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U.S. Public Health Response to the Measles Outbreak

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INTRODUCTION

Good morning Chair DeGette, Ranking Member Guthrie, and Members of the Committee. I am Dr. Nancy Messonnier, Director of the National Center for Immunization and Respiratory Diseases at the Centers for Disease Control and Prevention (CDC). Thank you for the opportunity to testify before your Subcommittee on this important topic.

It has been said many times that vaccines are one of public health's greatest achievements. The immunization of children in the United States (U.S.) has prevented hundreds of thousands of deaths, contributed to longer life expectancy, reduced health disparities, improved quality of life, and saved trillions of dollars in societal costs. Immunizations are safe and effective and have become a routine part of how we care for our children. CDC estimates that one percent of children in the U.S. receive no vaccines at all. Despite this low percentage of unvaccinated children, vaccine-preventable diseases continue to be a threat to the health of our communities. In 2018, CDC provided technical support to nearly 300 vaccine-preventable disease (VPD) investigations and conducted nearly 2,000 laboratory tests in support of these investigations. Why do VPD outbreaks still occur despite record-high vaccination coverage rates and near-record lows of most VPDs? Small numbers of cases can lead to the re-emergence of VPDs if there are increasing numbers of unvaccinated people, leaving communities susceptible to outbreaks of these preventable diseases. At particular risk are those who cannot get vaccinated because they are too young or have specific health conditions. While confidence in vaccines remains consistently high at the national level, there are pockets of people who are vaccine-hesitant, who delay or refuse to vaccinate themselves and/or their children. The World Health Organization named vaccine hesitancy as one of the top ten threats to global health in 2019.

Vaccine hesitancy, in general, is rooted in misinformation about the risk of disease and the safety and efficacy of vaccines. However, the specific issue fueling the hesitancy often varies by community. For some, it could be that, fewer and fewer doctors, other healthcare providers, and parents have witnessed the serious and sometimes life-threatening consequences of VPDs. Parents may wonder if vaccines are really necessary, and they may believe that the risks of vaccinating infants or temporary discomfort a vaccine may cause outweigh the

benefits of protecting them from infection. For some, they question whether vaccines are safe, or whether they contain harmful ingredients. Others have religious beliefs that dissuade them from seeking medical care, including vaccination. Regardless of the reason for an individual's hesitancy, CDC's goal is to improve vaccine coverage rates, including by communicating the benefits and safety of vaccines, so that Americans can protect themselves, their family members, and others in their community from all VPDs.

Measles

The recent measles outbreaks in the U.S. provide an excellent example of our continued vulnerability to VPDs. Measles is a highly-contagious respiratory disease caused by a virus. It spreads through the air through coughing and sneezing. After an infected person leaves a location, the virus remains infectious for up to two hours on surfaces and in the air. It spreads so easily that if one person has it, 90 percent of the people close to that person who are not vaccinated or otherwise immune will also become infected. Since the 1960's, there has been a safe and highly-effective vaccine to prevent measles. One dose is approximately 93 percent effective at preventing measles; two doses are approximately 97 percent effective. Before the U.S. measles vaccination program started in 1963, approximately three to four million people in the U.S. got measles each year; 400–500 of them died, 48,000 were hospitalized, and 4,000 developed encephalitis because of measles. In the United States, widespread use of the vaccine has led to a 99 percent reduction in measles cases compared with the pre-vaccine era.

Because of a highly effective vaccination program and a strong public health system for detecting and responding to measles cases and outbreaks, measles was declared eliminated from the U.S. in 2000. Despite elimination status in the US, because measles continues to circulate in many other countries, with nearly 175,000 reported cases occurring worldwide annually, outbreaks can occur in the U.S. when unvaccinated groups are exposed to imported measles virus. Between 2000 and 2018, a range of 37 to 667 measles cases per year were reported in the U.S. with most of these originating outside the country. Importations of measles remain a significant challenge. Unvaccinated U.S. residents traveling overseas are at risk for measles, and

returning unvaccinated U.S. residents and foreign visitors to the U.S. may develop measles and expose unvaccinated people in the U.S. When measles gets into communities of unvaccinated people in the U.S., outbreaks are more likely to occur. Research has found that people who seek personal belief exemptions for their children often live near one another, which could make it difficult to control the spread of measles and increase the chance of the virus re-establishing itself in our country again. In addition, unvaccinated people put others at risk who cannot get vaccinated because they are too young or have specific health conditions.

High measles vaccine coverage and rapid public health response are critical for preventing and controlling measles cases and outbreaks. While overall measles vaccination coverage rates are high at 92 percent, one in 12 children in the United States are not receiving their first dose of measles-mumps-rubella (MMR) vaccine on time, increasing measles susceptibility across the country. In addition, we see considerable variability in coverage across states. In 2017, there were 11 states where more than 10 percent of toddlers had not received even a single dose of MMR vaccine. Within states, some counties or communities have much lower vaccination rates than the state average.

From January 1 to February 21, 2019, 159 individual cases of measles have been confirmed in 10 states. The states that have reported cases to CDC are California, Colorado, Connecticut, Georgia, Illinois, Kentucky, New York, Oregon, Texas, and Washington. Infected people can expose others in a variety of settings, such as school, daycares, emergency departments, outpatient clinics or airplanes. Frontline public health workers and clinicians across the country are following up on suspected measles cases in light of the recent outbreaks. These public health workers and clinicians are part of an enormous public-private partnership that protects health and saves lives through the nation's immunization system.

Overview of U.S. Immunization Policies and Programs

CDC's national immunization recommendations currently provide guidance for the prevention of 17 VPDs across a person's life span. CDC's immunization program plays a fundamental role in achieving national immunization goals and sustaining high vaccination coverage rates to prevent death and disability from VPDs. CDC's

Immunization program includes the Vaccines for Children (VFC) entitlement program, and CDC's discretionary Immunization program.

VFC is one of the largest and most successful public-private partnerships. Celebrating its 25th anniversary, VFC was created by the Omnibus Budget Reconciliation Act of 1993 and implemented in 1994 as a new entitlement program. It allows eligible children to receive recommended vaccinations free of charge as part of routine care, supporting the reintegration of vaccination and primary care. The VFC program serves children through 18 years of age without insurance, children eligible for Medicaid, American Indian/Alaska Native children, and underinsured children who receive care through Federally Qualified Health Centers or Rural Health Clinics. CDC purchases vaccines to distribute to VFC-enrolled providers by funding 61 eligible grantees for VFC-related operations activities. Currently, there are more than 44,000 public and private providers in the VFC program, and VFC purchases and distributes over half of all doses, across all routinely-recommended vaccines administered in the United States to those 18 years and younger. VFC has been instrumental to achieving high vaccination coverage rates and reducing disparities.

The discretionary immunization program was enacted in 1962 through the Vaccine Assistance Act, or section 317 of the Public Health Service Act. Over its 50-year history, the Program has played a critical role in helping to achieve national immunization goals by supporting the essential public health workforce and systems at the national, state, and local levels that protect all Americans, regardless of health insurance status, from disability and death from VPDs. These include proper vaccine storage and handling; management of vaccine shortages; and provider education on the vaccine schedule for people across the life span. To implement the discretionary program, CDC works collaboratively with 64 grantees, comprised of the 50 states, six large cities (including the District of Columbia), five territories, and three Pacific Freely Associated States.

In addition, the discretionary program is responsible for investments that strengthen the evidence base for our immunization policies and practices. The program supports disease surveillance, laboratory capacity, and scientific studies to evaluate vaccine effectiveness, safety, and program impact. The program supports the

nation's ability to maintain public health preparedness for a response to a vaccine-preventable emergency, such as a pandemic or biologic attack. The program also purchases routinely recommended vaccines to protect at-risk and vulnerable populations not eligible for immunizations through the VFC Program and to meet urgent public health needs, such as controlling VPD outbreaks.

Scientifically-based vaccine policies are a foundation of the U.S. immunization system. In the U.S., the Advisory Committee on Immunization Practices (ACIP) advises the CDC on national vaccine policy for preventing infectious diseases in the civilian population. The immunization systems and expertise supported by CDC's immunization program make substantial contributions to the evidence base that informs immunization recommendations made by ACIP. The ACIP makes recommendations based upon data about the burden of disease, safety and efficacy of vaccines, economic analyses, including cost-effectiveness data, and information about other factors such as how recommendations can be implemented by the health care system in conjunction with other recommended vaccines.

Once adopted by CDC, the Committee's recommendations establish the standard of practice for preventing VPDs. The Affordable Care Act requires that vaccines recommended by ACIP be covered without cost to vaccine recipients by new private health insurance plans (along with other recommended preventive services). In addition to post-market surveillance conducted by the CDC and the Food and Drug Administration (FDA) for FDA- licensed vaccines, the ACIP continues to review the safety and effectiveness of vaccines after they are recommended, and updates recommendations as more data become available. New data are reviewed in the context of the risks of adverse effects and the benefits provided by the vaccine.

Investments in CDC's Immunization program have improved the health of Americans. Coverage for many childhood vaccinations are at, near, or above 90 percent, and reported cases for most VPDs have decreased by 90 percent or more in the United States with the introduction of vaccines. Immunization continues to be one of the most cost-effective public health interventions. For each dollar invested in the U.S. childhood immunization program, it is estimated that there is $10 of societal savings and $3 in direct medical savings. From 1994 to

2016, the childhood immunization program has been estimated to prevent 381 million illnesses, 855,000 deaths, and nearly $1.65 trillion in societal costs. CDC's support of national, state and local programs has dramatically improved access to vaccination for all children and put systems in place to detect and respond to outbreaks of VPDs and to monitor vaccine effectiveness and safety.

Challenges

While overall vaccination rates remain high, there continue to be challenges in preventing VPDs. The majority of parents believe in the benefits of immunization and have their children vaccinated; however, CDC is aware that there are certain concerns that lead some parents to delay or refuse vaccinations. CDC has conducted research to better understand why some parents choose not to vaccinate their children. There are many reasons parents give for their vaccine hesitancy despite consistent scientific evidence that vaccines are safe and effective. For some, many VPDs do not have the visibility they once had and many parents question whether the vaccines are more dangerous for their child than the disease they prevent. Parents also have access to conflicting and often inaccurate information about vaccines via the Internet, and others express concern that there are too many vaccines. Before 1985, the recommended immunization schedule included seven vaccines. Today, we can protect children younger than 2 years of age from 14 potentially-serious diseases with vaccines.

Maintaining public confidence in immunizations is critical to preventing declines in vaccination coverage rates and outbreaks of VPDs. CDC monitors the safety of vaccines by performing high-quality vaccine safety research; determining whether vaccines cause reactions in certain cases and helping to learn about preventable risk factors; and, identifying vaccine adverse events through public health surveillance. CDC also supports science-based communication campaigns and other efforts to convey the benefits of vaccines to the public to aid individuals in making informed vaccine decisions to protect themselves, their loved ones and their communities. CDC works with organizations, such as the American Academy of Pediatrics and the American Academy of Family Physicians, to educate healthcare providers about current immunization policy and clinical best practices to help them protect their patients and communities from VPDs. CDC has also developed a dynamic provider toolkit for

conversations with parents about vaccination that includes evidence-based strategies, print materials, and web-based tools.

While vaccine hesitancy tends to be a focus during times of outbreaks, there are also disparities in vaccination coverage that threaten the nation's ability to maintain high vaccination coverage. Most recently, CDC's national surveys that monitor vaccination coverage have identified that unvaccinated children are more likely to be uninsured, live below the poverty level, and live in rural areas. For example, vaccination coverage was 15-30 percentage points lower for children without health insurance compared to children with private health insurance and 3-7 percentage points lower for children living in rural areas compared to children living in urban areas. These disparities demonstrate gaps in reaching the most vulnerable children and suggest there may be logistical challenges faced by parents who want to get their children vaccinated, such as lack of transportation or lack of immunization providers within their community. CDC is undertaking additional research to identify the challenges these parents face, and to develop appropriate strategies to ensure these children are not left behind.

As the influenza season continues, I also want to mention our progress with childhood vaccination against influenza. CDC's early season estimates from November of last year indicated that 46% of children under age 18 years had received their flu vaccine. This is the highest early season coverage in 5 years and may indicate actions taken by parents in response to the severe 2017-2018 season. While this is encouraging news, end of season estimates typically show less than 60% of children receive their flu vaccine. Coverage varies widely by state and there are disparities in coverage similar to those previously mentioned - by insurance status, socioeconomic status, and by urban/rural status. Achieving high vaccination coverage and preventing pediatric deaths due to influenza is a priority for CDC. CDC is working with state immunization programs to help ensure ordering of enough VFC vaccine to serve their VFC eligible population. CDC is also encouraging states to use alternative venues, such as schools, for vaccinating children against seasonal influenza.

While coverage rates for most childhood and adolescent vaccines are high, coverage estimates for human papillomavirus (HPV) vaccination remain low, with only half of U.S. adolescents receiving all recommended doses of HPV vaccine. The annual national vaccination coverage estimate among teens for one dose of HPV vaccine has been more than 20 percentage points lower than the estimate for one dose of Tetanus, Diphtheria and acellular Pertussis (Tdap) vaccine, demonstrating that valuable opportunities are being missed to vaccinate against HPV. We know that HPV vaccine is safe and effective in preventing cervical and other forms of cancer. CDC is enhancing its efforts to support state and local immunization programs, and to partner with medical professional associations, cancer organizations, and other stakeholders to educate parents and clinicians on taking every opportunity to vaccinate adolescents. Collaborative efforts remain critical to promoting vaccination so that adolescents nationwide are protected against vaccine-preventable disease, including cancers caused by HPV.

Outbreaks of VPDs continue to be an ongoing challenge for the public health system. In addition, there have also been recent outbreaks of meningitis and mumps in university settings and other tight knit communities. Today, these outbreaks are an indicator of how globally interconnected we are, with measles importations uncovering those communities opting out of immunization, and indicating those communities may be getting larger. Ongoing surveillance is critical to detecting and responding to outbreaks quickly to prevent further spread of the disease and to understanding vaccine effectiveness and safety over time. CDC is committed to a strong evidence base to assure that national immunization policies and programs are protecting Americans and based on the best available data, continuously reviewed and updated.

Looking Forward

The U.S. has reached high coverage levels and achieved low incidence of most VPDs. The threat of VPDs remains, as the current increase in measles cases has shown us. The increase in measles cases should be seen as a wake-up call. Our public health system has risen to challenges in the past, and CDC is committed to keeping

measles and other VPDs from returning and threatening the health of our communities. CDC is committed to sustaining the enormous health and societal benefits that our immunization partnership has achieved.