

COCA Call: The Burden of Influenza and Chronic Illness.

Date/Time: December 2, 2010 (2:00 PM- 3:00 PM ET)

Speakers:

Dr. Joseph Bresee, Chief, Epidemiology and Prevention Branch Influenza Division – CDC

Dr. Pamela Allweiss, Consultant, Division of Diabetes Translation – CDC

PA Anthony Brenneman, University of Iowa Carver College of Medicine Physician Assistant Program,

RN Kerri Holloway, Fresenius Medical Care North America.

Coordinator: Welcome and thank you for standing by. At this time all participants will be in a listen-only mode until the question-and-answer session. Today's conference is being recorded. If you have any objections, you may disconnect at this time. With that it is my pleasure to turn over today's call to Ms. Loretta Jackson-Brown.

Loretta Jackson-Brown: Thank you (Tricia). Good afternoon. I'm Loretta Jackson-Brown and I'm representing the Clinician Outreach and Communication Activity, COCA with the Emergency Communication System at the Centers for Disease Control and Prevention. I am delighted to welcome you to today's COCA conference call, The Burden of Influenza and Chronic Illness.

We are pleased to have with us today Dr. Joseph Bresee, Chief Influenza Division at Centers for Disease Control and Prevention, Dr. Pamela Allweiss, Consultant, Division of Diabetes Translation at Centers for Disease Control and Prevention. In addition to our CDC presenters, we have two presenters representing our COCA partner organizations.

From the American Academy of Physician Assistants, we have Physician Assistant Anthony Brenneman, University of Iowa Carver College of

Medicine Physician Assistant Program and from the American Nephrology Nurses Association we have R.N. Kerri Holloway, Fresenius Medical Care North America.

During today's call, you will hear the presenters referring to slides in their PowerPoint presentation. The PowerPoint slide set is available from our COCA Website at emergency.cdc.gov/coca. Click on COCA Calls. The slide set can be found under the call-in number and call passcode.

The objectives for today's call are that participants will be able to list current advisory committee on immunization practices, recommendations for influenza vaccination, identify the types of vaccines and antiviral coverage that are appropriate for people with diabetes, describe key sick day rules healthcare providers should emphasize to people with diabetes, identify indications and contraindications for influenza vaccination in individuals with cancer, and discuss the vulnerability of the chronic kidney disease population to influenza.

Following the presentation, you will have an opportunity to ask our presenters questions. Dialing star 1 will put you into the queue for questions. In compliance with continuing education requirements, all presenters must disclose any financial or other relationships with the manufacturers of commercial products, suppliers of commercial services or commercial supports as well as any use of unlabeled product or products under investigational use.

CDC, our planners and our presenters wish to disclose that they have no financial interest or other relationships with the manufacturers of commercial products, suppliers of commercial services or commercial supporters.

This presentation does not include the discussion of the unlabeled use of a product or products under investigational use. There is no commercial support for this presentation.

Today's first presenter is Dr. Joseph Bresee. He is a Captain with the U.S. Public Health Service and Chief of the Influenza Division at CDC. He serves as the principal liaison between CDC and the advisory committee on immunization practices on influenza vaccine recommendations for the United States and leads the committee's influenza vaccine working group.

The next presenter will be Dr. Pamela Allweiss, Endocrinologist at University of Kentucky Medical School and Consultant, Division of Diabetes Translation CDC.

During the 2009 H1N1 pandemic, Dr. Allweiss developed content for education of healthcare professionals and consumers and conducted multiple presentations within CDC and outside of CDC on the topic of diabetes and the flu.

Following Dr. Allweiss will be P.A. Anthony Brenneman, Associate Professor and Associate Director, University of Iowa Physician Assistant, Internal Medicine, Adult Bone Marrow Transplant University of Iowa Hospital and clinics Iowa City at Iowa Carver College of Medicine and Physician Assistant Program.

Our final speaker will be R.N. Kerri Holloway, Infection Control Specialist and Clinical Quality Manager at Fresenius Medical Care North America. A dialysis nurse for more than 30 years, Ms. Holloway is the Corporate Infection Control Specialist for Fresenius Medical Care where she is responsible for developing policies and procedures related to patients' infection prevention.

If you're following along on the slide, you should be on Slide 6. Again, the PowerPoint slide set is available from our COCA Website at emergency.cdc.gov/coca. At this time, please welcome our first presenter, Dr. Bresee.

Joseph Bresee: Yeah, thanks, Loretta. Everybody, this is Joe Bresee. I'm from the Influenza Division. Thanks for the chance to lead off this call. I wanted to give everybody a short update on some of the salient parts of influenza that mainly focus on influenza vaccine recommendations and turn it over to the experts to talk about influenza in special subpopulations.

If you look at Slide 8 first, let me just say a couple of things. First that as you know, influenza disease and timing of disease varies pretty substantially from year to year and is unpredictable.

That said, five to 20% of the U.S. population are infected and the highest infection rates are among children each year. CDC has updated its estimates on the mortality associated with influenza disease annually.

Just this year and we estimate that somewhere around 3000 to 50,000 people die each year of influenza. More people die in years where influenza AH3N2 viruses predominate and as you know most of those deaths are among people over 65 years old.

In addition an average of about 220,000 hospitalizations occur each year and again the majority of those occur in people over 65 years old as well. If you look at [slide] 9, it's meant to make the point that even though everybody can get the flu each year and should get the flu vaccine each year, there are clearly

subpopulations that are at higher risk of acquiring influenza complications if they get an influenza infection.

In addition to kids, young kids, especially kids under two and people over 65, pregnant women, Alaskan natives and American Indians, the long list of things you see there are people with underlying diseases who we know have higher risk of complications, hospitalizations and death if they get influenza infection and therefore are important to protect with vaccination and we'll get to that in a minute.

Evidence of that is given on Slide 10. Slide 10 represents some data from the pandemic last year which again showed us that people with underlying health disorders, some at least were more likely to get severely ill with influenza.

I won't go through the slide in detail but just notice that the bars represent the prevalence of underlying risk factors - underlying known risk factors - that I listed on the page before among people hospitalized in the first bar, among people who died in the blue bar, the middle bar, and among the general U.S. population in the green bar.

And just notice that the prevalence of those conditions in the more severely ill people are always higher than the prevalence in the general population indicating again that people with those conditions have a higher risk of severe outcomes should they get infected with flu each year.

In Slide 11, I just want to highlight that ever since HHS or the Public Health Service began to make influenza vaccine recommendations in 1960, and this is a screenshot of the first recommendations that were written down from the Public Health Service.

And if you look at Slide 12, you see the inset that I highlighted in Slide 11 just to show that even from the very first, it was clear that people with underlying cardiac pulmonary and endocrine disorders were at higher risk for influenza complications and therefore were targeted early on for vaccination.

In Slide 13 you'll see that despite the fact that we started targeting high-risk groups early on more than 50 years ago, over the last decade or so there's clearly been an expansion of influenza recommendations to include more and more people and that represents the realization and appreciation of the fact that the disease burden is broad with influenza and everybody has a chance of getting sick and severely sick.

And you don't have to read the whole thing but look at the part I've circled down at the bottom. Note that this year for the first time, CDC's recommending that everyone over six months of age get influenza vaccine to protect themselves against influenza and to protect their loved ones from getting influenza from them.

If you go to Slide 14, note that the recommendations this year are for a single vaccine and not two vaccines. Remember last year we had a pandemic vaccine and a trivalent seasonal vaccine. This year post-pandemic we're back to just the trivalent seasonal vaccine recommended for everybody over six months of age without a contraindication.

And note that the vaccine strains in the vaccine this year will include the pandemic strain from last year. In addition, a slightly updated AH3N2 strain and the same B strain circulated that was included in last year's vaccine in the U.S.

Note that every one of these strains is circulating in the U.S. and globally right now and so we think that the vaccine not only is important but should protect against the viruses we're seeing this year and just to finish that up, the next two slides represent an update on what we are seeing in the U.S. given our surveillance at CDC.

In Slide 15 we're looking at outpatient visits and this is trends in outpatient visits associated with influenza-like illness and you see that at the far right side of the graph, we're starting to trend upwards in terms of influenza-like illness but not yet seeing much disease nationally.

But if you look at the map which is on Slide 16, this represents state health departments' assessments of how much flu they're seeing. You see that we're not seeing much flu most places in the country but just in the Southeast United States we're starting to see an increase in influenza activity now.

So it looks like we're just getting the season started right now which goes back into our recommendations for vaccination. It should be done as soon as possible before influenza gets in your community.

And so my key points are clearly in Slide 17; clearly people with chronic medical conditions are at higher risk and many of those people don't know they're at higher risk and outreach is needed for those people.

But universal vaccine recommendations this year for the first time should encourage not only everybody to get vaccinated but hopefully will increase the coverage of people around people with high-risk conditions therefore decreasing their risk of getting infected.

Finally vaccine coverage despite having been recommended for high-risk populations for over 50 years still is way too low and we need to bring that up to protect more people and finally we're just getting started with the season and now is a great time to get vaccinated. That's all I had and I'll turn it over to Dr. Allweiss.

Pamela Allweiss: Well, thank you very much for this wonderful background because it's really helping to make the case on why people with chronic conditions especially folks with diabetes should get the flu shot.

We've also seen that some of the people at high risk such as the American Indian/Alaska Native population also have a very high burden of diabetes. We have an epidemic of diabetes with about 24 million people who have diabetes so we have a lot of work to do.

If we go to Slide 19, the objectives are that we want to show you the impact of influenza on people with diabetes, four messages for action to reduce the impact of flu upon people with diabetes and also some tools that you can use.

If we go to Slide 20, it isn't just the flu for a person who has diabetes. Influenza can be a very serious disease. It's much more dangerous for adults and children who have diabetes. They are much more apt to develop secondary complications such as pneumonia.

People with diabetes are six times more likely to be hospitalized with influenza complications, and almost three times more likely to die from this plain old simply flu.

The other thing is anytime a person with diabetes gets any type of infection, blood sugars can fluctuate. Certainly we can see blood sugars go up and

sometimes with people with diabetes that are monitoring their sugars on a regular basis know that they might have some type of infection because their blood sugar levels might go up.

But on the other hand if they're not eating because their appetite might be decreased because they are sick, their blood sugars may actually go down. So it's very, very important to monitor the blood sugars as we'll talk about later. But people with Type 1 diabetes certainly are at risk of developing diabetic ketoacidosis if they do get the flu.

Slide 21, these are the four messages that we want providers to know. We want to increase the vaccinate rate. We want the providers to use antiviral drugs early in people who have diabetes and symptoms of the flu.

We want to be sure that you and your patients know sick-day rules. Diabetes is a chronic condition. We have to teach people self-management skills and the fourth message is to encourage your patients to take everyday precautions. We cannot forget about that.

Slide 22 is what can we do? Who should get vaccinated? Well, as Dr. Bresee said, everyone but especially you as a healthcare provider. Last year during the H1N1 pandemic many healthcare providers did not get the H1N1 vaccination.

We really want the healthcare providers and everybody who works in your offices to receive an influenza vaccine; very, very important as just a role model and the vaccine works.

Slide 23, in people with diabetes, if they get the influenza vaccination it's associated with a 72% reduction in hospitalizations in people who have diabetes so it definitely works.

It's the most effective intervention for reducing the impact of influenza and we also want people to know and we also want people to know that they need the shot, not the nasal mist. People need the dead vaccine so to speak. They definitely need the shot, not the live virus so we want people to understand that.

We also want people to know that they need a pneumonia shot at some point as well, but the thing is only 32% of people with chronic conditions including diabetes had a flu shot in 2008-2009.

People with any chronic condition are so busy handling all the aspects of their chronic conditions that sometimes getting a plain old flu shot is buried so we really want to increase that uptake of the flu vaccine because it is very, very effective in decreasing the complications.

Slide 25, vaccination is also important for people who live and work and take care of people with diabetes as well. Getting your flu shot is part of an overall diabetes management plan and as we said before, pneumococcal vaccine should be given at some point as well.

Slide 26, these are some steps that you as a clinician can do to increase your patient vaccination rate and as I said before, be sure that you and everyone who works in your practice is vaccinated and also tell your patients this because it says okay, if my healthcare provider has done it, at least they're walking the walk.

The other thing is to recommend the flu shot at every patient encounter, from the moment the flu shot is available until December, January and February. Many of our folks with diabetes come in for all kinds of reasons. We cannot forget that this is a very important part of their whole regimen. Use reminders and recalls as well because that sometimes can help as well.

Slide 27, another recommendation from the National Foundation for Infectious Diseases on how to increase the vaccination rate in people with diabetes. Whole vaccine-only clinics. We see this with many of our partners such as the drugstores and worksites. You and your office sometimes can have a vaccine-only clinic.

Continue vaccination also into December, January and beyond. Somehow people think if they didn't get their vaccine in October that they shouldn't get it. No. We want people to continue getting their vaccine and also maybe having standing orders to vaccinate anyone with diabetes can also be an effective of increasing the uptake of the vaccine. The next message is antiviral medication therapy.

Last week on one of the COCA calls, there was an entire call on the antiviral medication and you can also find that on the COCA Website but people with diabetes are prime candidates to receive antiviral medication if they develop symptoms of influenza.

You should not wait for lab test confirmation. It's not necessary and please remember that the antiviral drugs are most effective when started within 48 hours of the onset of symptoms so every minute counts.

When you are giving your folks a flu shot, talk to them about this as well and of course clinical judgment is very, very important but please understand that

antiviral medications do not replace the flu shot. This is just if a person does get sick to help to prevent more complications.

The primary medications include Tamiflu and Relenza. They're active against both Influenza A and B viruses. You know, the side effects, the most common side effects can be some nausea and as I said before, chemoprophylaxis with antiviral is not a substitute for the influenza vaccine.

Slide 30 goes to other message, the sick-day rules. Any person with diabetes should know what to do if he or she gets sick. It could be any type of illness, not just the flu but they need to make a plan.

They need to know that they should keep on taking the usual dose of pills or insulin to monitor their blood sugars on a regular basis. Many people say oh, I'm not eating and I'm sick; well, I don't have to take my medication.

Very important to have a plan and to know what to do if the blood sugar levels go up or if they go down. Sometimes people may need more or less insulin so to have a plan is very, very important.

If a person cannot eat their usual diet, it is still very important to avoid dehydration so people need to have enough soft food or drink enough liquids to prevent dehydration.

Slide 31, we want people to drink extra calorie-free liquids, maybe in small sips. We want people to check their temperature every four hours. If their temperature's over 101, we want them to call the office. For people with Type 1 diabetes, to check the urine for ketones and definitely for blood sugars go above 250 to 300 to call the healthcare provider so that we can make changes in the regimen or have the patient come into the office or into the emergency

room and certainly these are folks who have symptoms. That would be the time to assess the patient for antiviral medication as well.

We also want people to follow healthy habits with hand washing, staying home when they're sick, etcetera, the everyday precautions. You can find all this information on Slide 32 on the cdc.gov diabetes Website.

We have all the sick-day rules and we do have the recommendations for insulin to vaccine so our messages are people with diabetes are at higher risk of complications.

Be sure they get the influenza shot, not the nasal mist. Be sure they at some point get a pneumonia shot. Make sure that they know about antiviral medications, sick-day rules and of course everyday precautions. Thank you very much and we'll go on to Anthony Brenneman who will talk about cancer. Thank you.

Anthony Brenneman: Thank you, Dr. Allweiss, and when I'm referring to the vaccine, I'm also going to only be referring to the trivalent inactivated influenza vaccine.

Immuno-compromised patients are not approved to receive the live attenuated influenza vaccine and at this time it's also felt that close family members should not receive the live attenuated vaccine although there's no direct correlation between the flu mist and transmission to these immuno-compromised patients due to their severe immuno-compromised state, it's felt that everyone should receive the trivalent inactivated vaccine.

And moving to Slide 34 as way of background the mortality rate in this group of patients is extremely high. It can reach up to 9% of those infected by flu which is four times higher than the general population.

There's also evidence that these patients that are hospitalized, 31% go on to need further skilled care, again a significant increase over the general population.

Evidence also exists that fewer than 50% of this patient population is vaccinated so it's incumbent upon us to be asking our patients whenever we see them and we know that they have cancer if they've gotten their flu vaccine and to encourage that they do so.

Influenza can result in secondary and more severe complications in this population, especially noting bacterial pneumonia's, worsening of chronic, respiratory and cardiac conditions can occur.

It is a universally well-tolerated vaccine in this population compared to the general population, and they have just like the general population transient symptoms of one local muscle soreness, myalgias and arthralgias but serious complications are extremely rare so therefore the benefit in this group of patients significantly outweighs the risk.

Slide 35, just some general signs and symptoms in these patients. They present much like the general population with fevers, myalgias and constitutional symptoms.

The challenges come because their diseases sometimes present with the exact same kind of findings, of fevers and myalgias, as well as treatment from their chemotherapy. So sometimes the flu is masked to the patient and to the care provider so we need to maintain a high level of suspicion and start our patients on antiviral medications early on.

We can make the diagnoses by using the nasal saline wash with the quick viral detection method but having a negative outcome doesn't preclude treatment so we should go ahead and start those treatments early on as Dr. Allweiss had indicated in her discussion.

Slide 36, I'm going to proceed through talking about different cancer patients based on different population groupings. There's some prior studies that have led providers to be concerned that maybe the viral load isn't enough to protect these patients and so I am going to talk through some of the findings and why that might be.

So I'm going to start with Slide 37 in the pediatric population, clearly there's a higher incidence of influenza within this group of patients which leads to a greater morbidity and mortality.

The challenge also is if these patients develop influenza, it can interrupt or delay their therapy up to 80% of the time which have long-term sequelae and poor outcomes for these patients.

Our studies indicated that maybe the vaccination was associated with a suboptimal immunogenicity within these groups. When they looked at the groups a little bit more closely though, they did note that all of these patients were mounting an immune response. It may have been not up to the level of the general population.

Some of these patients may be responding to one or two of the viral strains within the trivalent vaccine or their total sero titer weren't as high as the general population, but they do note that they have responded at some level.

This was found in the 2009 Cochran Review which showed the efficacy for the antiviral medication in the pediatric setting as well as its excellent safety profile. So here they are recommending routine vaccination.

There is a timing issue within this population as in all of the adult populations and I'll be talking about that towards the end of this discussion. Moving to Slide 38, adults with solid tumors, these patients demonstrate an ability to mount protective antibody titers.

When we look at those studies, it is notable that most of the patients that receive the vaccine and responded weren't receiving treatment at the time although some of the patients within the studies were receiving chemotherapy at the time of vaccination and they did demonstrate seroconversion.

Based on that in a study by Earl, they demonstrated a decreased rate of influenza in these patients that have been immunized, as well as decreases in delays for treatment, and decreases in morbidity and mortality in the vaccinated groups.

On Slide 39, patients with hematologic malignancies, initial studies were showing that these patients didn't respond as well as healthy controls or patients with solid tumors and some thought that this may have been related to the disease types since it was directly affecting their immune systems.

However, when they separated out the patients that were not receiving chemotherapy at the time of vaccination, they did note that these patients responded equivalently to the controls that they were compared to. That suggests that the treatment itself was causing a decreased response and not the disease.

Two studies that have shown this, one on lymphoproliferative disorders found that 60% of those patients developed seroprotection to all three viral strains which compared favorably to the controls at 80% and only one patient in the treated group ended-up with a case of influenza.

Another study with patients with hematologic malignancies were vaccinated during active treatment showed that they were able to mount significant responses compared with their prevaccination baseline and despite a local epidemic outbreak in that area, none of those patients developed the flu.

On Slide 40 it may indicate the discrepancies in this way, another reason that we see these discrepancies in some of the studies. Typically the general population takes two to four weeks to respond to the vaccination when we're looking at seropositive levels.

In a study by Mazza and Yale looking at non-Hodgkin lymphoma patients, it may take this group of patients up to 12 weeks to seroconvert and be able to have enough protection to prevent the flu from occurring.

These same individuals went on to look at long-term response in this group of patients and found good reactions one and six months out as well as following-up over two consecutive flu seasons.

Moving to Slide 41 and talking about patients with the hemopoietic stem cell transplants, there is some data that's limited by a lack of uniformity in the timing of vaccination relative to the transplant itself.

That's because centers that do hemopoietic stem cell transplants have different times that they recommend vaccinating patients so there's variability across the nation in that. And then also the numbers are lower so they combine

autologous and allogeneic bone marrow transplants together to come up with recommendations.

And what we have found is that the auto autologous transplant patients, those receiving their own stem cells and the allogeneic patients receiving someone else's marrow have different response times to the vaccine. But larger studies have demonstrated evidence of efficacy and a protective effect from this intervention.

When we looked again in this population, timing is crucial. For the autologous transplants, we start to see seropositive conversion about three months out from transplant with good conversions at about six months out from transplant.

For those with an allogeneic bone marrow transplant receiving someone else's marrow, they start converting at about six months but with good conversion at about one year out from transplant. So vaccine is recommended in this population as well.

On Page 42, Slide 42, we're talking about the immunotherapy and biological agents. Clearly a strong advancement in cancer therapies and one of the drugs that's most often used is rituximab which is integral in the treatment of B cell lymphoproliferative disorders.

Rituximab causes an induced B cell depletion by complement-dependent and antibody-dependent cellular cytotoxicity. Recovery of these proliferal blood B lymphocytes begins six months after treatment and does not return to pretreatment levels for up to one year.

This possibly causes a decrease in acquired immunity via inhibition of memory B cells and may explain why some of these studies are mixed, some recommending treatment and others not because it may have been when the vaccine itself was given, there's no signs or recommendations against vaccinating these patients.

There's been no adverse outcomes so we're recommending that these patients also receive the annual flu vaccine. So if we go to 43, I've mentioned timing as a key within the cancer population.

The recommendations are to vaccinate two weeks before initiation of chemotherapy or if you're not able to do that to wait until the white count recovers to greater than 1.0 on the CBC. If that's not able to be done, two months after completion of chemotherapy or before each flu season is recommended for these patients.

Finally for actively-treated patients, vaccinating the furthest possible time point away from treatment during a given cycle is recommended. So for instance, a typical cancer cycle may be every four weeks for the chemotherapy so vaccinating between Weeks 2 and 3 after the chemotherapy is given is the most optimal time point and if the white count is above 1.0.

Slide 44, like our other groups of patients, close contacts are underutilized in getting their vaccinations. Less than 45% among family members of cancer patients are getting vaccinated, so again we want to encourage that at every step and every chance that we can get.

Going to Prevention - Slide 45, treatment. Clearly prevention is the best way to prevent and to keep our cancer patients safe. Use of pneumococcal vaccine

is recommended but if these patients do develop flu, use of anti-influenza and antiviral agents.

Most oncologists are recommending a combination of the neuraminidase inhibitors and adamantine in these severely-immuno-compromised patients.

So in conclusion, clinically it's noted that immunized patients even with lower response rates do better than their non-immunized comparisons. The majority of patients who have not received treatment for greater than 30 days can mount immunologically-favorable reactions to vaccine. Vaccinating the furthest time point from treatment appears to be the most preferential, and vaccinating patients with cancer is safe, minimally invasive and inexpensive.

So at this time I will turn it over to Kerri Holloway who will talk about chronic kidney disease.

Kerri Holloway: Thank you very much and if you will go to Slide 47, that's where we'll start. Today I'd like to share some information on chronic kidney disease, a population that's vulnerable to the influenza. In addition, I have some slides that I will be sharing with you.

It's important to understand how the flu affects certain population of patients as you have heard on the previous presentation. One such population of patients is the chronic kidney disease population.

Influenza vaccination rates in the general population have been associated with improved outcomes, yet high-risk populations such as CKD patients have received little attention in determining the potential benefits.

I will discuss why vaccination is important, the impact of influenza on this population and recommendations for the flu vaccine. If you go to Slide 48, it's estimated 10 to 20% of the U.S. population is infected with influenza yearly.

It's estimated that the flu was responsible for an average of 226,000 influenza-related hospitalizations during the years 1979 to 2001 and about among those were greater than 65 years of age and there was an estimated annual average of approximately 36,000 deaths during the years 1990 through 1999, more than 90% in adults greater than 65 years.

Patients with CKD ESRD are likely to be at high risk to influenza infection and complications given their altered immune status. In addition, infectious disease is the second-leading cause of death among the CKD ESRD patients and pulmonary infectious mortality is ten-fold higher in this population than in the general population especially among the aged and those with increased comorbidities.

CKD is among the comorbid conditions and an increased risk of influenza complications. If you'll go to Slide 49, in 2005 approximately 485,000 people received renal replacement therapy, 340,000 of who were receiving maintenance dialysis.

It is projected that there will be approximately 710,000 in-stage renal disease patients by the year 2015. Potential risk factors for infection among patients with CKD ESRD include advanced age, high burden of co-existing illnesses, hypoalbuminemia, immunosuppressive therapy, nephrotic syndrome, uremia, anemia and malnutrition.

These risk factors make contribute to contributions in this patient population such as pneumonia, CNS complications and death with infection the second-leading cause of death.

With a projected number of patients greater than 700,000, greater efforts are need to identify potentially modifiable risks to decrease the burden on patients, families and the healthcare system.

Slide 50. CKD ESRD patients are immuno-compromised and are at a higher risk for infection because these patients are sicker, often with dysfunctional immune systems.

A CKD patient has a greater disease burden including cardiovascular, infectious, inflammatory and uremic conditions. They have increased susceptibility for infection, decreased response to vaccination, and decreased maintenance of protective antibodies.

Some implications to consider are the results of studies in the general population do not always apply to CKD patients. The vaccines may need to be evaluated individually. The risk and benefits including cost issues need to be weighed and there is a great need to prevent infection in the ESRD population.

Number 51. Vaccination is associated with decreased likelihood of hospitalization and mortality compared with patients who are not vaccinated. All CKD patients should receive an annual influenza vaccination because of the virulence and risk associated with influenza virus and vaccination infection.

Vaccination may prevent infections which contribute to decreased coinfections or superimposed infections, decrease disease burden and hospitalization and decreased severity of illness for breakthrough infection.

In addition the likelihood of an acute myocardial infarction has been shown to decrease when patients are vaccinated, an important consideration given the high risk for cardiac events in the ESRD population.

Fifty-two [slide]. Infection is the leading cause of death in patients with ESRD. Numerous risk factors predispose patients with CKD and ESRD to infection. As discussed in an earlier slide, these include advanced age, high burden of coexisting illnesses, uremia, anemia and malnutrition.

In addition, infection-related hospitalization contributes substantially to excess morbidity and mortality in patients with ESRD making infection the leading cause of death in this patient population.

Number 53 Among Medicare beneficiaries aged 66 years, patients diagnosed with CKD seem to have substantially higher rates of hospitalization for diagnoses of pneumonia (insepsus) compared with patients without diagnosed CKD.

In addition to an increased incidence of being hospitalized with infection, patients with CKD have longer links of hospital stay during infection-related admissions compared with patients without CKD. Admissions are predominantly due to cardiovascular disease and infection.

Fifty-four. Influenza infections are associated with thousands of deaths every year in the United States with the majority of deaths among adults greater than

65 years of age. More than 30,000 adults 65 years or older die each year from flu-related complication during the years 1990 and 1999.

Fifty-five, because CKD and ESRD patients are immuno-compromised, they represent a high-risk group for developing infectious disease despite that there has been a slow increase in the number of CKD and ESRD patients vaccinated.

The number of patients vaccinated may be underestimated as many patients receive vaccination outside the dialysis center and these numbers may not be always captured.

Vaccination was significantly associated with a decrease for risk for any cause death and cause-specific death in hemodialysis. It's important that all kidney patients get the proper immunization as part of their essential care.

Slide 57 Vaccination for influenza reduced hospitalization risk for pneumonia for influenza by 27% in the community-dwelling patients 65 or older. The rates of reported influenza vaccinations continue to improve overall reaching 62.4% in 2008 though they remain noticeably lower in children than in adults.

As this slide demonstrates, rates in adults increased to 5.19, 60.4, 60.6 and 70.9% respectively for those aged 20 to 44, 45 to 64, 65 to 74 and 75 and older. In 2008 rates in white, Native American, Asian and Hispanic patients ranged between 61 to 64-and-a-half percent while the rate for African-Americans was slightly lower at 58.9%.

These rates should be interpreted with caution as patients may be vaccinated through non-Medicare programs and this information comes from the U.S. RDS data system.

Slide 58. The CDC as mentioned before recommends that all persons get the influenza vaccination, specifically those patients with chronic medical conditions that make them more likely to have complications with influenza should get an annual vaccination.

In addition to CDC, the Centers for Medicare and Medicaid Services considers influenza vaccination as a component of quality assessment and performance improvement for the ESRD population.

The 2010-2011 trivalent vaccine contains the influenza A or the H1N1 vaccine virus derived from the 2009 pandemic virus and it does not require two separate injections.

Slide 59. Studies have proven that getting all the proper immunizations can prevent illness and decrease the need for hospital stays. The influenza vaccination has shown a five to 15% reduction in hospitalization for pneumonia, influenza and up to a 7% reduction in all-cause hospitalizations.

There has also been a 15 to 36% reduction in death from infections and a four to 14% reduction in death risk for all causes. Since people on dialysis are at a higher risk for infection, it makes sense that getting the proper vaccinations can prevent illness.

Among the aged and those with increased comorbidities, influenza vaccination decreases the likelihood of hospitalization, mortality and cost.

Slide 60. The vaccination rate in the CKD ESRD falls well below targets for the general population and is consistent with influenza rates previously

reported in the United States renal data system 2000 and the 2001 annual data report while vaccination rates have been climbing in the general population.

Vaccination for influenza reduced death risk by 48% in community-dwelling patients aged 65 and older. By modality, influenza vaccination rates are highest in hemodialysis patients at 67% compared to 61.8% and 46.1% in the peritoneal dialysis and the transplant patients.

In conclusion, the risk for acute infections seem to occur more frequently in the setting of kidney disease and is associated with poor outcomes compared with the general population.

With the number of CKD patients rising, the cost to the Medicare system is projected to be at \$54 billion by 2020. Annual influenza vaccination is the best way to reduce the risk of complications from influenza infections and reduce some of the burden on the Medicare system.

Quality improvement programs focused on influenza vaccination rates are needed to address this vulnerable population of patients. Thank you.

Loretta Jackson-Brown: Thank you to all the presenters for providing our COCA audience with such a wealth of information. We will now open up the lines for the question-and-answer session.

Coordinator: Thank you. If you would like to ask a question, please press star 1. Please be sure to unmute your phone and clearly record your name when prompted. Again that's star 1 to ask a question and we will allow a few moments for any questions to come in. Again that's star 1 for a question. I show no questions at this time.

Loretta Jackson-Brown: I would ask our presenters if they have anything else that they would like to recap or perhaps emphasize their take-home message for the audience.

Pamela Allweiss: This is Pam Allweiss. I think one point was made about folks with cancer and their family members that the people around them should possibly get the inactivated vaccine as well.

For people with diabetes, their family members or caregivers can get the nasal mist unless that person themselves has a condition such as diabetes or cancer or chronic kidney disease that would say that he or she should get the shot, not the nasal mist.

But if it's a young healthy person who is around or taking care of somebody with diabetes, that person may get the nasal mist if the person does not have a condition that would require the shot so that's a little bit different.

People with diabetes are functionally immune-suppressed but not to the extent as folks who may have cancer and chemotherapy so I wanted to bring up that point. I was very glad that it was brought up about what type of vaccine the caregivers and family members should get so with diabetes it's a little bit different.

Loretta Jackson-Brown: Thank you, Dr. Allweiss.

Coordinator: Excuse me, we do have one question. Would you like to take that?

Loretta Jackson-Brown: Please.

Coordinator: Okay, it's Jacquelyn Butler. Your line is open.

Jacquelyn Butler: Yes, I was interested in finding out, you gave the data for 2008 of the percentage of people receiving influenza. Now where would I go for 2009 because I'm trying to in our community go into the African-American community and try to educate them more and get the influenza vaccinations.

So I would like to be able to capture those numbers from that data that you received and I'm able to.

Joe Bresee: Yeah, this is Joe Bresee from CDC Flu Division. We do coverage surveys to figure out how much vaccine is used in different populations each year in a few different ways. A lot of that data is on our Website if you go to cdc.gov and migrate to the influenza Website, there'll be some areas that talk about influenza vaccine coverage and you can check there.

If not, you can send me a note at jsb6@cdc.gov and I can find the information you need.

Jacquelyn Butler: Okay, thank you.

Loretta Jackson-Brown: And a reminder that you can also e-mail us at coca@cdc.gov as well.

Joe Bresee: Oh yeah, better yet in fact because the coverage data are actually not in my group but we can find it for you.

Coordinator: I have no other questions at this time.

Loretta Jackson-Brown: On behalf of COCA, I would like to thank everyone for joining us today with a special thank you to our presenters, Dr. Bresee, Dr. Allweiss, P.A. Brenneman, and R.N. Kerri Holloway.

If you have additional questions for today's presenters, please e-mail us at coca@cdc.gov. Put the presenter's name in the subject line of your e-mail and we will ensure that your e-mail is forwarded to him or her for a response.

Again that e-mail address is C-O-C-A at C-D-C dot G-O-V. The recording of this call and the transcript will be posted to the COCA Website at emergency.cdc.gov/C-O-C-A within the next few days.

Continuing education credits are available for this call. Those who participated in today's COCA conference call and would like to receive continuing education credit should complete the online evaluation by January 10, 2011 using course code EC1648. That is E as in echo, C as in Charlie and the numbers 1648.

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Thank you again for being a part of today's COCA conference call. Have a great day.

Coordinator: Thank you for your participation today. You may disconnect at this time.

END