

A UNIVERSITY'S RESPONSE TO AN OUTBREAK OF MENINGITIS



Students who have received the meningitis B vaccine on campus are likely protected from getting sick, *but* can still spread the bacteria to others.

Bacterial meningitis is contagious and is generally spread through:

- Coughing
- Sharing drinks, utensils or smoking materials
- Kissing

It is not spread through casual contact such as shaking hands or sitting next to a person.

Helpful precautions for students and visitors to campus:

- Don't share drinking glasses, smoking materials, eating utensils, cosmetics or lip balm.
- Always cough into a sleeve or tissue.
- Wash hands frequently.
- Use hand sanitizer often.
- Don't drink from a common source such as a punch bowl.

If you feel sick:

- Anyone with a high fever should seek medical attention immediately.
- Students should immediately report to or call University Health Services at 609-258-3141.

Remember: You may become ill with meningitis even if you have not been in contact with someone who is sick.

YOU can help prevent the spread of bacterial meningitis.

For more information, send email to response@princeton.edu or visit www.bit.ly/EHSlips.



PRINCETON UNIVERSITY

Jacqueline Wagner, Princeton University

Topics



- Review of Cases and a Timeline
- Vaccination
- Health Education Campaign
- Concerns
- Lessons Learned

Princeton University - The Basics



- Student Population
 - 5200 undergraduates
 - 2700 graduate students
 - 1200 faculty
 - 11,500 staff (5500 FTE)
- 180 buildings on 500 acres
- 99% undergraduate residency
- 70% grad student residency
- Students from >100 countries
- 185 Principal Investigators
- 600 Laboratories
- Eating Clubs
 - center of student social life



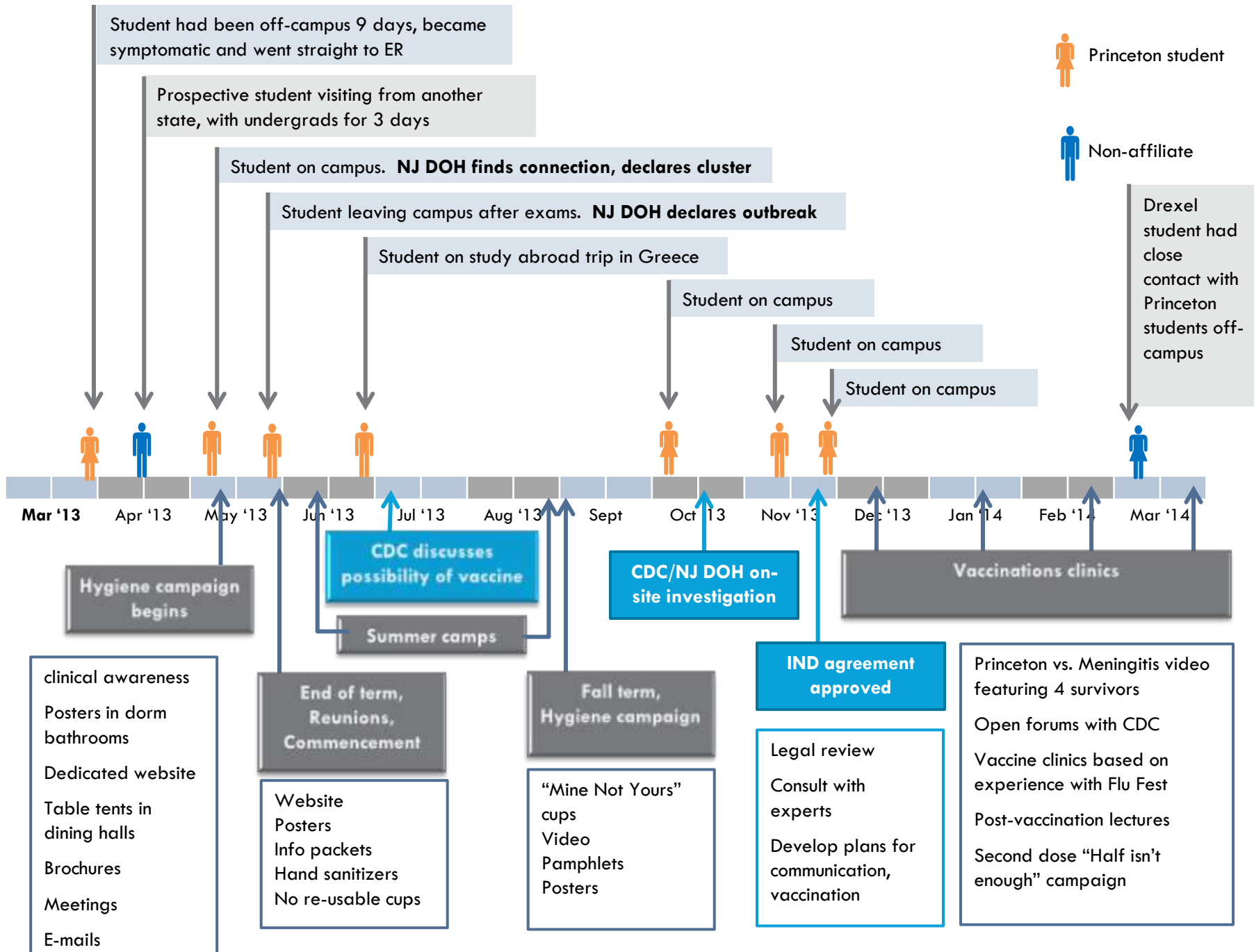
Princeton University – The Basics



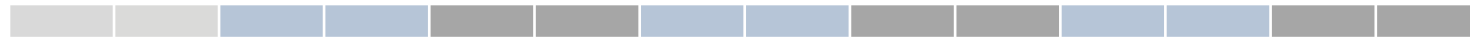
- No professional (medical, vet, dental) schools
- University Health Services provides health care for:
 - Students
 - Staff/faculty – occupational health services
 - Small in-patient unit
- Management of Public Health Emergencies and Communicable Disease Events
 - Medical Director, University Medical Services
 - Director of Environmental Health and Safety

Some experience with communicable disease outbreaks on campus:

Norovirus	2012	305 cases
H1N1	2009 (fall)	579 cases
Pertussis	2009	4 confirmed, 33 suspected
Salmonella	2008	85+



With 9th case, concluded that carriage persisted despite the vaccine.



March '14

April '14

May '14

June '14

July '14

August '14

Sept '14

University cancels on-campus overnight stays for Princeton Preview

Reunions, lawn parties, preparation for summer camps

“Stop the Spread” campaign; Posters, wallet cards to all guests staying on campus during reunions

Vaccinations clinics
Freshman Scholars, Athletes, Incoming Freshmen

Princeton researcher initiates serum study to evaluate immunogenicity of vaccine in college-aged students.

New round of public health messaging

Serogroup B

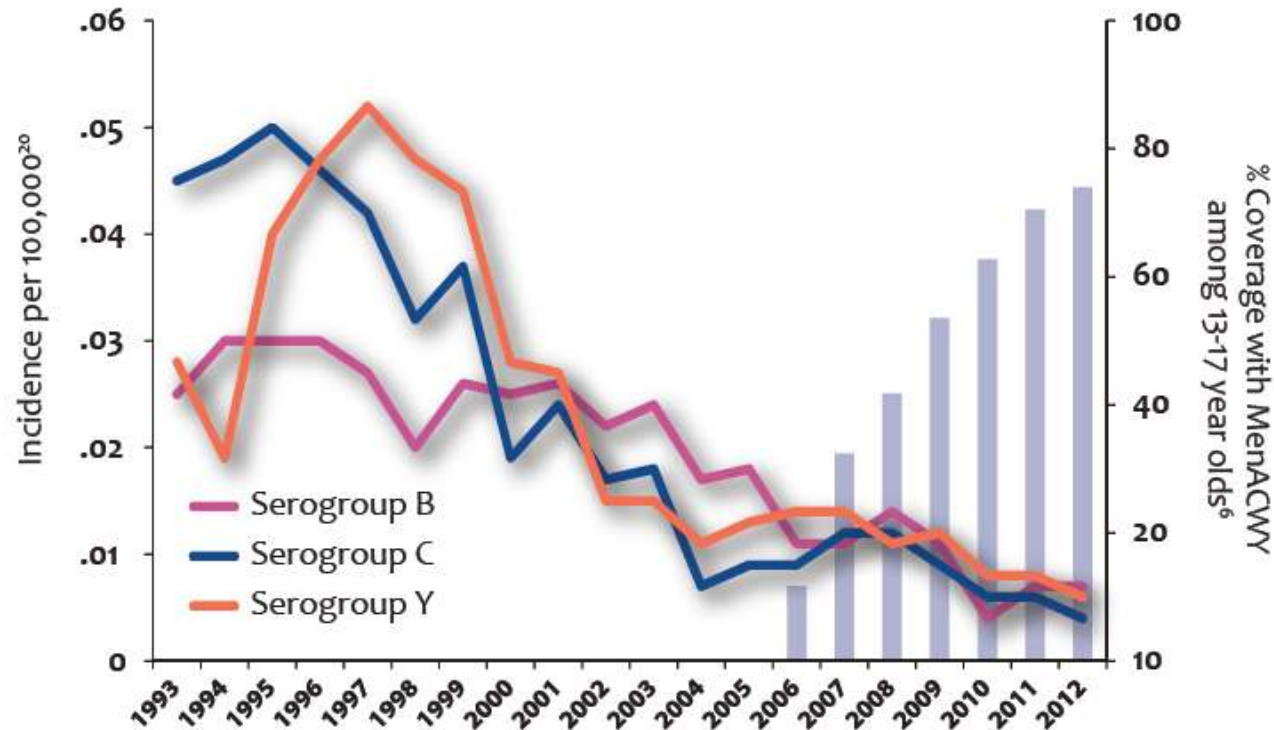


- Prior to 2005, most outbreaks on college campuses caused by serogroup C
- Approximately 30% of all meningococcal disease cases and 25% of outbreaks caused by serogroup B in U.S.
- Accounts for 85-90% of meningococcal disease in the UK

Serogroup B



Incidence by Serogroup and Vaccine Coverage –
1993-2012

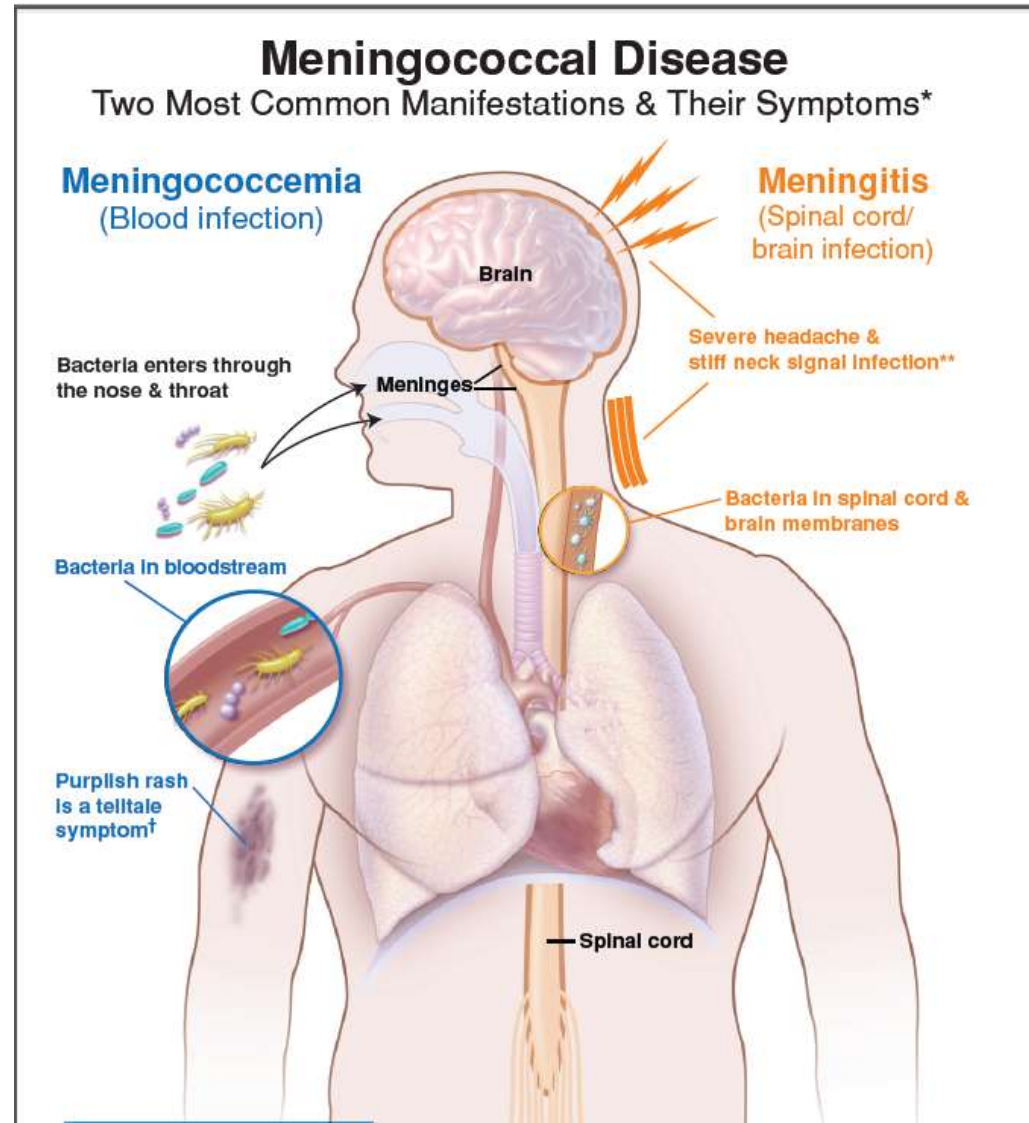


ABCs cases from 1993-2012 estimated to the U.S. population with 18% correction for under reporting²⁰
National Immunization Survey – Teen; 2006-2012⁶

Serogroup B



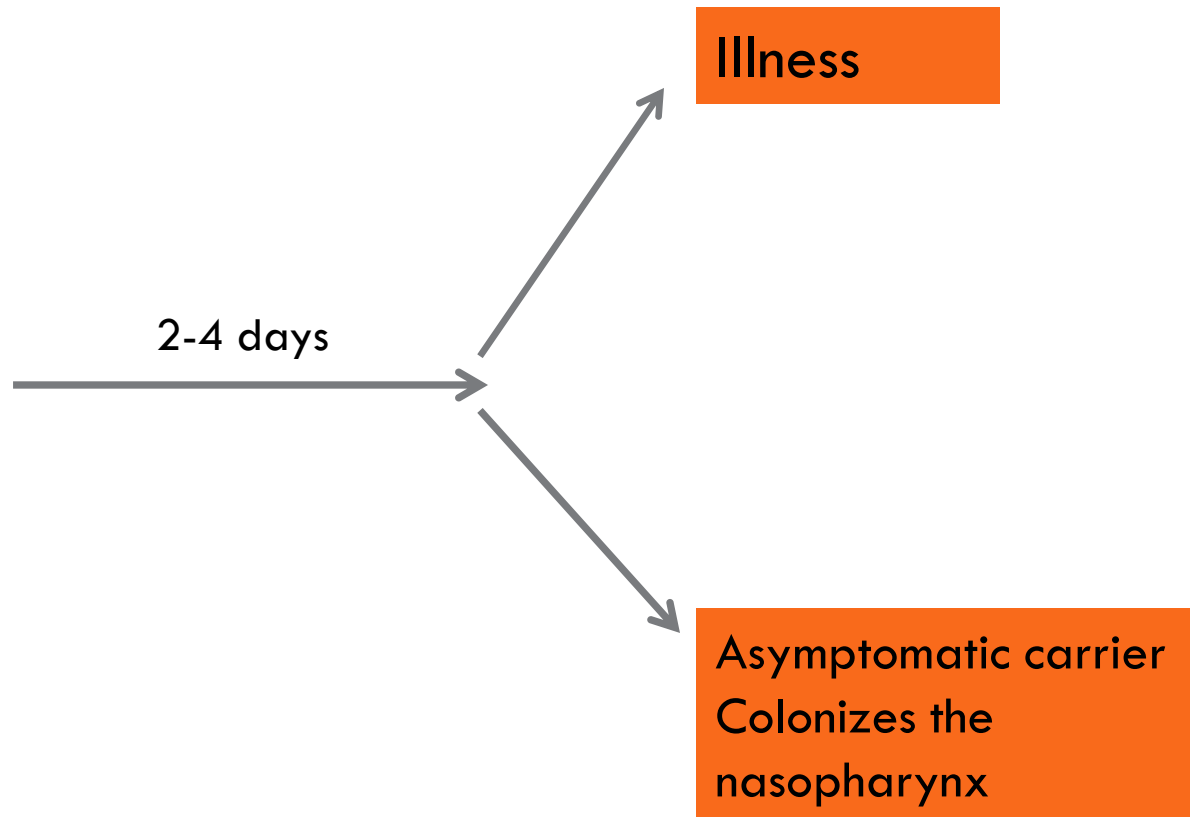
- Not covered by conjugate vaccine
 - ▣ No licensed vaccine for B in US
 - ▣ Licensed vaccine in Europe and Australia, now Canada
- Lives in nose and throat
- 15% death rate
- 20% of survivors serious sequelae
- Causes 30-40% of disease in U.S. and up to 80% in Europe.



Serogroup B



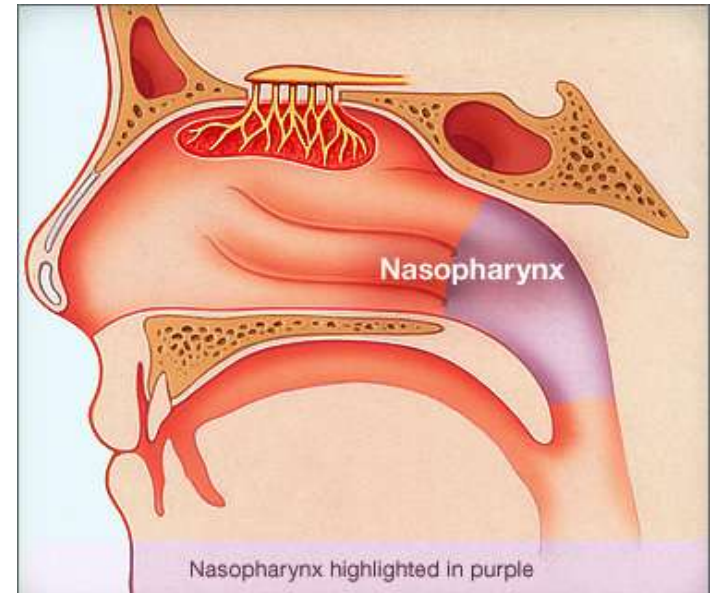
Transmission – large droplet



Meningococcal Carriage



- Few carriage studies in literature
- Range reported from 5% to 25%
- Relation between disease incidence and carriage is unclear.
- Carriage is transient and varies by age and setting
 - Household contacts of persons with disease
 - Military personnel
- Review article⁺ examining carriage of all serogroups:
 - Most important factor is age
 - Peak at 19 years old
- social behavior and carriage in British teenagers ⁺⁺
 - risk for carriage ↑
 - attendance at pubs
 - intimate kissing
 - cigarette smoking



Source: www.webmd.com

Does Vaccination Affect Carriage Rates?

⁺Christenson et al, 2010

⁺⁺MacLennan et al, 2006

Other novel serogroup B outbreaks



Limited experience with meningococcal disease outbreaks caused by serogroup B on University campus settings

University A 21,000 students

13 reported cases
1 fatality

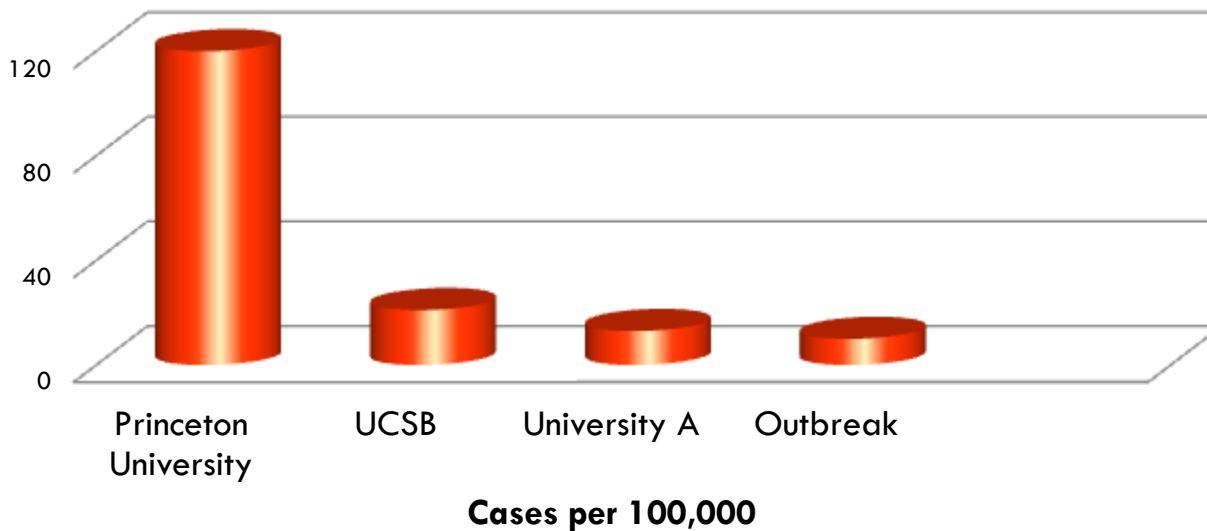
January 2008  November 2010

- No single location associated with transmission
- Factors significantly associated with disease:
 - Greek society membership
 - >1 kissing partner
 - attending bars

Attack Rates



Comparison of Attack Rates



Princeton's Outbreak

- Largest in recorded history based on population size
- Most outbreaks stop after 4 cases
- High attack rate
- Cases continued after end of 2013 academic calendar year
- Novel strain – not seen before in the U.S.

Vaccines



No licensed vaccines for serogroup B in U.S.

Novartis: Bexsero® Recombinant MenB

- Licensed outside of the U.S.
- 2 dose series in adolescents
- Used in vaccine campaigns at Princeton University and UC Santa Barbara



Pfizer: MenB vaccine in development

3 dose series in adolescents

Breakthrough Therapy Designation – expedites review of drug

Expect vaccines to be licensed by Spring 2015

Is vaccine effective?



Vaccine for Serogroup B is not expected to be protective against all strains:

- predicted that 66% of MenB strains circulating in U.S. covered by Bexsero

Bexsero: effective against strain circulating at Princeton University

After two doses of the vaccine:

- at least one month apart and up to six months apart
- 99-100% of adolescents are seroprotected by bactericidal antibodies.

Adverse Events: In trials, generally well tolerated when compared to placebo

- Injection site pain, redness, swelling, malaise, myalgia and headache

The Vaccine – Who Gets It?



Determined by CDC after a week-long, on-campus epidemiological study in October 2013

No patterns involving student residence, social activities, sports teams identified during study

CDC recommends vaccine for the following groups:

- All undergraduate students
(All Princeton cases were undergraduates living in dorms.)
- All graduate students who live in dormitory settings
 - Dorm living is a risk factor, most grad students in dorms were <25 years
 - Intimate partners of grad students who share a dorm room.
- Faculty, staff and students with spleen problems or a specific, rare autoimmune disease

Process of Obtaining the Vaccine



Considered a Treatment Protocol, not a Drug Trial.

- Submission of IND protocol – November 2013
- CDC used the FDA Investigational New Drug (IND) process
IND: off-label and unlicensed uses of drugs
- CDC developed:
 - safety monitoring plan
 - consents
 - vaccine information sheets
 - data collection instruments
- Approved by CDC IRB and FDA in November 2013
- Princeton was required to identify a local co-investigator and participate in safety follow-up activities.
- Princeton University President accepted CDC's recommendation to offer the vaccine.

Obtaining the Vaccine



Regular (3xweekly) conference calls:

- Princeton Team
- Novartis
- NJ Department of Health
- CDC

Expert Consultants

- Vaccine expert – Princeton professor, former chair of Merck vaccines
- Meningitis expert from U.S.
- Chair of meningitis vaccine committee at U.K.

**Vaccine
Procurement**

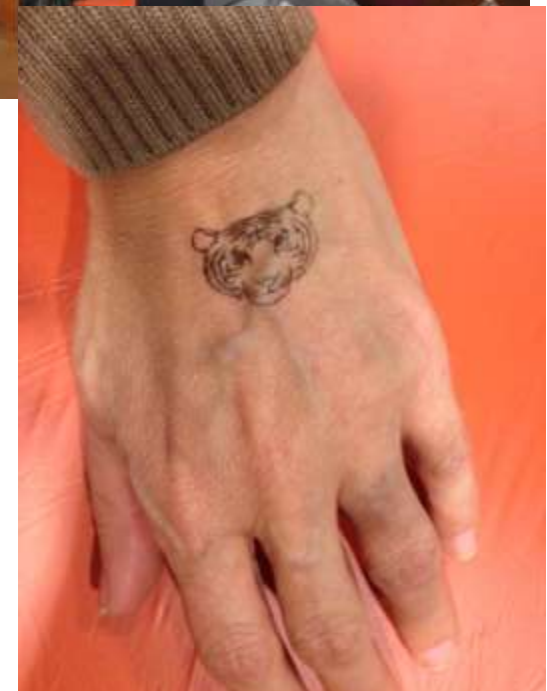
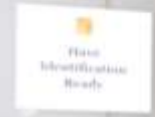
**Vaccine
Storage/Cold Chain**

**Clinic
Logistics**

Legal

Carriage Study

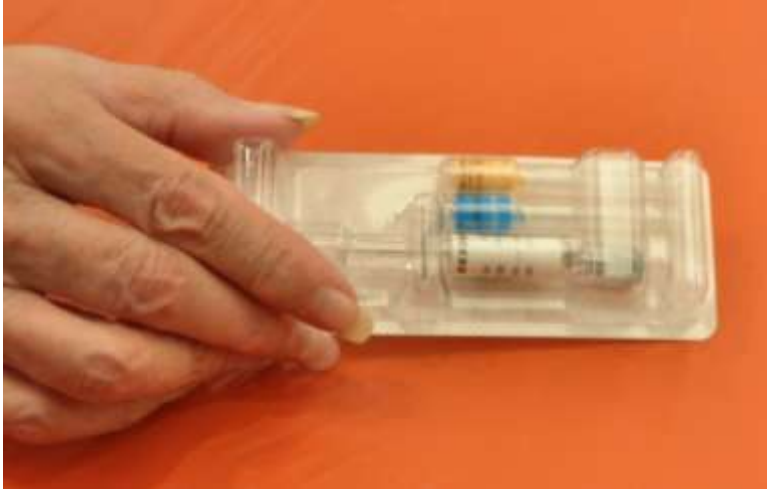
Vaccine Clinic Logistics – Get Screened



Fill out consent forms and talk to
CDC if you have questions...



Get your vaccine



Wait 15 minutes to assess for reactions



Hand in your form.....



Vaccine Acceptance Rates



Constituency	First Dose	Second Dose
2018	96% (1266)	4% (59)
2017	99% (1285)	94% (1220)
2016	98% (1321)	92% (1238)
2015	98% (1300)	91% (1201)
2014	96% (1232)	91% (1170)
Graduate Students	82%	67%
Faculty/Staff/Other	100% (17)	82% (14)

Undergraduate Student Vaccine Acceptance Rates:

First Dose **98%**
Second Dose **75%***

***Most incoming freshmen won't be eligible for second dose until October, 2014.**

Communications Campaign



Initial Campaign – Spring, Summer 2013

- Behaviors that result in transmission
- Recognition/early reporting of symptoms
- Strain circulating on campus not covered by vaccine

Campaign for First Vaccine Clinic (Nov 2013)

- Who
- Where
- When
- Why

Second Dose Vaccine Clinic (January-April 2014)

- Importance of Second Dose

After 9th case:

- Symptom Recognition
- Can still spread disease even if vaccinated



The Communications Campaign



- Website →
- Emails (**parents**, students)
- Pamphlets
- Posters
- Table tents
- Videos
- Text messages
- Open forums for students to meet with CDC representatives
- Student newspaper (Daily Princetonian)



Search
Home

Emergency
Guidelines for
the Campus
Community

Emergency
Guidelines
Princeton University
Emergency
Preparedness
Page
News & Events

Facilities
Health Services
Public Safety
Env. Health & Safety
University Travel

Princeton University



Emergency Guidelines for the Campus Community

Meningitis Information

Last update: August 25, 2014

Nine cases of serogroup B meningococcal disease have been associated with Princeton University. The US Centers for Disease Control and Prevention (CDC) and the New Jersey Department of Health are not recommending cancelling or curtailing events or activities on campus.

- **Latest update** updated 8/25/14
- **Questions and Answers** updated 8/25/14
 - University Vaccine Clinics and Outbreak Information
 - **Bacterial Meningitis General Information**
 - **General Clinic Information**
 - **Undergraduate Students**
 - **Graduate Students**
 - **Faculty and Staff**
 - **Admitted Students**
 - **Campus Events**
 - **Visitors and Community Members**
 - **Meningitis B Vaccine Information on the CDC website**
- **Information Resources** updated 5/8/14
- **Communications** updated 8/25/14

Meningitis B Vaccine Clinics

The CDC recommends that all Princeton University undergraduate students and eligible graduate students (see [eligibility requirements](#)) and members of the University community with specific medical conditions, including problems with their spleen (including sickle cell disease) or complement pathway (a specific type of immune deficiency) receive a vaccine that helps protect against meningococcal disease caused by serogroup B bacteria. Between March 2013 and March 2014, nine cases of serogroup B meningococcal disease have been associated with Princeton University. There have been no cases occurring on campus or affecting Princeton students since November 2013.

Initial Campaign Message

- **Transmission**
- **Not protected by vaccine required for incoming students**
- **Symptoms of concern**

Most effective placement of posters:

Inside every dormitory bathroom stall



KEEP HEALTHY AND CARRY ON

Prevent the Spread of Bacterial Meningitis

Meningococcus type B is not in the vaccine.

It is spread through direct exchange of respiratory and throat secretions by close personal contact.

It is NOT spread by:

- Shaking hands
- Breathing the air where a person with meningitis has been
- Touching doorknobs, clothing or linens
- Food

Risky behavior includes:

- Sharing smoking materials
- Sharing water bottles
- Sharing drinking glasses
- Sharing eating utensils
- Sharing cosmetics
- Sharing toothbrushes
- Kissing
- Coughing into another person's face



Students who have high fever, severe headache, stiff neck or a purple skin rash should report to or call University Health Services immediately at 609-258-3141. All others should seek immediate medical attention at the emergency room.



Student Involvement

18
comments

'Mine. Not Yours': Princeton University hands out red cups to curb meningitis, promote safe drinking



By [Jon Offredo/The Times of Trenton](#)

[Follow on Twitter](#)

on September 20, 2013 at 6:30 AM, updated September 20, 2013 at 6:42 AM

Print

10

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104

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2

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PRINCETON — In an effort to avoid a repeat of a bacterial meningitis outbreak that hit Princeton University's campus last spring, the university is distributing 5,000 red, 16-ounce cups emblazoned with a message for students to not share their beverages.

The cups read, "Mine. Not Yours." and include markings for the standard alcoholic drink size for liquor, wine and beer, along with the phone number for the university's department of public safety. They are intended to help curb the spread of meningitis and



Es mi salud. Es mi elección.

Puedo visitar a un especialista sin necesidad de una remisión.

Call 1-888-895-0973 (TTY: 711) and ask for UnitedHealthcare Community Plan.



Video of the Day



Student Involvement



Student Video: Princeton Against Meningitis



Student Involvement – Second Dose Campaign



MENINGITIS B VACCINE CLINIC

FEBRUARY 17 - 20
12 - 8 PM

FRIST CAMPUS CENTER
B LEVEL

TWO DOSES ARE NEEDED FOR MAXIMUM PROTECTION

- FREE for all undergraduate students, and eligible graduate students and eligible employees
- All eligible individuals must sign consent form
- Students under 18 years old must bring permission form signed by a parent/guardian
- First or second dose available
- For information about eligibility visit: <http://bit.ly/MqJ83l>



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Student Involvement – 2nd Dose Campaign



Symptom Recognition and Carriage Awareness Campaign – Spring 2014



Students who have received the meningitis B vaccine on campus are likely protected from getting sick, *but*

can still spread the bacteria to others.

Students, alumni and visitors:

- Don't share drinking glasses, smoking materials, eating utensils, cosmetics or lip balm.
- Always cough into a sleeve or tissue.
- Wash hands frequently.
- Use hand sanitizer often.
- Don't drink from a common source such as a punch bowl.

 PRINCETON UNIVERSITY

Wallet Cards Handed to everyone who Visited during Reunions and Lawn Parties

If you feel sick:

- Anyone with a high fever should seek medical attention immediately.
- Students should immediately report to or call University Health Services at **609-258-3141**.

Remember: You may become ill with meningitis even if you have not been in contact with someone who is sick.



Symptom Recognition and Carriage Awareness Campaign – Spring 2014



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Bacterial meningitis is contagious and is generally spread through:

- Coughing
- Sharing drinks, utensils or smoking materials
- Kissing

It is not spread through casual contact such as shaking hands or sitting next to a person.

Helpful precautions for students and visitors to campus:

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Remember: You may become ill with meningitis even if you have not been in contact with someone who is sick.

YOU can help prevent the spread of bacterial meningitis.

For more information, send email to response@princeton.edu or visit www.bit.ly/EHStips.





Now that the litter
has joined the pack,



let's keep the meng
from coming back!

- Don't share cups, utensils, & cosmetics
- Cough into a sleeve or tissue
- Know that kissing poses a risk
- Wash or sanitize your hands often
- Get both doses of the vaccine

Fall, 2014 Awareness Campaign –Student Messages

Aimed at students as they return
to campus

Spontaneous Student Messages

**WASH
YOUR
MUGS**



*Thanks from:
Murray-Dodge Cafe*

Remember - Only YOU can
**PREVENT
MENINGITIS**



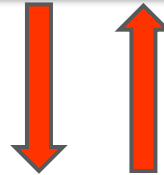
University Leadership and the Team



President Eisgruber



High Level Decision
Makers Authorized by
University President



Operational Leader
Director, EHS

External Partners
-CDC
-NJDOH

Medical Adviser
Medical Director, UHS

Communications/
Health Education

Vaccine
Campaign

Legal Concerns

Training



- Large events staff
- Dining Services
- Building Services (janitors)
- Public Safety
- Athletics
 - Coaches and trainers
- Eating Club managers
- Camp Counselors
- Food Contractors
- Outdoor Action/Community Action Leaders
- RCAs
- Peer Health Advisers
- SHAB (Student Health Advisory Board)



Challenges



End of Academic Year

- Large Events on Campus
- Students Leaving Campus for Areas not Familiar with Outbreak
- Summer Camps on campus



Challenges



Meeting End of Year Challenges

- Teams
Communications
- Reunions/Large Events Liaison Team
- Summer Camps Team
- Ongoing Outreach



Commencement Information



[Commencement Overview](#)

[Commencement Events](#)

[Frequently Asked Questions](#)

[Travel, Lodging & Accommodations for Individuals with Disabilities](#)

[Free-Time Activities](#)

[Graduating Class Committee](#)

[For More Information](#)

[A Note of Caution: Meningitis](#)

Overview

COMMENCEMENT 2014

Welcome to Princeton University's 267th Commencement Web pages. This information focuses on events for all seniors and advanced degree candidates and is updated throughout the year. Please check with your student about activities that he or she is involved with and that might be planning special events around commencement. (Departmental receptions for seniors will be posted this spring.) Key event dates for 2014 are:

Sunday, June 1

- Baccalaureate. 2:00 p.m. Held in the Chapel with seating for guests in simulcast locations near the Chapel, this interfaith service features a guest speaker.

Monday, June 2

For seniors

- Class Day. 10:30 a.m. This event is focused on the senior class and includes a guest speaker. If weather permits, it is held on Cannon Green with a picnic lunch to follow (severe weather location is Jadwin Gymnasium).

- Departmental receptions for majors in the afternoon.

For Advanced Degree candidates

- Dean's brunch at the Graduate College.

- Hooding Ceremony. 5:00 p.m. Held on Cannon Green, weather permitting (rain location which requires tickets is McCarter Theatre).

Tuesday, June 3

Commencement. 11:00 a.m. (guests must be seated by 10:20 a.m.). Granting of degrees and address by President Tilghman. Distribution of diplomas in the Residential Colleges for seniors follows.

Office of the Vice President & Secretary

Challenges

Large Events

Reunions – 25,000 alumni on campus

Alcohol!

CDC/NJDOH: Do not cancel/curtail events

- Make hand sanitizers available
- Make tissues available
- No self-serve ice
- No reusing cups
- Plenty of hands-free trash receptacles



Challenges



Summer Camps

- Sports Camps
- Rec camps
- Academic camps

Athletics

- Watering Systems
- Sharing Bottles

Stay Healthy at Summer Camp

Summer 2013

Princeton University

In Case of Emergency

On campus, call 911 from a landline phone or 609-258-3333 from a cell phone.

The nearest Emergency Department, for use in case of emergency, is

University Medical Center of Princeton at Plainsboro (UMCPP)
1 Plainsboro Road (on Route 1 North)
Plainsboro, NJ
609-853-6500

The nearest Urgent Care Clinic is

Princeton Primary and Urgent Care
707 Alexander Road
Princeton, NJ 08540
609-819-0009
Hours: Monday -Friday 8 am to 7 pm, Sa
9 am to noon



Bring a water bottle with the camper's name on it to camp each day.

Stay Cool

Most of our dormitories are not air conditioned and are not set up to accept portable air conditioners.

Campers are encouraged to bring a fan. All windows are operable and have screens.

We look forward to welcoming you to campus and your participation in Princeton's Sports Camp. The purpose of this advisory is to provide you with information about a recent Princeton University health alert and to give you some tips on helping your camper stay healthy at summer camp.

Between March 22 and May 20, 2013, three Princeton University students and a campus visitor who had been staying with a student were diagnosed with bacterial meningitis and treated. All four cases were caused by meningococcal bacteria known as type B, which has no effective vaccine but can be treated with common antibiotics.

The New Jersey Department of Health and US Centers for Disease Control have not recommended any curtailment of activities on campus, including camps where campers are staying in dormitories.

Additional information regarding meningitis at Princeton is available on the web at web.princeton.edu/site/eme/menccolmeningitis.html and on the opposite page.

Stay Hydrated

Campers can quickly become dehydrated in summer heat, especially when they are active with sports and games. Please ensure each camper brings a refillable water bottle with his/her name on it. Sports drinks containing electrolytes can be helpful when campers will be working out longer than an hour at a time. Choose electrolyte drinks that are low in sugar and do not contain caffeine.

Avoid Sunburn and Protect Eyes

For day camps, apply sunscreen before dropping off your camper. For all camps, ensure your camper brings sunscreen with an SPF of at least 15. Pack a lightweight long-sleeved shirt for particularly sunny days, as well as a hat. If your camper develops sunburn, encourage them to take a cool bath or shower and put a cool wet cloth over the affected area. Apply aloe or an antibiotic ointment, but avoid lotions, as they can trap heat in the skin.

Sunlight, whether direct or reflected off water, sand or concrete, can burn the corneas, causing pain and puffiness. Over time, exposure to UV light from the sun can accelerate aging of the lenses, resulting in early cataracts and other vision problems. Campers can protect their eyes by wearing hats and sunglasses that protect against UVA and UVB.

Prepared by



University
Health
Services



Environmental
Health &
Safety

Challenges



Students Leaving to Study/Travel Abroad

- Approximately 800 students
- Remote travel locations, access to quality health care not always available

Response

- Letter to all travelers
- Scripted advice for healthcare providers
- Cipro prescription



Concerns – Carriage and Prophylaxis



- **Close** contacts of Princeton cases received one dose of Cipro
- Pressure to provide Cipro to everyone on campus to address carriage
- Princeton has followed guidance from CDC and NJ DOH
 - Advise against mass prophylaxis to stop carriage
- UHS Medical Director consulted with public health and meningitis experts around the world on issue of antibiotic prophylaxis:
 - No right answers



Photo Source: www.popularpills.net

Concerns-Carriage and Prophylaxis



Advisory Committee on Immunization Practices (June, 2014)

- Literature review:
 - Limited data available
 - Some studies show decrease in carriage, but can return over time
 - Does it prevent additional cases?

- Mass chemoprophylaxis for meningococcal outbreaks
 - Small/closed populations
 - Easy to administer antibiotic quickly to entire population
 - Closed population

- Challenges - many
 - Costs
 - Side effects, drug interactions
 - Antibiotic resistance
 - Covering the population at risk quickly
 - Who is the at-risk population?

What We Learned From Students



Despite messaging:

- 42% thought subgroup B was covered by vaccine or didn't know.
- Thought meningitis was no more dangerous than the flu or norovirus.

Focus groups facilitated by Kathy Wagner, UHS

- E-mail is best, but “If the information isn’t at the top, we probably won’t see it.”
- Avoid “wall of text.” Use bullets, keep it short.
- Give the most important info in the first two sentences, even if it seems awkward.
- Posters in the bathrooms get most attention.
- Use social media sparingly.
- Use text messages only when an immediate action is expected.
- Table tents can be effective, but in conjunction with emails and posters.
- Giveaways get attention.

Lessons Learned



- Need University Leadership engaged and involved
- Student involvement was key to success of vaccine campaigns
- Clarify roles when setting up teams and assigning tasks.
- Seek advice from external experts.



Acknowledgements



Robin Izzo, Director, Environmental Health and Safety

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