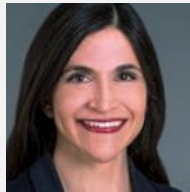




CDC/IDSA Clinician Call

April 17, 2024

Welcome & Introductions

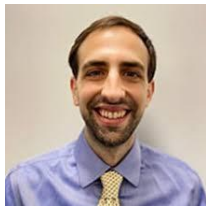


Dana Wollins, DrPH, MGC
Senior Vice President, Strategy
Infectious Diseases Society of America

- About the Clinician Call: Initiated in 2020 as a forum for information sharing among frontline clinicians caring for patients with COVID-19. Now expanded to address timely topics in infectious diseases—all from a clinical perspective.
- The views and opinions expressed here are those of the presenters and do not necessarily reflect the official policy or position of the CDC or IDSA. Involvement of CDC and IDSA should not be viewed as endorsement of any entity or individual involved.
- This webinar is being recorded and can be found online at www.idsociety.org/cliniciancalls.

CDC/IDSA Clinician Call: Focus on Measles

1. Epidemiology Update/Current State



Thomas (Dan) Filardo, MD

Medical Officer
Division of Viral Diseases
National Center for Immunization and Respiratory Diseases
U.S. Centers for Disease Control and Prevention

2. Clinical Presentation, Diagnosis and Management



Tina Q. Tan, MD, FAAP, FIDSA, FPIDS

Attending, Division of Infectious Diseases
Medical Director, International Patient and Destination Services Program
Vice-President, Lurie Medical/Dental Staff
Ann & Robert H. Lurie Children's Hospital of Chicago
Professor of Pediatrics, Northwestern University Feinberg School of Medicine

3. Infection Prevention & Control in Healthcare Settings



Christopher Prestel, MD, FAAP

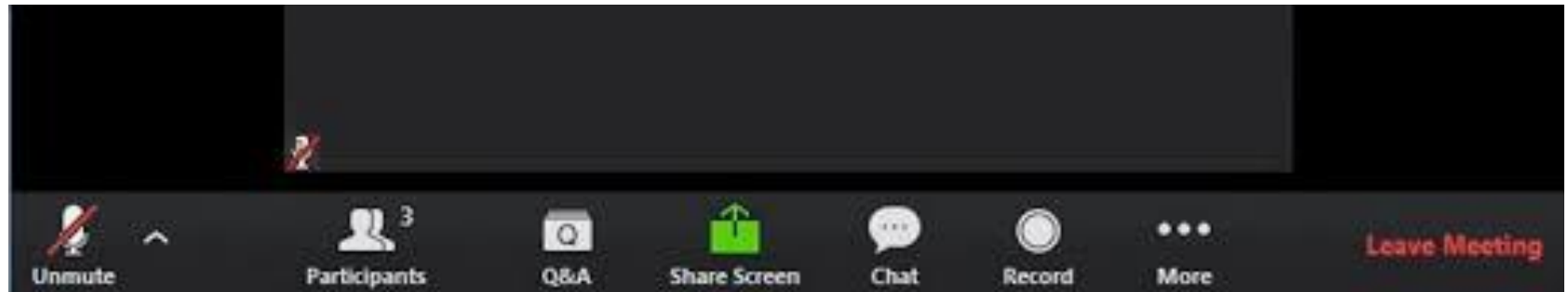
Medical Officer, Hospital Infection Prevention Team
Prevention and Response Branch
Division of Healthcare Quality Promotion
U.S. Centers for Disease Control and Prevention

4. Q&A/Discussion

Question?
Use the “Q&A” Button



Comment?
Use the “Chat” Button



Epidemiology Update/**Current State**

Thomas (Dan) Filardo, MD

Medical Officer

Division of Viral Diseases

National Center for Immunization and Respiratory Diseases

U.S. Centers for Disease Control and Prevention



Be on Alert for Travel- Related Measles



Dan Filardo, MD

Medical Officer

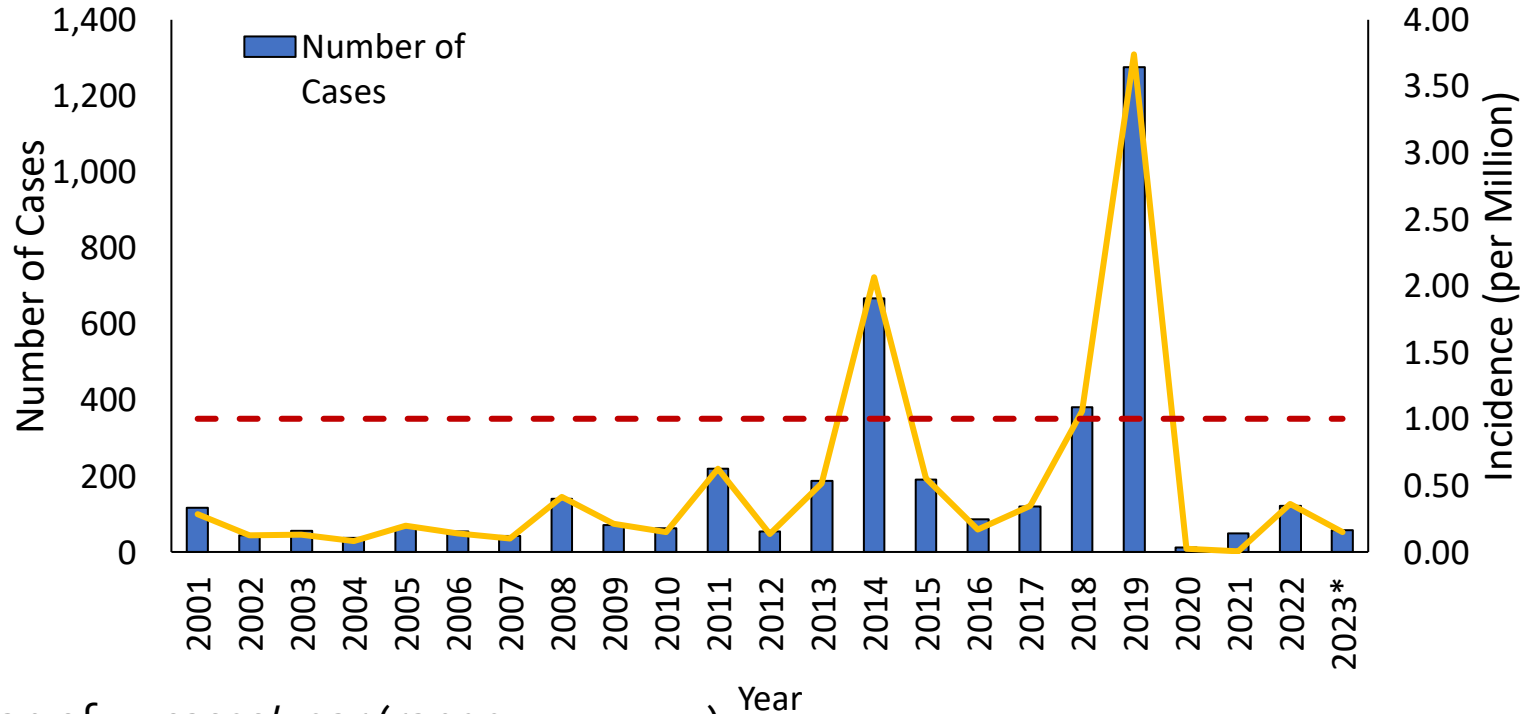
Division of Viral Diseases (DVD)

National Center for Immunization and Respiratory Diseases (NCIRD)



Reported Measles Cases, United States, 2001-2023

(N=4,114)



Median of 72 cases/year (range: 13– 1,274)

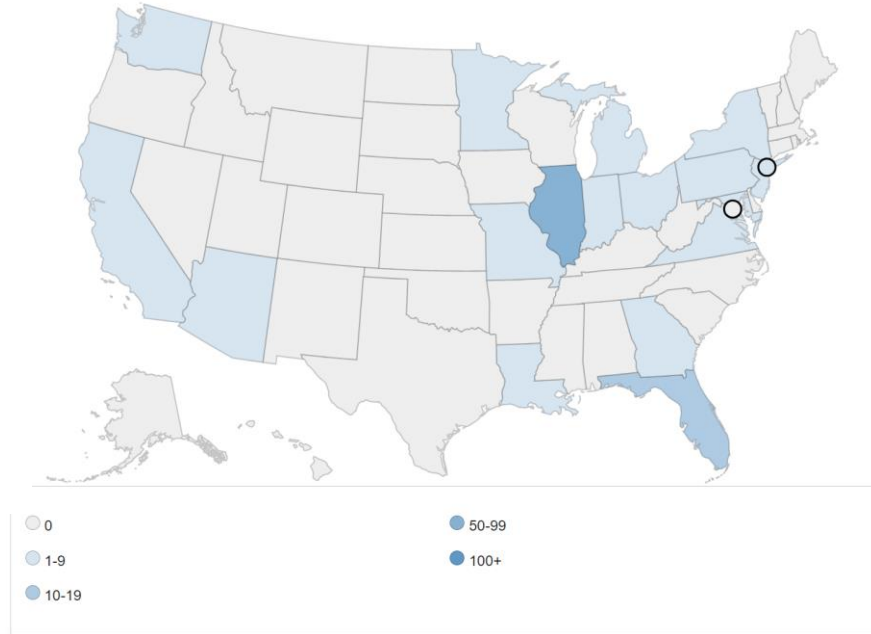
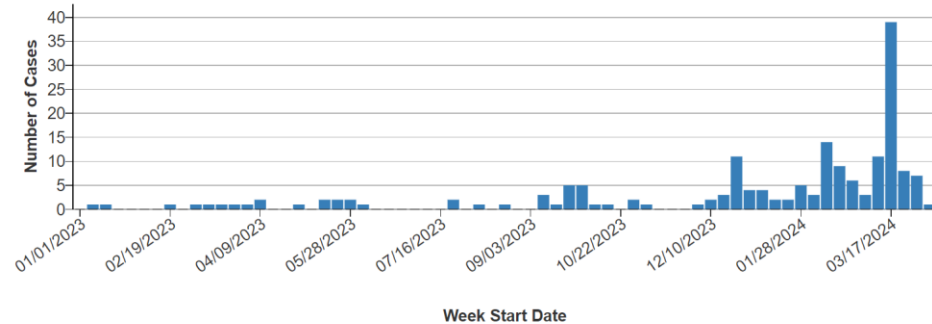
*2023 data are preliminary.

U.S. Measles Cases, Jan 1, 2023– Apr 11, 2024

As of April 11, 2024

Number of measles cases reported by week

2023-2024* (as of April 11, 2024)



Measles, Mumps, Rubella (MMR) Vaccine

Routine vaccination schedule

- Dose 1: age 12–15 months
- Dose 2: age 4–6 years

International travelers aged ≥ 6 months

- Age 6–11 months: 1 documented dose prior to departure
- Age ≥ 12 months: 2 documented doses prior to departure, separated by at least 28 days

Measles, Mumps, Rubella (MMR) Vaccine

For adults, presumptive evidence of immunity includes at least one of the following:

- Written documentation of 1 dose of MMR (except for adults in settings at high risk for measles transmission, see below)
 - Birth before 1957
 - Laboratory evidence of immunity (positive IgG)
 - Prior laboratory confirmed measles diagnosis
- Adults without evidence of immunity should get at least one dose of MMR
 - Two doses are recommended for adults in settings that pose a high risk for measles transmission:
 - Healthcare personnel
 - International travelers
 - Postsecondary school students

MMR Coverage among U.S. Kindergartners

	2019-20	2020-21	2021-22	2022-23
MMR (2 doses)	95.2	93.9	93.0	93.1

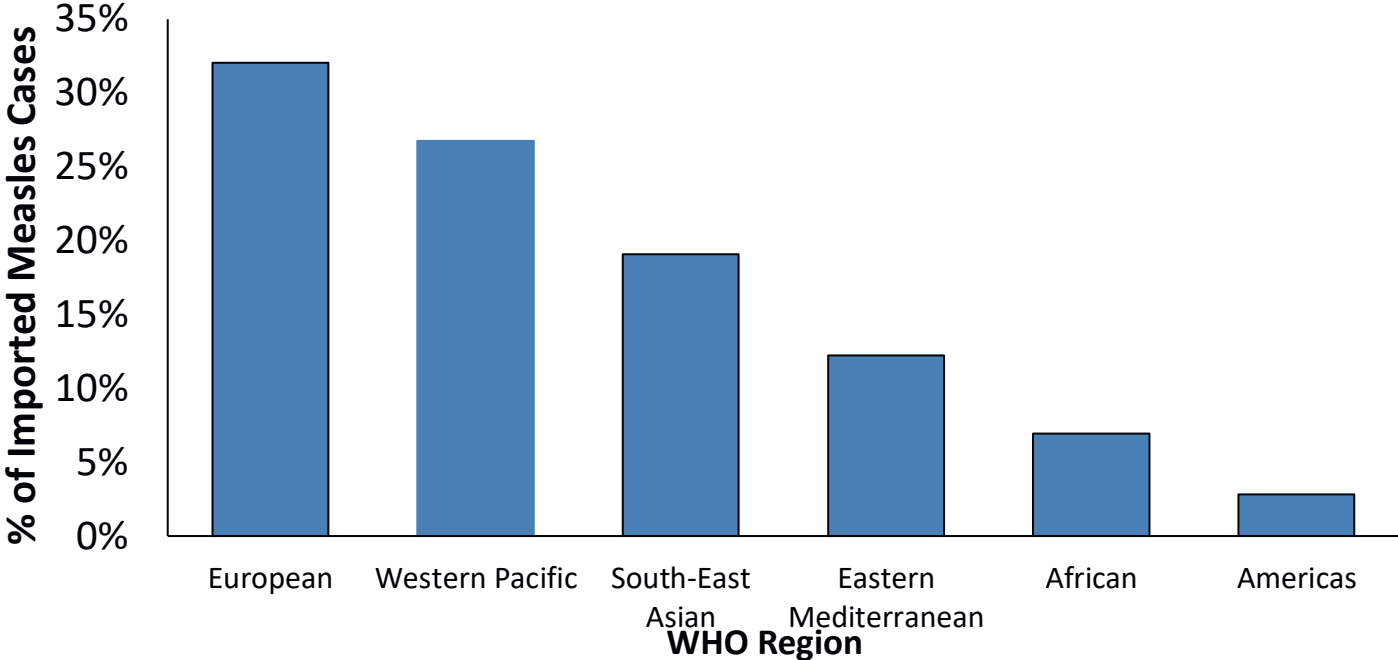
National MMR coverage of 93.1% translates to **250,000** kindergartners at risk of measles infection each year



International Travel Risk

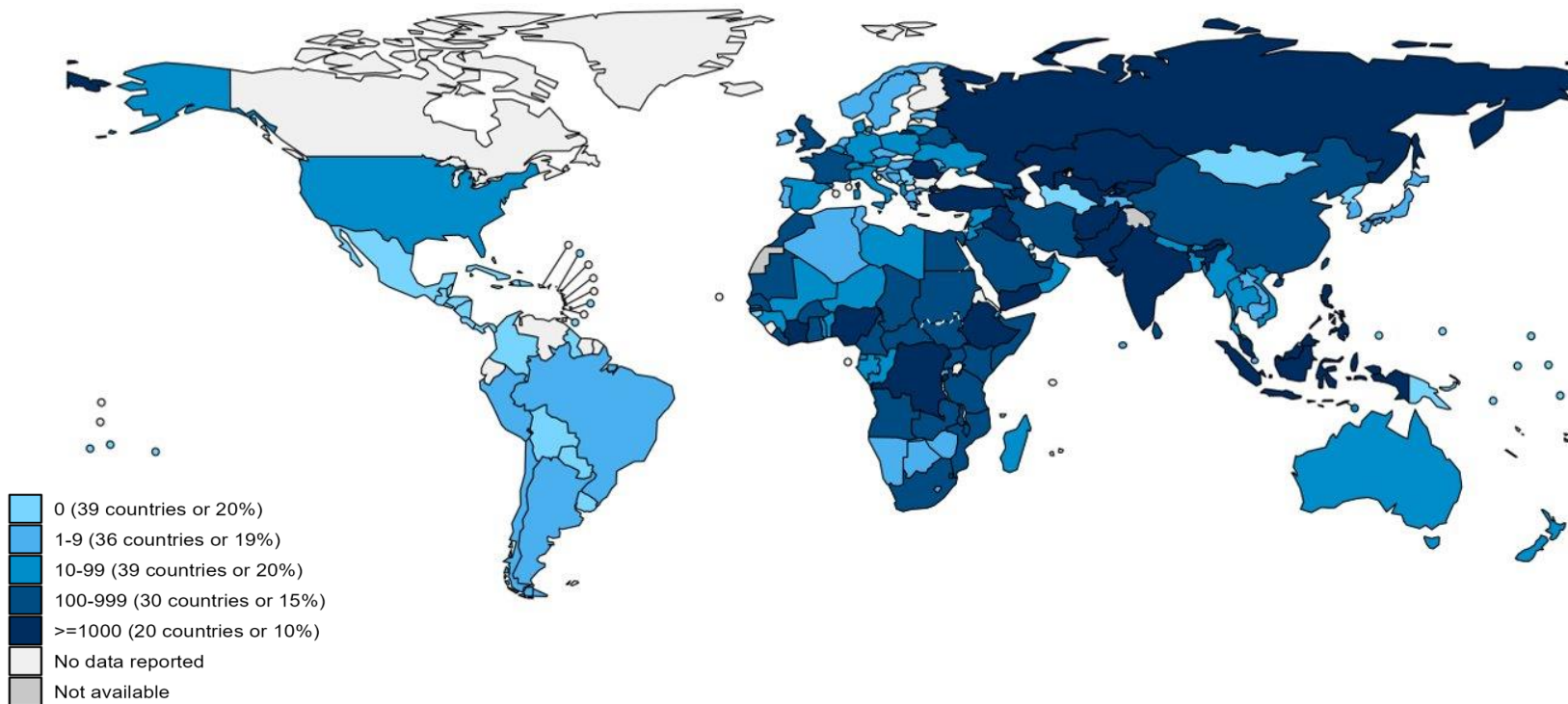
Imported Measles Cases in the U.S., 2001–2023

- 63% of importations occurred among US residents
- 59% of importations were related to travel to countries in the European or Western Pacific Regions



Number of Reported Measles Cases (last 6 months)

Data as of March 2024 (WHO)

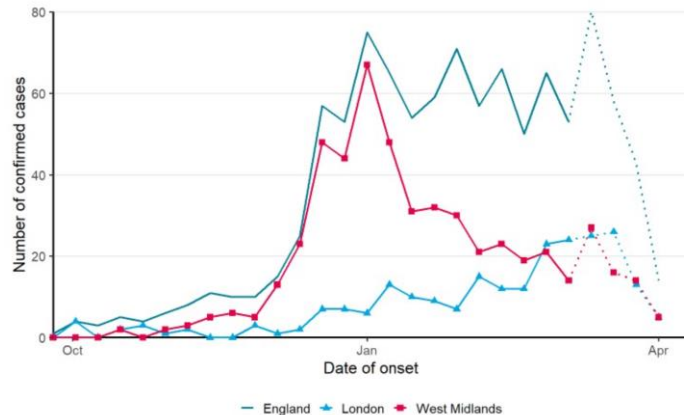


England and Western Europe Reporting Measles Outbreaks

Press release

London at risk of measles outbreaks with modelling estimating tens of thousands of cases

UKHSA modelling suggests that, unless MMR vaccination rates improve, London could see a measles outbreak with tens of thousands of cases.



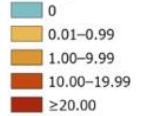
Notification rate of measles (per million), February 2023 - January 2024

Map
27 Feb 2024

Translate this page



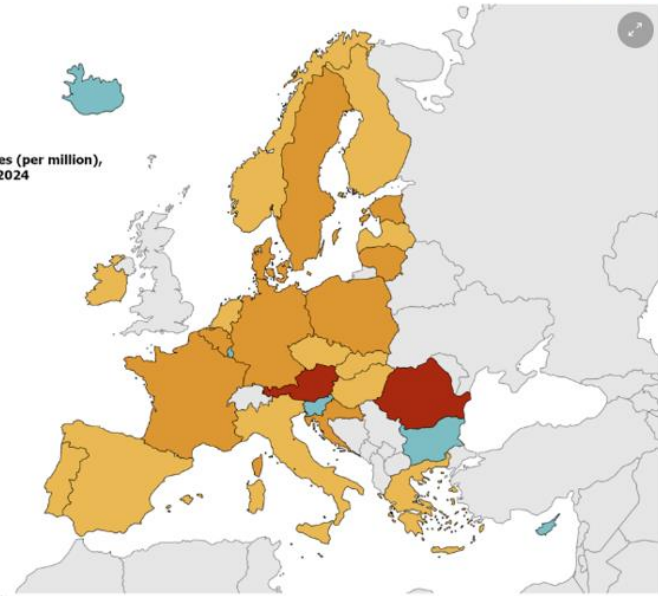
Notification rate of measles (per million), February 2023 - January 2024



▨ No data reported
▨ Not included

Countries not visible in the main map extent

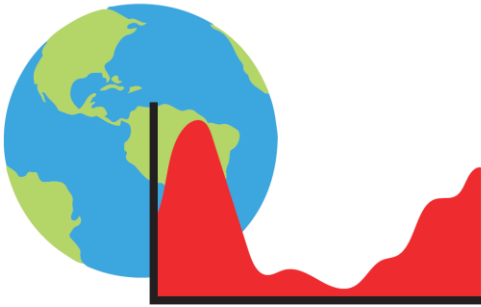
▨ Liechtenstein
▨ Malta



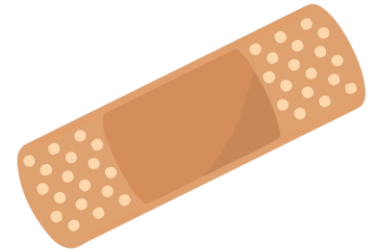
ECDC. Administrative boundaries: © EuroGeographics. The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the European Union.

ECDC. Map produced 26 Feb 2024

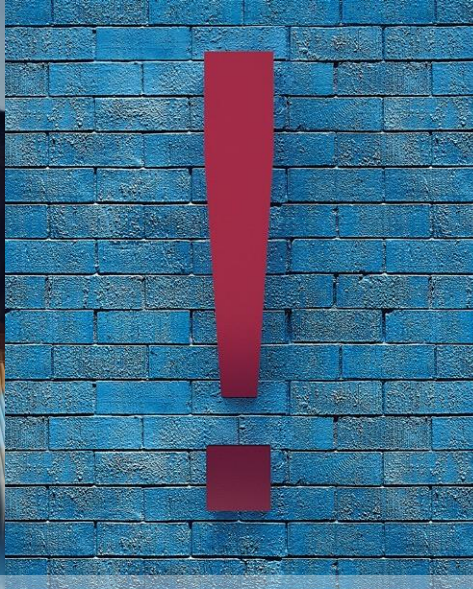
Measles outbreak risk in the U.S. depends on two main factors:



Global measles activity



MMR vaccination
coverage in the U.S.



THANK YOU

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention



For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

Measles: Clinical Presentation, Diagnosis and Management

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Measles: Clinical Presentation, Diagnosis and Management

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Conflict of Interest Disclosures

- **Advisor/Consultant:**
 - **Merck, Sanofi Pasteur, GSK, Pfizer, IliAD, Moderna, Novavax**
- **Research Funding:**
 - **GSK, AstraZeneca**



Measles Background

- Measles is an acute viral respiratory illness caused by an enveloped RNA virus that is member of the genus *Morbillivirus* in the *Paramyxoviridae* family.
- Humans are the only natural host for the measles virus.
- Measles virus is transmitted by direct contact with infectious droplets from coughing, sneezing, or breathing, or less commonly by airborne spread.
- It is one of the most highly communicable of all infectious diseases with an attack rate in an exposed susceptible individual of 90% in close-contact settings. Population immunity of $\geq 95\%$ is needed to stop ongoing transmission.

Measles Presentation

- Incubation period is generally 8 to 12 days from exposure to the onset of the prodromal symptoms.
- The prodromal symptoms are characterized by:
 - Fever (as high as 105° F) and malaise
 - Cough, coryza, and conjunctivitis - the three “C”s
 - A pathognomonic enanthema (Koplik spots – present on the buccal mucosa) and,
 - A maculopapular rash. The rash usually appears about 14 days after a person is exposed. The rash spreads from the head (starting around the hairline/face) to the trunk to the lower extremities.
- Patients are considered to be contagious from 4 days before to 4 days after the rash appears. Therefore, they should be isolated from others for 4 days after developing the rash.

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Measles Presentation - Immunocompromised

- In the immunocompromised population, MMR vaccine for the most part is contraindicated.
- With increasing levels of immunosuppression, persons exposed to measles may present with more atypical signs and symptoms and are at high risk for complications.
 - Over 50% of persons may present with an atypical rash (maculopapular, transient, or severe and desquamating) and 20% may present without rash and are diagnosed only after developing severe complications (such as pneumonia, liver failure, encephalitis) or at autopsy.
 - Persons may also not have fever and/or upper respiratory symptoms
- Key to diagnosis in this population is an awareness of community and epidemiologic risk.
- Persons with concerning symptoms and exposure to a known measles case without evidence of immunity should be immediately isolated and tested for measles. Those with documented exposures should be excluded from public locations and from contact with others persons susceptible to measles for a minimum of 21 days.

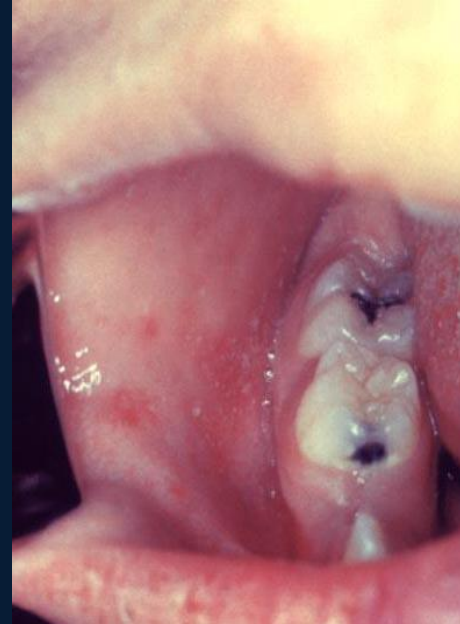
Clinical Findings - Measles



Red, blotchy confluent rash



Conjunctivitis and facial rash



Koplik spots

Groups at High Risk for Complications from Measles

- **Children under 5 years of age**
- **Adults \geq 20 years of age**
- **Pregnant Women**
- **Persons of any age with compromised immune systems from any cause**

Complications of Measles

Common complications

- Otitis media – occurs in 1 in 10 infants and children with measles
- Diarrhea – occurs in less than 1 in 10 persons with measles

Severe complications



Hospitalization. About 1 in 5 unvaccinated people in the U.S. who get measles is **hospitalized**.



Pneumonia. As many as 1 out of every 20 children with measles gets pneumonia, the most common cause of **death from measles in young children**.



Encephalitis. About 1 child out of every 1,000 who get measles will develop encephalitis (swelling of the brain) that can lead to convulsions and can **leave the child deaf or with intellectual disability**.



Death. Nearly 1 to 3 of every 1,000 children who become infected with measles will **die from respiratory and neurologic complications**.



Complications during pregnancy. Measles may cause [pregnant women who have not had the MMR vaccine](#) to **give birth prematurely, or have a low-birth-weight baby**.

Serious CNS Measles Complications

There are three rare but serious complications of measles that can involve the central nervous system (CNS).

- Acute disseminated encephalomyelitis (ADEM) - is a demyelinating autoimmune disease often triggered by viral infections and occurring within days to weeks in approximately 1 in 1000 measles cases.
- Measles inclusion body encephalitis (MIBE) – also known as subacute measles encephalitis occurs more commonly in hosts with immune system disorders and develops within months of a measles infection.
- Subacute sclerosing panencephalitis (SSPE) - is a chronic, degenerative, fatal neurologic disease that occurs on average 7 years after measles, particularly in children infected before 2 years of age, and it is almost invariably caused by wildtype virus. It is estimated that the risk of SSPE after measles is 1 per 11,000 cases.

Measles Diagnosis

Diagnosis:

- Usually made clinically based on the symptoms the patient has and community and epidemiologic exposure risk
- Infection can be confirmed by:
 - 1) Detection of measles viral RNA by reverse transcriptase polymerase chain reaction (RT-PCR) in blood; throat, nasal, and posterior nasopharyngeal swab specimens; bronchial lavage samples; or urine with respiratory samples being the preferred specimen
 - 2) Detection of measles virus specific immunoglobulin M (IgM) in serum – preferred method for case confirmation
 - 3) A fourfold increase in measles IgG antibody concentration in paired acute and convalescent serum specimens collected at least 10 days apart
 - 4) Isolation of measles virus in cell culture
- Sampling more than one site may increase sensitivity so a serum sample and throat swab sample should be obtained from any patient in whom measles is suspected.

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Measles Treatment

- There is no specific antiviral therapy for measles that is available.
- The WHO recommends Vitamin A for all children with measles regardless of their country of residence and most US experts agree with this recommendations for all children regardless if patient is hospitalized. In resource limited countries, Vitamin A treatment of children with measles is associated with decreased morbidity and mortality rates. Vitamin A helps to prevent eye damage and blindness.
- Vitamin A treatment of measles is administered once daily for 2 days starting immediately upon diagnosis and repeated the following day.
Dosing is:
 - 200,000 IU (60,000 ug retinol equivalent (RAE) for children 12 months or older
 - 100,000 IU (30,000 ug RAE) for infants 6 through 11 months of age²⁸
 - 50,000 IU (15,000 ug RAE) for infants younger than 6 months
- An additional age-specific dose of Vitamin A should be given 2 through 6 weeks later to children with clinical signs and symptoms of Vitamin A deficiency

Measles Treatment

- **Intravenously immune globulin (IVIG) at 400 mg/kg can be administered within 6 days of measles exposure to prevent or modify the course of measles in people who do not have evidence of measles immunity and are at high risk for complications from disease. This includes:**
 - **pregnant women**
 - **severely immunocompromised hosts including patients with severe primary immunodeficiency**
 - **patients who have received a hematopoietic stem cell transplant**
 - **patients undergoing treatment for acute lymphoblastic leukemia within at least 6 months after completion of chemotherapy**
 - **solid organ transplant recipients**
 - **people with HIV who have severe immunosuppression and**
 - **patients younger than 12 months of age whose mothers received biologic response modifiers during pregnancy**

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Measles Management

- Caregiving is supportive and should focus on easing and relieving symptoms, making the person comfortable, and preventing complications.
- Staying well hydrated by drinking enough water and treatments for dehydration can replace fluids lost due to diarrhea or vomiting. Eating a healthy diet is also important.
- Antibiotics may be used to treat pneumonia and ear and eye infections that may occur. The most common bacterial organisms causing pneumonia with measles are: *Streptococcus pneumoniae*, *Staphylococcus aureus*, and *Haemophilus influenzae* type b.
- Rash from measles usually last for 5 to 6 days before fading with duration of uncomplicated illness usually being 7 to 10 days

MMR Vaccine

- **Protects against measles, mumps and rubella and is the best method of protection against these diseases**
- **Part of routinely recommended US childhood immunization schedule – 1st dose given at 12 months of age and 2nd dose given at 4-6 years of age**
- **One dose has a 93% efficacy against measles**
- **Two doses have a 97% efficacy against measles**

Speaking to Parents about Importance of Vaccination

- **Parents consider their child's health care provider to be their most trusted source of information on vaccines. Most parents want to do what is best for their child.**
- **During a vaccine visit, state which vaccines the infant/child will need and assume that the parents will accept vaccine recommendations.**
- **If parents have questions and concerns about vaccines, provide reassurance by listening to parents' concerns and acknowledge them in a non-confrontational way.**
- **Address the parents' questions and concerns by providing trusted information (Vaccine Information Statements, reliable websites, educational resources) on the significant impact that vaccines have had in controlling vaccine preventable diseases and clarify misconceptions and misinformation. Have an open dialogue.**

Speaking to Parents about Importance of Vaccination

- **Personalize the information provided to parents based on cultural beliefs, vaccine concerns, and health literacy level.**
- **Provide strong recommendations on the importance and benefits of vaccines for the infant/child. Stress that vaccination is the most effective way to build a child's immune system so that they can stay healthy and are protected against potentially serious life- threatening diseases.**

Measles Control Requires Close Collaboration Between Clinicians and Public Health



- Early notification of suspect and confirmed cases to public health can assist clinicians and help prevent outbreaks
 - Rapid contact investigation
 - Early identification of contacts at high risk of severe measles and possible settings for transmission
 - Post-exposure guidance for susceptible contacts
 - Coordination of laboratory testing
 - Interpretation of lab testing and coordination of advanced testing, if necessary



Health System Preparedness Includes Public Health Partners

- Health systems can collaborate with public health departments to be prepared for measles
 - Building measles testing into EMRs through standardized order sets
 - Includes potentially routing to public health laboratories
 - Establishing protocols for notification and management of contacts, including post-exposure prophylaxis
 - Ensuring access to MMR vaccine if needed for outbreak control
 - Provider training on recognition and management of measles cases





INFECTION PREVENTION AND CONTROL IN HEALTHCARE SETTINGS

Christopher Prestel, MD, FAAP

Medical Officer, Hospital Infection Prevention

Team

Prevention and Response Branch

Division of Healthcare Quality Promotion

U.S. Centers for Disease Control and Prevention



Measles Infection Prevention and Control Overview

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Medical Officer, Hospital Infection Prevention Team

Prevention and Response Branch (PRB)

Division of Healthcare Quality Promotion (DHQP)

April 17th, 2024

The findings and conclusions in this presentation are those of the author(s) and do not necessarily represent the views of the Centers for Disease Control and Prevention/the Agency for Toxic Substances and Disease Registry.

Measles and Healthcare Settings

- **During 2001-2014, 6% (78/1,318) of non-imported U.S. measles cases were transmitted in healthcare settings**
- **Most transmission events happen before recognition or suspicion**
 - Important to avoid delayed recognition and implementation of appropriate precautions for measles

Preventing Measles Transmission in Healthcare Settings

- **Vaccination is the primary prevention strategy**
 - Presumptive evidence of measles immunity is recommended for all healthcare providers
 - Provide immunizations to non-immune staff
- **Presumptive evidence of measles immunity for healthcare workers includes:**
 - Documentation of vaccination with 2 doses of live measles virus-containing vaccine
 - Laboratory evidence of immunity
 - Laboratory confirmation of disease
 - Birth before 1957

Preventing Measles Transmission in Healthcare Settings

- **Rapidly identify and isolate measles patients (known or suspected)**
- **Adhere to Standard and Airborne Precautions**
- **Management of exposed and ill healthcare personnel**

Identify and Triage Patients with Suspected Measles to Minimize the Potential for Exposure

- **Post visual alerts and instructions on prevention efforts for patients with potentially infectious syndromes (wearing a facemask, notifying staff) at entry points**
- **At triage stations ask about symptoms of infection**
 - Ask about fever, rash, respiratory symptoms, recent international travel, exposure to individuals with confirmed measles
- **Provide patients with suspected measles (or infectious syndromes) with a mask and isolate from other patients**
 - If measles is suspected isolate patients using Airborne Precautions

Identify and Triage Patients with Suspected Measles to Minimize the Potential for Exposure

- **By phone:**

- Ask about symptoms of infection and provide patient instructions for arrival
 - Which entrance to use (low-traffic or protected entrance)
 - What to do on arrival (notify staff, wear a facemask, follow triage procedures)
- If measles is suspected, prepare area for isolation (airborne infection isolation room)

- **By medical transport:**

- Instruct Emergency Medical Services staff to notify receiving facilities in advance when transporting a patient with known or suspected measles

Limit patient transportation within the facility

- **Limit transportation of patients with known or suspected measles for essential purposes only (needs that cannot be provided in a patients' room or the facility)**
- **Patient should wear a facemask**
- **Notify healthcare providers in advance**
 - Receiving area within the facility
 - Transportation vehicle personnel
 - Receiving facility

Airborne Precautions Limits the Transmission of Measles

- **Healthcare providers (regardless of immunity) should use respiratory protection that is at least as protective as a fit-tested, NIOSH-certified, disposable N95 filtering facepiece or respirator**
 - Continue AIIR and respiratory protection for patients until 4 days after rash onset; or duration of illness for immunocompromised patients
- **Limit visitors to those necessary for well-being and care of the patient**
 - Visitors without evidence of immunity should not enter the room
- **Immediately place masked patients in an airborne infection isolation room (AIIR)***

*<https://www.cdc.gov/infectioncontrol/pdf/guidelines/isolation-guidelines-h.pdf>

Arrange for Patient Placement and Possible Alternatives

- **AllIR should meet current standards with daily monitoring of pressure***
- **If AllIR is not available**
 - Place the masked patient in a private room with the door closed
 - Transfer the patient as soon as possible to a facility with AllIR capability
 - Preferably, avoid placement where room exhaust is recirculated without high-efficiency particulate air (HEPA) filtration

*<https://www.cdc.gov/infectioncontrol/pdf/guidelines/isolation-guidelines-h.pdf>

Considerations on Cleaning, Disinfection, and Regulated Medical Waste

- **Standard cleaning and disinfection procedures are appropriate for measles**
- **EPA-registered disinfectants should be used per the manufacturer's instructions for use**
- **No special management of measles waste is required**
 - Follow federal and local regulations for management of regulated medical waste

Notify Appropriate Facility Personnel and Public Health Authorities for Suspected or Confirmed Cases

- **Communicate with key facility staff, including leadership, infection control, hospital epidemiology, and occupational health**
- **Immediately notify public health authorities about suspected or confirmed measles cases, including suspected healthcare-associated transmission**

Resources: Interim Recommendations

- Provides fundamental elements to prevent measles transmission in healthcare settings
- Repository of all measles-related infection prevention and control recommendations including what was covered on this presentation



Interim Infection Prevention and Control Recommendations for Measles in Healthcare Settings

Updated July 2019


<https://www.cdc.gov/infectioncontrol/pdf/guidelines/Measles-Interim-IC-Recs-H.pdf>


Resources: Think Measles

- **Project Firstline and American Academy of Pediatrics one-pager**

- Quick information on:

- Symptoms
- Triage
- IPC precautions
- Public health notification
- Clinical care
- Photos for recognition

 **PROJECT FIRSTLINE**
CDC National Training Laboratory
for Healthcare Infection Prevention & Control

 American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN[®]


Think Measles


Consider measles in any patient presenting with a febrile rash illness, especially if unvaccinated for measles or traveled internationally in the last 21 days.

- 1 Measles Symptoms**
 - High Fever
 - Cough
 - Coryza (runny nose)
 - Conjunctivitis (red, watery eyes)
 - Maculopapular Rash
 - Typically appears 2-4 days after symptoms begin.
 - Begins at hairline, spreads downward, to face, neck, and trunk.
 - Rash appears red on light complexions, but may be harder to see or appear as purple or darker than surrounding skin on dark complexions.
- 2 Pre-Visit Telephone Triage**
 - For those reporting measles symptoms, assess the risk of exposure:
 - Are measles cases present in your community?
 - Did the patient spend time out of the country in the 21 days before symptom onset?
 - Has the patient ever received the MMR vaccine?
 - Triage should only be completed by a clinically trained person.
 - If patient will be seen in the office, provide instructions on face masks for patient (2 years of age and older) and family.
 - Instruct to arrive to a side or back entrance instead of the main entrance.
- 3 Patients Presenting with Suspected Measles**
 - Provide face masks to patients (2 years of age and older) and family before they enter the facility. Patients unable to wear a mask should be "tentted" with a blanket or towel when entering the facility.
 - Immediately move patient and family to an isolated location, ideally an airborne infection isolation room (AIIR) if available. If unavailable, use a private room with the door closed.
 - No other children should accompany a child with suspected measles.
 - Patients (2 years of age and older) and family should leave face masks on if feasible.
- 4 Infection Prevention Precautions**

Only health care providers with immunity to measles should provide care to the patient and family. Standard and airborne precautions should be followed, including:

 - Use of a fit tested NIOSH-approved N95 or higher-level respirator.
 - Use of additional PPE if needed for task (e.g., gloves for blood draws).
 - Cleaning hands before and after seeing the patient.
 - Limiting transport or movement of patients outside of room unless medically necessary.
- 5 Public Health Notification**
 - To ensure rapid investigation and testing with contact tracing, notification should occur immediately upon suspicion of measles. Public health departments will be able to help confirm vaccination history for U.S. residents, provide guidance on specimen collection and submission, and manage contacts of confirmed cases.
 - Acute care facilities should immediately notify the hospital epidemiologist or infection prevention department.
 - Outpatient settings should immediately notify local or state health departments.
- 6 Clinical Care**
 - People with confirmed measles should isolate for four days after they develop a rash.
 - If an AIIR was not used, the room should remain vacant for the appropriate time (up to 2 hours) after the patient leaves the room.
 - Standard cleaning and disinfection procedures are adequate for measles virus environmental control.

 **Maculopapular Rash**
Source: CDC-PHIL



Project Firstline is a national collaborative led by the U.S. Centers for Disease Control and Prevention (CDC) to provide infection control training and education to frontline healthcare workers and public health personnel. American Academy of Pediatrics is proud to partner with Project Firstline, as required through Cooperative Agreement CDC-904-071819-0001, an agency within the Department of Health and Human Services (HHS). The contents of this flyer do not necessarily represent the policies of CDC or HHS and should not be considered an endorsement by the Federal Government.

Resources:
Measles Red Book Online Outbreaks Page
CDC Interim Infection Prevention and Control Recommendations for Measles in Healthcare Settings

Q&A/ Discussion

Selected Resources

Program Links:

- This webinar is being recorded and can be found with the slides online at <https://www.idsociety.org/cliniciancalls>
- COVID-19 Real-Time Learning Network: <https://www.idsociety.org/covid-19-real-time-learning-network/>
- Vaccine FAQ: <https://www.idsociety.org/covid-19-real-time-learning-network/vaccines/vaccines-information--faq/>

Dr. Filardo

- www.cdc.gov/measles/cases-outbreaks.html
- https://www.cdc.gov/mmwr/volumes/72/wr/mm7245a2.htm?s_cid=mm7245a2_w
- <https://www.cdc.gov/ncird/whats-new/measles-outbreak-risk-in-us.html#>

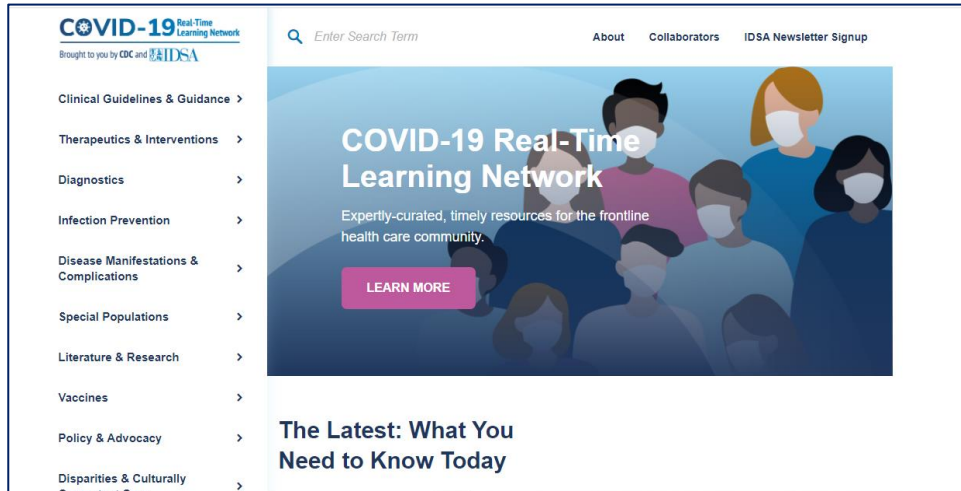
Dr. Prestel

- <https://www.cdc.gov/infectioncontrol/pdf/guidelines/isolation-guidelines-h.pdf>
- <https://www.cdc.gov/infectioncontrol/pdf/guidelines/Measles-Interim-IC-Recs-H.pdf>
- <https://downloads.aap.org/AAP/PDF/ThinkMeasles-final.pdf>

COVID-19 Real-Time Learning Network

Brought to you by CDC and IDSA

An online community bringing together information and opportunities for discussion on latest research, guidelines, tools and resources from a variety of medical subspecialties around the world.



Specialty Society Collaborators

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American College of Emergency Physicians
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American College of Physicians
American Geriatrics Society
American Thoracic Society
Pediatric Infectious Diseases Society
Society for Critical Care Medicine
Society for Healthcare Epidemiology of America
Society of Hospital Medicine
Society of Infectious Diseases Pharmacists

www.COVID19LearningNetwork.org

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THANK YOU

We want to hear from you!

Please complete the post-call survey.

A recording of this call, slides and the answered Q&A will be posted at

www.idsociety.org/cliniciancalls

-- library of all past calls available --

Contact Us:

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