

# CONNECTICUT MEDICAL ASSISTANCE PROGRAM DEPARTMENT OF SOCIAL SERVICES & HEALTH INFORMATION DESIGNS



## Connecticut Medical Assistance Program Quarterly Newsletter

The United States (U.S.) is experiencing the largest number of reported cases of measles since 1992. From January 1 – September 12, 2019, there have been 1,241 confirmed cases of measles in 31 states, with more than 75% of cases occurring within New York State.<sup>1</sup> Measles was declared eliminated from the U.S. in 2000 but, recently there has been a resurgence of cases.

The World Health Organization (WHO) recently published a list of the top threats to global health and vaccine hesitancy was among the top 10.<sup>2</sup> The WHO defines vaccine hesitancy as “the reluctance or refusal to vaccinate despite the availability of vaccines.”<sup>2</sup> While not all measles cases are due to vaccine hesitancy, it is a contributing factor to the increase in cases. Other contributing factors include: patient

complacency, barriers to vaccine access, lack of vaccine confidence, misconception about safety, low vaccination rates due to medical and non-medical exemptions, and international travel to countries with measles outbreaks.<sup>2,3,4</sup>

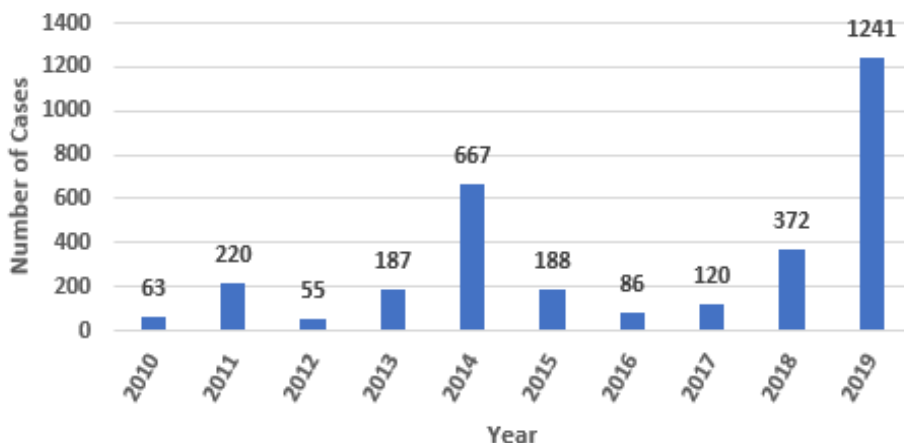
Most states within the U.S. allow exemption from vaccines for medical or religious beliefs. Connecticut is among those states that allow exemptions. In May of this year, the Connecticut Department of Public Health (DPH) released vaccination data for the 2017-2018 school year [Vaccination Exemptions](#) which shows the percentage of students within each school who have a medical or religious exemption to being vaccinated. Additionally, 2 patients enrolled in the CT Medical Assistance Program have been diagnosed with measles this year and, according

to a press release by DPH, 3 total cases were confirmed in CT for 2019 as of April.<sup>5</sup>

High levels of immunity are required to stop the spread and ultimately eliminate the measles virus. When immunity levels are high, outbreaks (defined as 3 or more cases occurring in a single community) tend to occur less and be shorter in duration. Herd immunity is defined as the portion of a population that is required to be immune in order to prevent outbreaks. Herd immunity is approximately 95% for the measles virus. Meaning that  $\geq 95\%$  of all people need to be immune in order to stop the spread of the virus to unvaccinated people. When local vaccination rates are lower than what is needed for herd immunity, outbreaks occur.<sup>6</sup>

Outbreaks of measles have been reported in the U.S. as far back as 1765 but, the virus didn't become a nationally notifiable disease until 1912<sup>7</sup>, requiring all probable and diagnosed cases to be reported to the National Notifiable Disease Surveillance System (NNDSS), overseen by the Centers for Disease Control (CDC).<sup>8</sup> Prior to vaccine availability in 1963, almost every child in the U.S. was infected with measles. Major epidemics occurred annually, infecting approximately 3-4 million people per year, leading to approximately 500 deaths and 48,000 hospitalizations annually.<sup>9</sup>

**Number of U.S. Measles Cases Reported by Year  
2010 - 2019\* (as of September 12, 2019)**



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In 1963, the measles vaccine was licensed in the U.S., and in 1966, the vaccine was added to the childhood immunization schedule. Measles infection declined dramatically after 1966, and in 1967, the CDC released its first call to eliminate measles from the U.S.<sup>10,11</sup> At about this time, data showed that measles vaccine coverage for children aged 1-4 years of age was < 65%.<sup>7</sup> Then, in 1971-1972, the St. Louis measles epidemic occurred which fueled the prediction that a 2-dose measles schedule was needed to achieve elimination of the virus.<sup>12,13</sup>

A second epidemic occurred during 1976-1977, and in 1978, the CDC responded with its second call to eliminate measles by October 1982.<sup>7,14</sup> A nationwide childhood immunization initiative was implemented, and by 1981, all 50 states required measles immunization (or history of disease) before initial school entry.<sup>15</sup> Measles, however, continued to occur in unvaccinated preschool aged children and in school aged children who had received a single dose of the vaccine. At about this time, data was showing that measles vaccine coverage by age 2 was < 70%.<sup>7</sup>

In 1989, the Advisory Committee on Immunization Practices (ACIP) and the American Academy of Pediatrics (AAP) recommended a second dose of measles for all school aged children. The second dose recommendation was gradually accepted into school immunization requirements but, not before the measles epidemic of 1989-1991 where 55,685 confirmed cases and 123 deaths were reported.<sup>7</sup>

In 1996, the CDC made a renewed third call for elimination of measles, and by the year 2000, measles was eliminated from the U.S.<sup>7</sup> While mea-

les is still considered eliminated, defined by the CDC as the "absence of continuous disease transmission for 12 months or more in a specific geographic area" there remains risk that measles could become endemic again.

Measles comes from the paramyxovirus family. It is an acute viral respiratory infection that only affects humans and is spread through direct contact, airborne droplets, or contact with contaminated surfaces. Measles is highly contagious, infecting 9 out of 10 people who come into contact with the virus, likely from its ability to stay infectious in the air and on surfaces for up to 2 hours.<sup>16</sup> The first sign of infection, occurring 10-12 days after exposure, is a high fever, which lasts 4-7 days.<sup>16</sup> Other symptoms include the 3 C's: cough, conjunctivitis, and coryza (runny nose), as well as a maculopapular rash.<sup>17</sup> The rash starts on the face and upper neck, spreading to the rest of the body (image below), eventually reaching the hands and feet in about 3 days. The rash recedes and fades completely after about 6 days.<sup>16</sup> It is important to note that patients who are immunocompromised don't always present with a rash.<sup>8</sup>



Koplik spots, small bluish - white spots, can be found on the inside of patients' mouths during the initial stage of the disease (image below). Approximately 60-70% of patients infected with measles will develop koplik spots.<sup>18</sup> Complications can range from mild, severe, to life threatening and can include: diarrhea, dehydration, ear infections, blindness, pneumonia, encephalitis, and death. Severe cases can occur in children < 5 years of age, children who are malnourished (with insufficient vitamin A levels), pregnant women, and immunocompromised patients.<sup>16</sup>



According to the CDC, 3 out of 10 people infected with measles will experience mild complications ranging from ear infections to diarrhea. 1 in 20 patients infected will get pneumonia; 1 in 1,000 will experience encephalitis that can result in hearing loss and permanent intellectual disability; and 1-3 in 1,000 will die from measles related complications such as pneumonia, secondary bacterial pneumonia, or post viral encephalitis.<sup>19</sup> Additionally, 4-11 in 100,000 will develop subacute sclerosing panencephalitis (SSPE), a rare but fatal progressive neurological disorder that occurs 7-10 years after infection. There is no treatment for SSPE, and over the course of 1 - 3

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years after diagnosis, patients experience progressive cognitive deterioration which ultimately results in death.<sup>8,17</sup>

If measles infection is suspected, it should be reported to the CT DPH Epidemiology and Emerging Infections Program immediately by calling (860) 509-7994 or (860) 509-8000 (nights, weekends, and holidays). [A form](#) must also be submitted to the DPH within 12 hours. Diagnosis can be made by using a measles specific IgM antibody serum test or a measles RNA real time polymerase chain reaction (RT-PCR) test for respiratory specimens.<sup>8</sup> Patients who are infected with the measles virus should be isolated for 4 days after they develop a rash and airborne precautions should be followed.<sup>8</sup>

Supportive care is the only treatment for measles infection, however, the WHO recommends that all children diagnosed with measles receive two doses of vitamin A; the first dose administered upon diagnosis and the second dose given 24 hours later. Treatment restores low levels of vitamin A that can occur during measles infection. Vitamin A treatment helps to prevent eye damage and blindness and has also been shown to reduce the number of measles deaths.<sup>16</sup> The recommended dosing for Vitamin A is listed below.<sup>8</sup> Secondary bacterial infections can be a complication of measles that requires treatment with antibiotics.

- ◆ 50,000 IU for infants < 6 months
- ◆ 100,000 IU for infants 6 – 11 months
- ◆ 200,000 IU for children ≥ 12 months

The CDC recommends two doses of the measles vaccine to provide immunity against the virus. A single dose is included in both the MMR (measles, mumps, rubella) vaccine, as well as the MMRV (measles, mumps, rubella, and varicella) vaccine. It is recommended that all children receive one dose of MMR at 12-15 months of age, and the second dose at 4 -6 years of age. The

first dose of MMR is about 93% effective at preventing measles infection, and the second dose, used to prevent primary vaccine failure, is about 97% effective.<sup>8</sup> The MMRV vaccine can also be given to children who are between 12 months and 12 years of age, in place of a single MMR vaccine.<sup>20</sup> ACIP recommended that “all U.S. communities should maintain ≥95% levels of age-appropriate vaccination coverage with 2 doses of MMR vaccine to ensure herd immunity.”<sup>21</sup>

Common side effects from the MMR vaccine include; fever, rash, soreness at injection site, and pain or stiffness in the joints. There is no evidence that the MMR vaccine causes autism<sup>22</sup>, in fact, a study published in April of this year evaluated approximately 650,000 Danish children and found that MMR vaccination does not increase the risk for autism, does not trigger autism in susceptible groups of children, and is not associated with clusters of autism cases post vaccination.<sup>23</sup> The MMR vaccine is contraindicated in patients who are immunocompromised and patients who are pregnant.

Unvaccinated U.S. residents traveling internationally are at risk for measles infection, and cases in the U.S. are often linked to travelers who brought measles back from other countries.<sup>24</sup> Health care providers should vaccinate anyone planning to travel outside of the US who does not have evidence of immunity. Acceptable presumptive evidence of immunity includes:<sup>25,26</sup>

- ◆ Written (not self-reported) documentation of age-appropriate vaccination
- ◆ Laboratory evidence of immunity
- ◆ Laboratory confirmation of disease
- ◆ Birth before 1957

Any patient who does not have evidence of immunity needs two doses of the MMR vaccine, separated by at least 28 days.<sup>20</sup> Additionally, administering the MMR vaccine to unvaccinated patients who are exposed to measles within 72

hours can protect or lessen the clinical course of infection.<sup>21</sup> Immunoglobulin (IG) can also be administered within 6 days of exposure as post-exposure prophylaxis.<sup>8</sup>

Measles is a preventable public health problem that has recently seen a resurgence of cases in the U.S. Important steps to minimize outbreaks and maintain disease elimination can be taken by healthcare providers within Connecticut and the U.S. alike. Health care providers should ensure 2 doses of the MMR vaccine are given to all patients per the [CDC immunization schedule](#). Health care providers should advocate for vaccine coverage and communicate the benefits to populations at risk for not vaccinating. Actively listening to patient concerns regarding vaccine safety but continuing to provide strong recommendations about the importance of vaccinating is key. Additionally, if patients have continued concerns specifically about the MMR vaccine, the CDC has published documentation to help patients understand [MMR vaccine safety](#).

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