Reading and Resources

Textbook: *Principles of Public Health Microbiology*, The Scope of Public Health Microbiology, pages 1–7

This reading will introduce you to public health microbiology and the ways a person may encounter an infectious disease.

Waterborne Diseases, pages 75–78

This reading will introduce you to the concept of the case-control study and how it is used in public health.

Article: Types of Microbes (attached file)
This reading will introduce you to the five types of microbes. Attached File

Review all three of the following case studies, as you will be choosing one of them to be used throughout the course for your final project.
Case Studies: *Principles of Public Health Microbiology*
Case Studies on Water and Wastewater

"Cryptosporidium Outbreak in Milwaukee," pages 157–164 Food, "Viruses in imported clams and Waterborne case study," page 185

Article: Measles Outbreak (Attached File)
You will need to read this case study to complete Milestone Two

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People.™
Morbidity and Mortality Weekly Report (*MMWR*)

Measles Outbreak — California, December 2014–February 2015

Please note: *An erratum has been published for this article. To view the erratum, please click here.*

Weekly

February 20, 2015 / 64(06);153-154

On February 13, 2015, this report was posted as an MMWR *Early Release on the* MMWR *website (http://www.cdc.gov/mmwr).*

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On January 5, 2015, the California Department of Public Health (CDPH) was notified about a suspected measles case. The patient was a hospitalized, unvaccinated child, aged 11 years with rash onset on December 28. The only notable travel history during the exposure period was a visit to one of two adjacent Disney theme parks located in Orange County, California. On the same day, CDPH received reports of four additional suspected measles cases in California residents and two in Utah residents, all of whom reported visiting one or both Disney theme parks during December 17–20. By January 7, seven California measles cases had been confirmed, and CDPH issued a press release and an Epidemic Information Exchange (Epi-X) notification to other states regarding this outbreak. Measles transmission is ongoing (Figure).

As of February 11, a total of 125 measles cases with rash occurring during December 28, 2014–February 8, 2015, had been confirmed in U.S. residents connected with this outbreak. Of these, 110 patients were California residents. Thirty-nine (35%) of the California patients visited one or both of the two Disney theme parks during December 17–20, where they are thought to have been exposed to measles, 37 have an unknown exposure source (34%), and 34 (31%) are secondary cases. Among the 34 secondary cases, 26 were household or close contacts, and eight were exposed in a community setting. Five (5%) of the California patients reported being in one or both of the two Disney theme parks during their exposure period outside of December 17–20, but their source of infection is unknown. In addition, 15 cases linked to the two Disney theme parks have been reported in seven other states: Arizona (seven), Colorado (one), Nebraska (one), Oregon (one), Utah (three), and Washington (two), as well as linked cases reported in two neighboring countries, Mexico (one) and Canada (10).

Among the 110 California patients, 49 (45%) were unvaccinated; five (5%) had 1 dose of measles-containing vaccine, seven (6%) had 2 doses, one (1%) had 3 doses, 47 (43%) had unknown or undocumented vaccination status, and one (1%) had immunoglobulin G seropositivity documented, which indicates prior vaccination or measles infection at an undetermined time. Twelve of the unvaccinated patients were infants too young to be vaccinated. Among the 37 remaining vaccine-eligible patients, 28 (67%) were intentionally unvaccinated because of personal beliefs, and one was on an alternative plan for vaccination. Among the 28 intentionally unvaccinated patients, 18 were children (aged <18 years), and 10 were adults. Patients range in age from 6 weeks to 70 years; the median age is 22 years. Among the 84 patients with known hospitalization status, 17 (20%) were hospitalized.

The source of the initial Disney theme park exposure has not been identified. Specimens from 30 California patients were genotyped; all were measles genotype B3, which has caused a large outbreak recently in the Philippines, but has also been detected in at least 14 countries and at least six U.S. states in the last 6 months (*1*).

Annual attendance at Disney theme parks in California is estimated at 24 million (*2*), including many international visitors from countries where measles is endemic. The December holiday season coincides with the exposure period of interest. Since 2011, six confirmed measles cases have been reported to CDPH in persons whose notable exposure was to large theme parks that attract international tourists. International travel to countries where measles is endemic is a well-known risk factor for measles, and measles importations continue to occur in the United States; the number of measles cases reported to CDC is updated weekly at http://www.cdc.gov/measles/cases-outbreaks.html. However, U.S. residents also can be exposed to measles in the United States at venues with large numbers of international visitors, such as other tourist attractions and airports. This outbreak illustrates the continued importance of ensuring high measles vaccination coverage in the United States.

Acknowledgments

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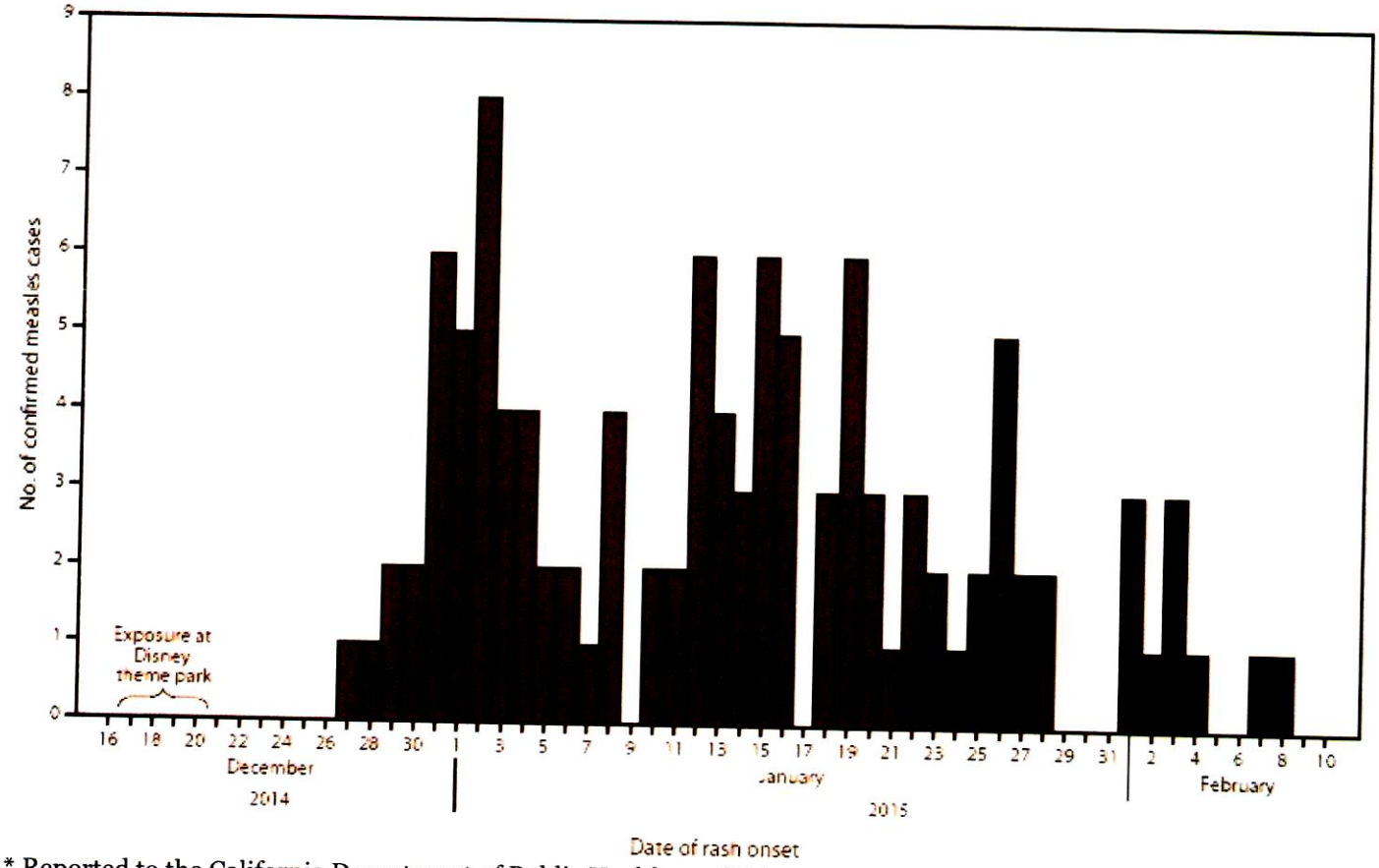
References

1. CDC. U.S. multi-state measles outbreak, December 2014–January 2015. Atlanta, GA: US Department of Health and Human Services, CDC; 2015. Available at http://emergency.cdc.gov/han/han00376.asp.
2. Themed Entertainment Association, AECOM. Global attractions attendance report. Burbank, CA: Themed Entertainment Association, AECOM; 2014. Available at http://www.aecom.com/deployedfiles/Internet/Capabilities/Economics/_documents/ThemeMuseumIndex_2013.pdf.

FIGURE. Number of confirmed measles cases (N = 110),* by date of rash onset — California, December 2014–February 2015



* Reported to the California Department of Public Health as of February 11, 2015.

Alternate Text: The figure above is a histogram showing the number of confirmed measles cases (N = 110), by date of rash onset in California during December 2014-February 2015.

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→

ABOUT MICROBIOLOGY

- What is a Microbe?
- Types of Microbes
  - Archaea
  - Viruses
  - Bacteria
  - Fungi
  - Protista
  - Microbial Mergers
- Interesting Facts
- Careers in Microbiology
- History of Microbiology
- Classroom Experiments
- Washup.org
- Podcasts & Videos

Types of Microbes

Tags:

Microbes can be divided into six main types: Archaea, Bacteria, Fungi, Protista, Viruses, and Microbial Mergers.

Archaea

These bacteria look-alikes are living fossils that are providing clues to the earliest forms of life on Earth.
:::more:::

Bacteria

Often dismissed as "germs" that cause illness, bacteria help us do an amazing array of useful things, like make vitamins, break down some types of garbage, and maintain our atmosphere.
:::more:::

Fungi

From a single-celled yeast to a 3.5-mile-wide mushroom, fungi do everything from helping to bake bread to recycling to decomposing waste.
:::more:::

Protista

Plant-like algae produce much of the oxygen we breathe; animal-like protozoa (including the famous amoeba) help maintain the balance of microbial life.
:::more:::

Viruses

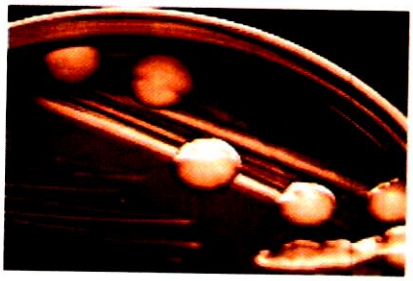
Click for "Microbes After Hours" videos

for cloning DNA and could provide a way to deliver gene therapy.
:::more:::

Microbial Mergers

Mergers and collaborations on a minute scale paved the way for higher life forms. Today, symbionts (the scientific terms for these mergers) help fertilize plants, construct coral reefs, and help us digest food.
:::more:::

FEATURED IMAGE



Lichen image courtesy of Sylvia and Stephen Sharnoff, the Center for Latin American Studies, University of California, Berkeley. Others, courtesy of MicrobeLibrary.org.

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FEATURED VIDEO

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by biology

Microbiology
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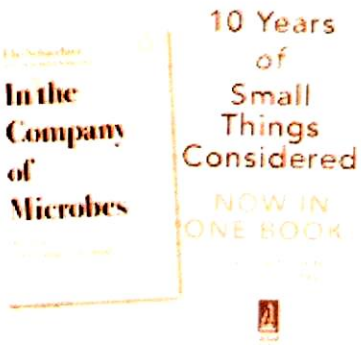

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