

OREGON PUBLIC HEALTH DIVISION • OREGON HEALTH AUTHORITY

MENINGOCOCCUS SEROGROUP B: STILL THERE, STILL DANGEROUS

For the history buffs out there, several previous issues of the *CD Summary* have described temporal spikes in meningococcal infection here in Oregon, the most recent just 3 years ago ([CD Summary, Feb. 14, 2012](#)). This issue reviews how the current outbreak of serogroup B meningococcal disease at the University of Oregon (U of O) has unfolded, and introduces the newly available serogroup B vaccines.

MENINGOCOCCAL PRIMER

Meningococcal disease is a severe and frequently fatal infection caused by the aerobic, Gram-negative diplococcus *Neisseria meningitidis*. Infection may manifest as meningitis or as bacteremia with petechial rash and sometimes *purpura fulminans*. Without prompt antibiotic treatment, meningococcal disease is essentially 100% fatal. Even with antibiotics, the fatality rate among cases reported in Oregon during 2005–2014 was 8.5%, and some who survive are left with hearing loss, mental retardation, or loss of limbs.

Fortunately, meningococcal disease has declined steadily in the United States over the past 20 years, to recent annual incidences 0.3–0.5 cases per 100,000 population. This is in spite of carriage rates of 5%–10% in many communities.¹ A key risk factor for illness appears to be recent colonization, and household members of cases have an attack rate 500–1,000 times higher than the general population.² This is the rationale for postexposure antibiotic prophylaxis* of close contacts.

Meningococci come in 13 flavors, called “serogroups,” based on the antigenic properties of their polysaccharide capsules; of these, serogroups B, C, and Y each cause about one third of cases in the United States.³ Quadrivalent polysaccharide and conjugate vaccines have been available in the United

States to prevent disease caused by serogroups A, C, Y and W135.

SEROGROUP B

For more than 20 years, serogroup B has been the most common in Oregon. Its incidence has fallen steadily since its 1996 peak (Figure 1), and in recent years has given way to serogroup C (Figure 2, *verso*). Because its polysaccharide is poorly antigenic, a vaccine against serogroup B meningococcus has been elusive. Since October 2014, however, FDA has licensed two such vaccines: *Bexsero*® (a two-dose series) and *Trumenba*™ (three doses). Because serogroup B disease has become rare (0.06 cases/100,000/year nationally), no studies of vaccine effectiveness have been completed; evidence for efficacy is based on immunogenicity and *in vitro* killing of serogroup B meningococci by vaccine-induced antibodies. On February 26, 2015, CDC’s Advisory Committee on Immunization Practices (ACIP) voted to recommend the vaccine for limited groups (Box, right)

U OF O OUTBREAK

In early January 2015, a U of O undergraduate student who lived off campus developed fever, hemorrhagic conjunctivitis, and a non-blanching rash, but no symptoms of meningitis. Blood cultures yielded *Neisseria meningitidis*, serogroup B. Lane County Public Health staff identified close

Provisional ACIP MenB vaccination recs

A serogroup B meningococcal (MenB) vaccine series should be administered to persons aged ≥10 years at increased risk for meningococcal disease. This includes:

- Persons with persistent complement component deficiencies;**
- Persons with anatomic or functional asplenia;†
- Microbiologists routinely exposed to isolates of *Neisseria meningitidis*;
- Persons identified to be at increased risk because of a serogroup B meningococcal disease outbreak.

** including inherited or chronic deficiencies in C3, C5–9, properdin, factor D, factor H, or taking eculizumab (Soliris®)

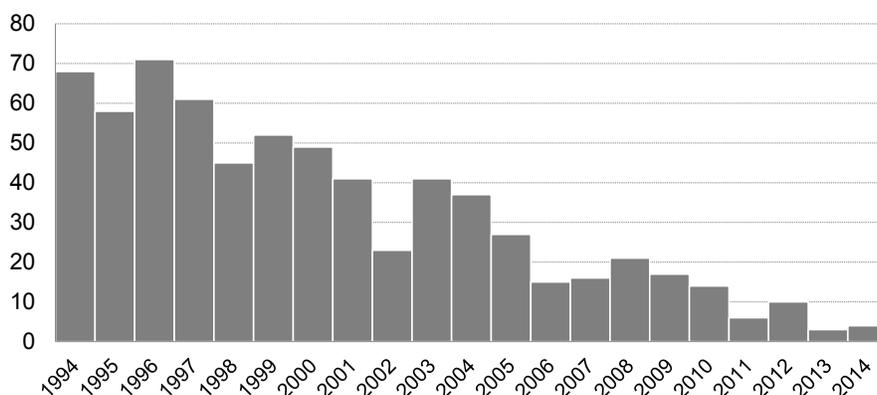
† including sickle-cell disease

contacts and arranged for antimicrobial prophylaxis.

Seventeen days later, a student who lived on campus developed signs of meningococcemia, which diagnosis was confirmed by blood culture yielding *N. meningitidis*, serogroup B. Again, Lane County Public Health worked with U of O to identify close contacts and arranged prophylaxis. No epidemiologic link between the two ill students could be identified.

The day after the second student fell ill, a third U of O undergrad developed malaise and possible fever.

Figure 1. Serogroup B meningococcus cases, by year, Oregon, 1994–2014



* Generally, with rifampin, ciprofloxacin, or ceftriaxone

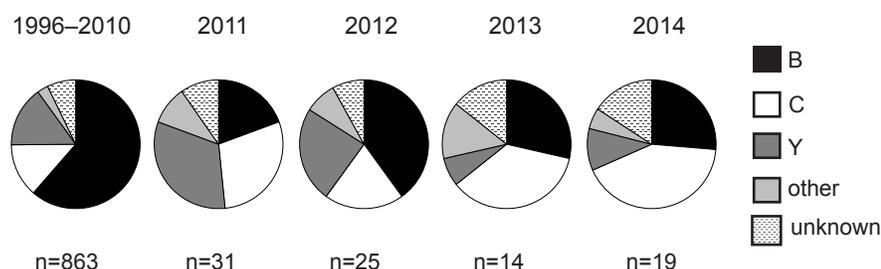


If you need this material in an alternate format, call us at 971-673-1111.

The **CD Summary** (ISSN 0744-7035) is published fortnightly free of charge and is now delivered by e-mail. To sign-up, zap your request to cd.summary@state.or.us. Please include your full name and mailing address (not just your e-mail address)

EARN FREE CME CREDIT. CME credits will be available shortly. See http://healthoregon.org/cd_summary for more information.

Figure 2. Distribution of meningococcal serogroups by year of onset, Oregon, 1996–2014



Student 3 presented for medical evaluation several days later and was admitted to hospital, where serogroup B meningococemia was confirmed. An epidemiological link was identified with one of the earlier ill students. Close contacts were given antimicrobial prophylaxis.

Two and a half weeks later, another student developed severe meningococemia and died. CDC recommends that broader community vaccination be considered when there have been ≥ 3 cases of infection by a single meningococcal serogroup within a 3-month period, *without* direct epidemiological links between the cases, and yielding an attack rate of >10 cases per 100,000 in the community at risk.⁴ The lack of direct links between cases implies that the infection has escaped the ring of antimicrobial prophylaxis and signals risk to the broader group: the cat has gotten out of the bag.

Vaccines were offered to students at the Student Health Service and then through local pharmacies. The U of O arranged for vaccinators and undertook a mass vaccination campaign using Trumenba™ at the campus basketball arena March 2–6. Through the Student Health Service, Lane

County Public Health, pharmacies, and the mass vaccination effort on campus, ~8,800 students were immunized. Despite school being in session, news of the event ubiquitous on campus, mass vaccination clinics, and incentives of free t-shirts, store gift cards, and, yes, even pizza, $>13,000$ students remained unvaccinated.

Two more cases of serogroup B meningococemia have since been confirmed. Vaccination efforts continue, and as of 18 March, 9,193 students had been immunized — 42% of the 22,000 target group.

SPRING BREAK: VACCINATE

March 21–29 is Spring Break at U of O, and we have pleaded with parents of undergrads to seize this opportunity to get the remaining at-risk kids vaccinated (Box, left). Either of the newly licensed serogroup B vaccines (Bexsero® or Trumenba™) can be used. However, students should be encouraged to record the one they get and to stick with the same product to complete the series. Students seeking vaccine outside the Eugene area should call ahead to their local pharmacy, which should be able to obtain vaccine within a day or so if they don't yet have it in stock.

Students might call about adverse events following vaccination; please report these to the Vaccine Adverse Event Reporting System (VAERS) <https://vaers.hhs.gov/esub/index>. If you don't have date of vaccination, lot number, etc. don't worry: we'll work with VAERS to figure it out.

FOR MORE INFORMATION

- See: [2015 Meningococcal update](#) on our website.

Vaccinate U of O students

Recommended for MenB vaccine:

- all U of O undergraduates;
- undergrads from other colleges who live in the “13th & Olive” apartment complex in Eugene; and
- grad students and faculty who either live on campus, or have a medical condition (asplenia, sickle cell disease, or complement deficiency) that puts them at increased risk for meningococcal disease.

REFERENCES

1. CDC. Meningococcal disease. In: Atkinson W, Wolfe S, Hamborsky J, eds. *Epidemiology and Prevention of Vaccine-Preventable Diseases*. 12th ed. Washington, DC: Public Health Foundation, 2011. p. 193–204.
2. Hoek MR, Christensen H, Hellenbrand W, Stefanoff P, Howitz M, Stuart JM. Effectiveness of vaccinating household contacts in addition to chemoprophylaxis after a case of meningococcal disease: a systematic review. *Epidemiol Infect* 2008;136:1441–7.
3. CDC. Prevention and control of meningococcal disease: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 2013;62(RR02):1–22.
4. CDC. Evaluation and management of suspected outbreaks of meningococcal disease. *MMWR* 2013;62(RR02):25–7.