do the reviews and ring things and I hope that for those of you looking for a deeper dive that that will provide useful information for you. Next slide, please. I should mention that healthcare providers are some of the most influential people in the lives of patients, including me.

I listen very closely to my own healthcare provider, but particularly with regards to COVID-19. Your advice can really change somebody's life. It is important for us all to educate our patients about the risk for severe COVID-19 infection. A really quick and effective way to do it with a busy practice or if you do not have a lot of time is to recommend this webpage. This is the companion webpage that goes with the one we just show before for healthcare providers.

This is intended for the general consumer to help them better understand the risks associated with underlying medical conditions. This page is updated in sync with the healthcare provider page with new evidence as it becomes available. If you look up in the top left corner under the title people with certain medical conditions, you can see the date and it was last updated May 13. Next slide, please. So, these are three Carrie -- three key areas I wanted to talk about we can encourage patients to do things to protect themselves.

In addition to educating patients about their individual risks, there are a lot of actions we as providers can undertake to help keep patients safe. We are including here several strategies to be described in the webpage. These are some that we think are particularly or exceptionally effective. Of course, it is not a complete list. I'm sure we will be learning more as time passes.

Of course, the very first recommendation and you will hear this a lot from us these days because we have this tremendous intervention. We can offer vaccination. We really need to work together to educate and encourage everyone to be fully vaccinated against COVID-19 and to do it as soon as it is possible when the vaccine is available to them. At this time in the United States, we now know that over 90 percent of Americans live within 5 miles of a drug store or or another outlet where they can get vaccinated. Vaccination is our best defense against this virus, and vaccination is safe and effective for most individuals.

I want to make an important point here. We have evidence that it works in people with underlying medical conditions with a few exceptions that we will talk about in a moment. So, consider your patient population. Make certain to reach those who are reluctant to be vaccinated in creative ways that are acceptable to them. We found in our experience here that that may include things such as working

collaboratively with local leaders, with trusted voices in a particular community, with faith-based organizations and other influencers and possibly also having patients share their own experience of vaccination within their social circle.

To me at least sometimes there's nothing more powerful than my friend recommending it to me and telling me it was a good thing to do. I also want to point out that it's surprising, perhaps to some that convenience makes a big difference. The more we can access vaccination making it convenience, convenient, the better. I'm thinking in particular about folks who cannot get away from their regular 9:00 to 5:00 jobs. If you are a large employer giving people time off to get vaccinated are creative ways you can expand the impact of vaccination.

Okay. Second recommendation is to encourage patients to adhere to their treatment regimens for it I don't mean treatment for COVID. I mean the treatment for their underlying medical condition. I'm sure this makes perfect sense, but we've just been through a year where people were for a large part of that time hunkering down, limiting their travel exposure. One of the things people have limited a lot was going to the doctor.

It was perceived early on as a place where people could be infected. We have made healthcare settings much safer and I feel very confident our healthcare setting is a very safe place for persons to go, particularly those with these underlying medical conditions. Not only it may put them at greater risk for severe disease, but importantly here they need to be paid attention to. Some people have set aside visits for various conditions and suffered from that because they were not maintaining their regular care even with the accessibility and the availability of telework. That is critical to maintain.

I think as you have seen in the slides shown earlier, we have seen the more severe the underlying medical condition and the greater number of underlying medical conditions steps of that risk for poor outcome. It is really important in particular to help manage those persons with multiple comorbidities, to keep those as best under control as possible. Okay. Moving on. Third one.

Encourage patients to keep their regularly scheduled medical appointments for routine care. That sort of fits in with what I was speaking about before, but if you have a person who is still hesitant to come into the clinic and there are, certainly, plenty of people out there, and we have to understand and accept it, but there are things we can do to work around that. Not just telehealth. Of course, not everybody has access to a computer, particularly in rural areas. Broadband is limited, but you can do car aside visits.

I have a very creative good friend of mine who is a dermatologist who has a whole system for doing dermatological exams, including biopsies, in the parking lot car side. You can do telephone check ins as well. Some people if they have a smart phone may have access to face time. Of course, this is a circumstance where if patients missed their regularly scheduled visits, follow-up is very important. Let them know you care about them and you are following up with them.

Those of you who are engaged in this work know how important that reach out and touch can be to engage the person helping make sure they are safe and arranging the next appointment. Let's go to the next slide. What I wanted to talk about here are some of the actions that healthcare providers can take to achieve a lot of these goals. First of all, this slide is a general reminder that we all have a lot of work to do to prevent COVID-19, each of us in the healthcare sector and out there in general. We have a role to play here.

It is particularly vital for healthcare providers to share prevention methods with patients. Sometimes we are very focused on the treatment, but as you all know, it's about a cure. This is also a reminder physician's may wish to consider individual patient risk and remind patients who are severely immunocompromised -- this is a special group I was speaking about earlier. Remind people who are severely immunocompromised and those at risk for severe COVID-19 infection to really practice prevention methods such as wearing a mask, maintaining physical distancing, washing hands frequently. These are the groups in particular persons who are immunosuppressed from an underlying condition such as inherited immunodeficiency or an immunodeficiency related like cancer, but also those people who may be taking medicines intended to suppress their immune systems such as persons with an organ transplant who need mycophenolate, for instance, for organ rejection.

Or persons who have underlying disorders, or people who may be having other conditions where some of these drugs are used. We really want people in this group to consult their clinician even after they are fully vaccinated to decide whether they want to follow our guidelines or whether it may be more cautious until new infections are further down and more people are vaccinated for them to continue following our advice. I will note that many people who are immunosuppressed following vaccination do develop some measurable response but others do not. We don't yet know exactly how to see what correlates with protection or if some people who do not develop an antibody response are protected. I always think of the example of hepatitis B in the healthcare sector.

If any of you have worked in the infection control office of the hospital, you will probably recognize that a good fraction of people get vaccinated with hepatitis B vaccine and still never develop the antibody response we want but we have plenty of data that those people are not getting hepatitis B. We don't know that that's true. I just want to be cautious. We don't know that that's true for COVID, but as a principal, we do not yet know the absence of antibodies and what that means in terms of risk. We are trying to figure that out.

In that case, I think I might be a little cautious about persons who are immunosuppressed from following our fully vaccinated guidance. As always, even the things are looking better and better right now. Be vigilant for signs of disease if you have underlying medical conditions. Next slide, please. All right.

This is at least one slide, maybe more, on additional resources. Let's end at this one and then we will take questions. This is the last slide. I think the slides will be publicly available. If you cannot copy this down, these are just some webpages we thought could be useful both for the general public as well as clinicians related to risk associated with underlying medical conditions.

They provide these links. I hope that you will take advantage of these and use them. Lastly, just a reminder to everyone, if you have any questions after today's webinar or need to seek some consultation, 1-800-CDC-info. That the number you can call and we will try to have operators refer you to the proper person to consult with. I think I will stop there and we will take some questions.

Thank you, Dr. Brooks. We will go into the Q&A session now. The slides are available. You can find these resources that Dr. Brooks referenced for you. Our first question asks, have you found underlying conditions that are a risk factor to also correlate with long COVID?

I love it. That's a great question. I am not aware. My colleagues may know also, but I am not aware of any particular underlying medical condition that increases the risk for post COVID conditions, particularly long COVID, the terrible fatigue, headaches, confusion. Certainly, and other problems that go on for months after a person is recovering from COVID.

However, what I do know is that there is a general correlation between the severity of illness that a person experiences when they have COVID and the risk for long COVID. In that respect, the fact that people with underlying medical conditions are generally at risk for more severe disease, in that way they may be at greater risk for long COVID.

Just to add to that -- Dr. Brooks, thank you. I agree. There are a number of different ways in which this question is being looked at. I do think that eventually we will have more information.

At this time we do not have data to directly look at it, but the indirect link that you mentioned I think is very relevant. Some of those studies look at the natural history of COVID itself and others are looking at kind of more of a registry approach. Those that do experience long COVID and then able to eventually look at that data to ascertain if there is any correlation or association.

Thank you very much. Appreciate that. And for our audience, please stay tuned because we are having a COCA call next week titled evaluating and caring for patients with post COVID conditions. That would also be very informative. Next question asks, is uncontrolled diabetes worse than a diabetic who is, in fact, managing their diabetes and other related risk factors as well?

This is John. I can start to answer that. I mean, certainly, in terms of their diabetes control, it's worse. We want people to make sure that there underlying medical condition is controlled in the first place because it is just unhealthy for them and already poses a challenge to their good health, even in the absence of COVID. As was shown earlier, I can't recall if that was diabetes or the example.

I don't have it right in front of me. In general, the principle is that the more severe the underlying -- if there's a single medical condition, for a single underlying medical condition, the more severe that condition is across the spectrum of its severity, the greater the risk is for the person to have severe COVID. For example, asthma, a whole range of asthma from people that are very mild to severe. There is some evidence that more severe could be at greater risk. Similarly with cardiovascular disease.

I believe the same is true for diabetes, but let me check with my other colleagues here.

Sure. Thank you, John. The study I share looked at hemoglobin A1c and showed those who have a higher hemoglobin A1c had a higher adjusted hazard ratio but we have seen this across other studies also. For patients with diabetes, it does look like those who have uncontrolled diabetes will have -- there is a stronger association with severe outcomes. Over.

Thank you so much. Our next question asks, and I'm assuming this is talking about individuals that are vaccinated, should people with underlying conditions have different precautions when it comes to masking?

Bright. Certainly, for the group of persons who have -- let me back up. When we talk about fully vaccinated people, we are talking about a suite of interventions that they may now begin to reduce. The first when people think of tends to be masking, because it has been probably the one that has been most on the public mind for quite some time and the one that people are often the most grateful to no longer have to follow. It does also include social distancing or physical distancing and avoiding crowds and some of these other measures.

That said, speaking specifically about masking is one of these prevention measures. For many people with underlying medical conditions, there is not really any reason to believe that after vaccination the

quality of their immune response to the vaccine and the extent to which they are protected will differ from anybody else. The exception to that rule, and that would really drive the decision around reducing prevention mothers. The exception to that rule are as I described earlier, persons who are immunosuppressed or compromised, you know, underlying illness or in medical treatment. Those are persons who absolutely think twice, talk to their provider, and make it carefully informed decision as to whether they really want to wait before they take that mask off.

Great. Thank you very much. Next question. Some variants are deemed to be more transmissible. Is there more severity to them when it comes to patients that may have underlying conditions?

That the great question. I think that is a concern everybody has. When viruses mutate, the way they can do us harm is really kind of two flavors. They either can be more transmissible, so they moved to the population more quickly and more of us get infected or they can be more severe and make us sicker. Of course, that is not generally in the virus best interest.

They do not want to get rid of those too quickly, but, you know, they can sometimes evolve. It's not natural. We do not expect viruses to evolve. That tends to be more or can be sort of a spontaneous event. So, what we have seen is foremost, they do not appear to be more severe in people without underlying medical conditions.

In that respect, we do not expect that they would be any more severe in people with underlying medical conditions. The same risk for severity as you would have if it were the old virus that was circulating sometimes called the wild type. Some people have heard that one of the variance in particular, the one first described in the United Kingdom, that it has been seem to be associated with more severe disease. The association there is very interesting. It isn't that it's making people sick or but rather it is making more people sick enough that they have to go to the hospital.

It's more transmissible as well. What we are finding, at least the studies from England which have had enough time to really examine this question, is that more people with the infection are being admitted to the hospital, but once you get into the medical system, survival is the same. In that respect, it is not more virile and. What we think is probably going on is the greater transmissibility is driving to larger number of persons requiring hospital-based care, and in that sense there is more severe disease.

Great. Thank you so much. I think we have time for one last question. The question asks, when discussing strategies as you did, can you speak about strategies for underlying conditions that may be beyond medical management just based on the nature of the condition itself? What are some strategies that are effective?

Yeah. This is difficult, isn't it, to have to work with -- not have to, but to have the privilege of working with people who it is not easy to manage because they have things that are hard to take care of. I think in these sort of circumstances, it is focusing on what we know you can do to improve symptomatic care and quality of life. I am saying this with the understanding that for those conditions which you confer increased risk for COVID that you have got to also -- I'm sorry, increased risk for severe disease. For those conditions that may be associated with severe disease and increased risk, you need to do as much as you can to prevent getting COVID but we have talked a lot about that.

Vaccination, of course, is your best first go to, but I would suggest for persons who are concerned about this that this advice about not having to wear a mask all the time if you are vaccinated, even if you know or there is no reason why you would get the full punch from the vaccine, you do not have to take the

mask off. You can still social distance. I would recommend people make these changes at a pace that suits their comfort level. You know, we have been through a lot. Some of us have seen some pretty bad things.

This may not be the right time yet for everybody to sort of make that first step, but the time I hope will come. For people who do have these more difficult conditions that do not have immediate treatment, really focusing energy on symptom management and improving quality of life is a great way to go. I am, personally, a very big believer in exploring alternative therapies. There is an Institute at the national Institute of health. I am not sure how they work, but I have, certainly, have had plenty of experience with folks saying, that works for me.

Finding what works for you is the most important thing.

Dr. Brooks, I just also wanted to make a couple comments if I can.

The floor is yours. Two things. People become very concerned about what's included or have we thought about all of these conditions. We can only rely on the data that is presented to us or is out there. I think it's very important to understand that there are conditions for which we may not have a large enough cohort of patients to be able to really look at the data in the same way.

Case reports are important, so for those providers out here who are seeing patients and noticing things, we encourage you to try to get things in the literature, because it is important to share this experience. Also, just to say that we are trying to, you know, institute a process that will start to look at these rare conditions. I also want to kind of put a plug in for our medical society partners. They have done a tremendous job in their areas of expertise in trying to look at these conditions that may not have a large enough cohort to end up publishing studies or no one's publishing studies on these individual patients with these individual conditions. There is guidance that I think can be brought to bear from our medical society groups that we are all trying to work very closely with.

We encourage questions through CDC info. Please know that we are attempting to look at rare conditions and that we still have a lot to learn about associations with severe outcomes. I don't know if we want to add anything to that.

Thank you for that. That's terrific. Thank you very much. Very important.

Yes. Thank you.

Thank you so much. I would like to thank everyone for joining us today with a special thanks to our presenters. While continuing education for COCA calls are issued online through the CDC training and continuing education online system. Again, the web link can be found on our slides. Those who participate in today's call and wish to receive continuing education, please complete the online evaluation by June 28, 2021 with the course code WC2922-052721.

The access code is COCA052721. Those who will participate in the on-demand activity and wish to receive continuing education should complete the online evaluation between June 29, 2021 and June 29, 2023. Use course code WD2022-052722. The access code, again, is COCA052721. It continuing education certificates can be printed immediately upon completion of your online evaluation.

A cumulative transcript of all CDC/ATSDR CEs obtained through the CDC training and continuing education online system will be maintained for each user. Today's call will be available to view on-demand a few hours after the live call. You can find the video recording of today's call on our webpage. You can find all of the links and resources that we have shared today at that same link. Like I mentioned earlier, join us for the next call we are free continuing education will be provided.

The next scheduled call, evaluating and caring for patients with post COVID conditions will be held one week from today on Thursday, June 3rd. This COCA call will be at 2:00 p. m. Eastern time. More information and call announcements will be available soon and you can find more information online.

Please share the call announcements with your clinical colleagues. Also, remember to sign up to receive weekly updates by visiting the web link provided here. COCA announcements for upcoming calls and other products are sent via e-mail. In addition to our webpage, please subscribe to receive notifications about upcoming calls or other call and services. Be sure to subscribe to receive notifications.

We invite you to join the e-mailing list by visiting our webpage. Finally, to stay connected to the latest news, be sure to like and follow us on Facebook. Again, thank you for joining us for today's COCA call, and have a great day.