Testimony before the

Committee on Energy and Commerce Subcommittee on Oversight and Investigations

United States House of Representatives

U.S. Public Health Preparedness for and Response Efforts to Seasonal Influenza

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For Release upon Delivery

March 8, 2018

Expected at 10:00 a.m.

Good morning Chairman Harper, Ranking Member DeGette, and Members of the Committee. I am Dr. Anne Schuchat, Acting Director of the Centers for Disease Control and Prevention (CDC) and Acting ATSDR Administrator. I want to thank the Committee for the opportunity to provide an update on the current influenza (flu) season and for bringing attention to this ongoing and very serious public health threat. CDC works collaboratively with our colleagues in other components of the Department of Health and Human Services to protect the nation's health. I and the CDC leadership team are committed to ensuring that CDC will continue to conduct critical science, provide health information and act quickly to protect our nation through the control and prevention of disease, injury, and disability in the United States and globally.

At CDC we have spent decades building the surveillance and diagnostic capacity to rapidly detect, prevent and respond to annual influenza epidemics, and emerging novel and pandemic influenza threats. Seasonal and pandemic influenza prevention and response are inextricably linked, as preparedness for seasonal flu ensures preparedness for an influenza pandemic. CDC leads efforts that span from detection of influenza to protection against the ever-changing virus. Our systems provide the scientific basis for vaccine virus selection – for each year's seasonal flu vaccine as well as for pandemic vaccine stockpiling. We diligently monitor for genetic changes in the flu virus, and identify how those genetic changes affect disease transmission and severity. We build public awareness and provider knowledge about prevention methods and early treatment with antivirals, and support public sector delivery of routine and emergency immunizations. Throughout each season, we monitor both the safety and effectiveness of influenza vaccine, and today I will provide some more information specifically about our systems to monitor vaccine effectiveness and highlight some of the work we are doing to improve vaccines. We are better prepared than we have ever been to detect, prevent, treat, and respond to influenza; however, despite the progress we have made in fighting the flu, seasonal influenza viruses constantly change and are adept at outfoxing our immune systems. It is critical that we deepen our

understanding of influenza and use this knowledge to make near-term improvements to influenza vaccines.

This year's influenza season has been challenging across the United States, and has been heartbreaking for families who have lost loved ones. Every year influenza causes significant burden in this country with many millions of Americans becoming ill, hundreds of thousands of them requiring hospitalization, and tens of thousands dying.

The 2017-2018 influenza season has been a severe one. Flu activity began to increase in early November and then increased rapidly from December through early February. This season, the levels of influenza-like illness, which is a measure based on outpatient visits and emergency department visits, reached levels as high as at the peak of the 2009 H1N1 flu pandemic. Unlike in other seasons when flu activity varied in timing and intensity across states, during this 2017-2018 season, many states experienced widespread and high flu activity at the same time. We cannot predict how long this season will last, and while we have started to see a decline in rates of people visiting their doctor for influenza-like illness, we expect to see several more weeks of ongoing flu activity, with continued reports of hospitalizations and flu deaths in children and adults.

The majority of people with influenza so far this season have been infected with the H3N2 influenza virus. During H3N2 predominant seasons, we see more cases, more visits to the doctor, more hospitalizations, and more deaths, especially among older people. It is still too early to assess the full burden of influenza disease for this year, but estimates from recent seasons where H3N2 was predominant, like the 2012–13 and 2014–15 seasons, provide an indication of what to anticipate for this season. CDC estimated that during seasons like those, influenza accounted for as many as 35.6 million illnesses, 16.6 million medically attended visits, 710,000 hospitalizations, and 56,000 deaths.

CDC recommends a yearly flu vaccine for everyone six months of age and older as the most important step in preventing influenza infection. Flu vaccines protect against three or four different flu viruses. Three-component vaccines contain an H3N2, an H1N1, and a B virus. Four-component vaccines have an additional B virus component. Unfortunately, flu vaccines do not usually work as well against H3N2 viruses; however, even with reduced vaccine effectiveness, vaccination can prevent flu deaths, illnesses, medical visits, and hospitalizations. Among flu-associated pediatric deaths in the United States from 2010 to 2016, 78 percent of children who died had not been fully vaccinated.

The influenza vaccine production process requires that virus strains be selected in February of each year for vaccine that will be used to protect Americans in the fall. Throughout the year, CDC studies thousands of flu viruses in our laboratory to evaluate whether the currently circulating flu viruses have changed, or drifted, over the months since selection of the virus strains. So far this season, we are not seeing significant drift in the currently circulating viruses, including the H3N2 viruses that are predominating.

Where we are seeing differences is when we compare the vaccine viruses prepared for manufacturing egg-based influenza vaccine to those that are currently circulating. These differences are notable for the H3N2 viruses; unfortunately, the adaptation to growth in eggs makes the H3N2 vaccine viruses less similar to the circulating wild-type H3N2 viruses in the community. These egg-adapted changes are likely one of several possible contributors to the relatively lower vaccine effectiveness typically seen against H3N2 viruses compared with H1N1 or influenza B viruses.

CDC has developed and maintains the nation's system for monitoring the effectiveness of influenza vaccines. This network's routine data inform recommendations on vaccine use, selection of new viruses for updating the vaccines, communication to the public, and sharing important information for manufacturers regarding the performance of their vaccines. In February, CDC published its interim estimates for this season's vaccine effectiveness (VE). CDC found that vaccination this season has

reduced the risk of having to go to the doctor for flu by 36 percent so far, and that flu vaccine is offering substantial protection against H1N1 flu (67 percent) as well as moderate protection against flu B viruses (42%). Vaccine effectiveness against this season's dominant H3N2 viruses is about 25 percent, similar to what CDC expected at the beginning of the season. These results are also similar to the final U.S. vaccine effectiveness estimates of 32 percent against H3N2 viruses reported last season (2016-2017). Importantly, the vaccine offered better protection against H3N2 for children six months to eight years old, with estimated effectiveness of 51 percent. Overall, the vaccine is 59 percent effective against both influenza A and B in children six months to eight years of age.

Over the last three years, CDC has significantly improved our global surveillance and characterization of influenza viruses in support of more effective vaccines. Globally coordinated epidemiologic and virologic surveillance is the foundation of the influenza vaccine virus selection and development process. The World Health Organization (WHO) Global Influenza Virus Surveillance and Response System (GISRS) is a global network that provides year-round surveillance of influenza viruses. Within GISRS, CDC serves as one of five Collaborating Centers that receive and characterize thousands of influenza viruses each year. CDC has expanded domestic and global disease surveillance and laboratory detection capacity to support improvements in vaccine virus selection and in flu vaccine effectiveness. CDC contributes a large amount of data for both the U.S. and global viruses, and is an innovator in new methods for the stain selection process. Key activities include partnerships with more than 50 Ministries of Health and other health agencies to strengthen global influenza surveillance, develop new technologies, such as next-generation sequencing, to analyze and characterize flu viruses more quickly, and to increase the number of egg-derived viruses CDC produces to expand options for suitable vaccine development.

Still, more can and needs to be done to support development of better vaccines. CDC continues to support the long-term goal of developing longer-lasting, more broadly protective "universal" influenza vaccines in collaboration with HHS agency partners, and to focus on incremental vaccine improvements that would provide better tools to prevent influenza. Until better vaccines are available, CDC focuses on optimizing use of the currently available vaccines.

Thank you for the opportunity to talk about CDC's role in the 2017-2018 influenza season. I am happy to answer any questions you may have.