

Side Effects from Ciprofloxacin following Meningococcal Disease Prophylaxis in a High School

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Presenter Disclosures

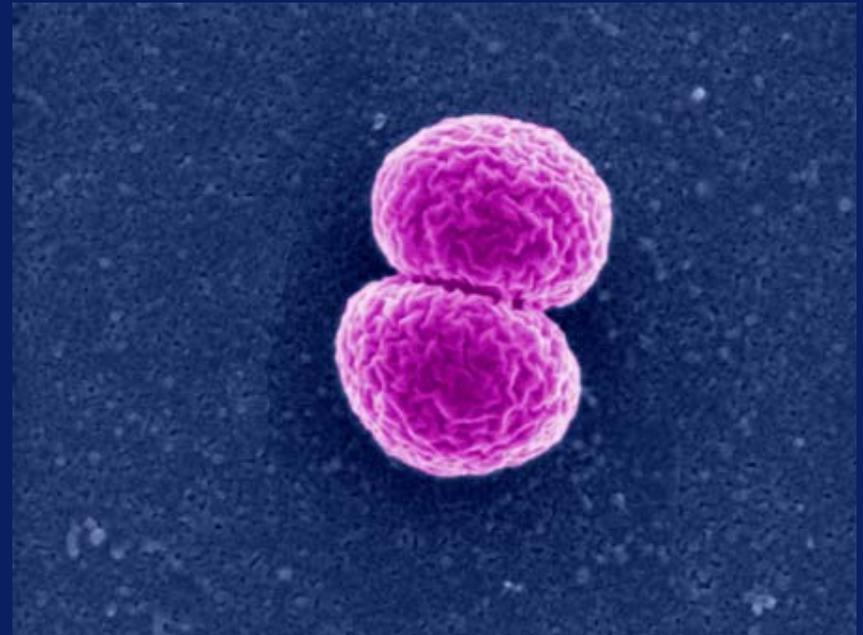
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No relationships to disclose.



Meningococcal Disease (MD) Etiology

- Gram-negative diplococcus, *Neisseria meningitidis*
- Human reservoir: mucosal surfaces of nasopharynx
- Transmission: direct contact of droplet secretions



Meningococcal Disease Presentation

- Sudden onset of fever, headache, stiff neck, petechial rash, delirium, coma
- Morbidity and mortality
 - 10-14% of cases are fatal
 - 11-19% have permanent hearing loss, mental retardation, loss of limbs



Meningococcal Disease Reporting

- Nationally Reportable Communicable Disease
- Diagnosis based on clinical suspicion and bacteriology
 - Confirmed: culture positive isolate from a sterile site
 - Probable: PCR positive, gram-stain, or CSF antigen test with compatible clinical syndrome
- Role of Department of Public Health (DPH)
 - Conduct surveillance
 - Serogroup culture positive isolates
 - Serogroups A, C, Y are vaccine-preventable
 - Counsel close contacts on symptoms and offer prophylaxis





Background

- Nov 2006 - Two students reported to DPH with invasive MD in a single day from local hospital
- Same high school (HS) and same-day onset
 - 1st case: culture-confirmed in blood
 - 2nd case: PCR-positive in CSF
- Different grades, did not share common classes, activities, or social circles
- Both were serogroup B, not vaccine-preventable



Background (cont.)

- Two point of distribution (POD) clinics assembled by district field services and HS officials
 - Parents, students, and staff were notified via phone message and letter
 - 1st clinic held the evening of notification and 2nd clinic held the next morning
 - Names of cases released, but not until the 1st clinic was already underway
 - Single-dose ciprofloxacin (500mg) provided to 2861 students and teaching staff



Mass Prophylaxis vs. Prophylaxis of Close Contacts

- Mass prophylaxis in limited situations
 - CDC criteria
 - Three or more cases in three months
 - Institutional setting such as school or military
 - Risks of prophylaxis
 - Number of people who may develop side effects
 - Possible development of antimicrobial resistance
- Why a POD clinic?
 - Close contacts could not be identified in a timely manner
 - Extent of carriage unknown



Objectives of Follow-up Survey

- Side effects of single dose ciprofloxacin in adolescents
 - Joint problems
 - Allergy/anaphylaxis
- Motivations for attending POD clinic
 - How many were actual close contacts?
 - What was their perception of risk of MD?
 - Did the media influence the decision to attend?



Survey Contents

- Limited to a one page survey, developed for all students
- Content included:
 - Demographics
 - POD clinic attendance: when and why
 - Side effects of prophylaxis
 - Type of contact with case students
 - Health status at the time of the POD clinic
 - Risk perception of various health conditions (e.g. avian influenza, traffic accidents)

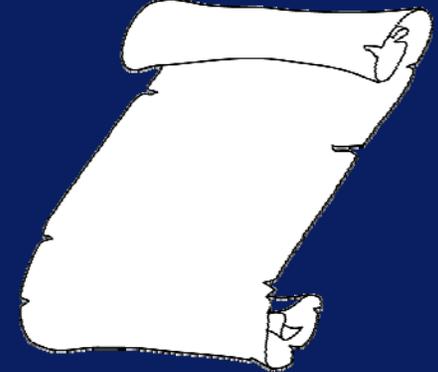


Survey Methods

- Parents, students, teaching staff notified of follow-up survey one week post-clinic
- Survey distributed by teaching staff during a homeroom period the following week
- Data analyzed using SAS 9.1



Results



**2888 Students
in HS Population**

**1649 (57%)
Completed Surveys**

**1624 (98%)
Surveys Analyzed**

**25 (2%)
Surveys Excluded**

**1445 (89%)
Attended
POD clinic**

**179 (11%)
Did Not Attend
POD clinic**

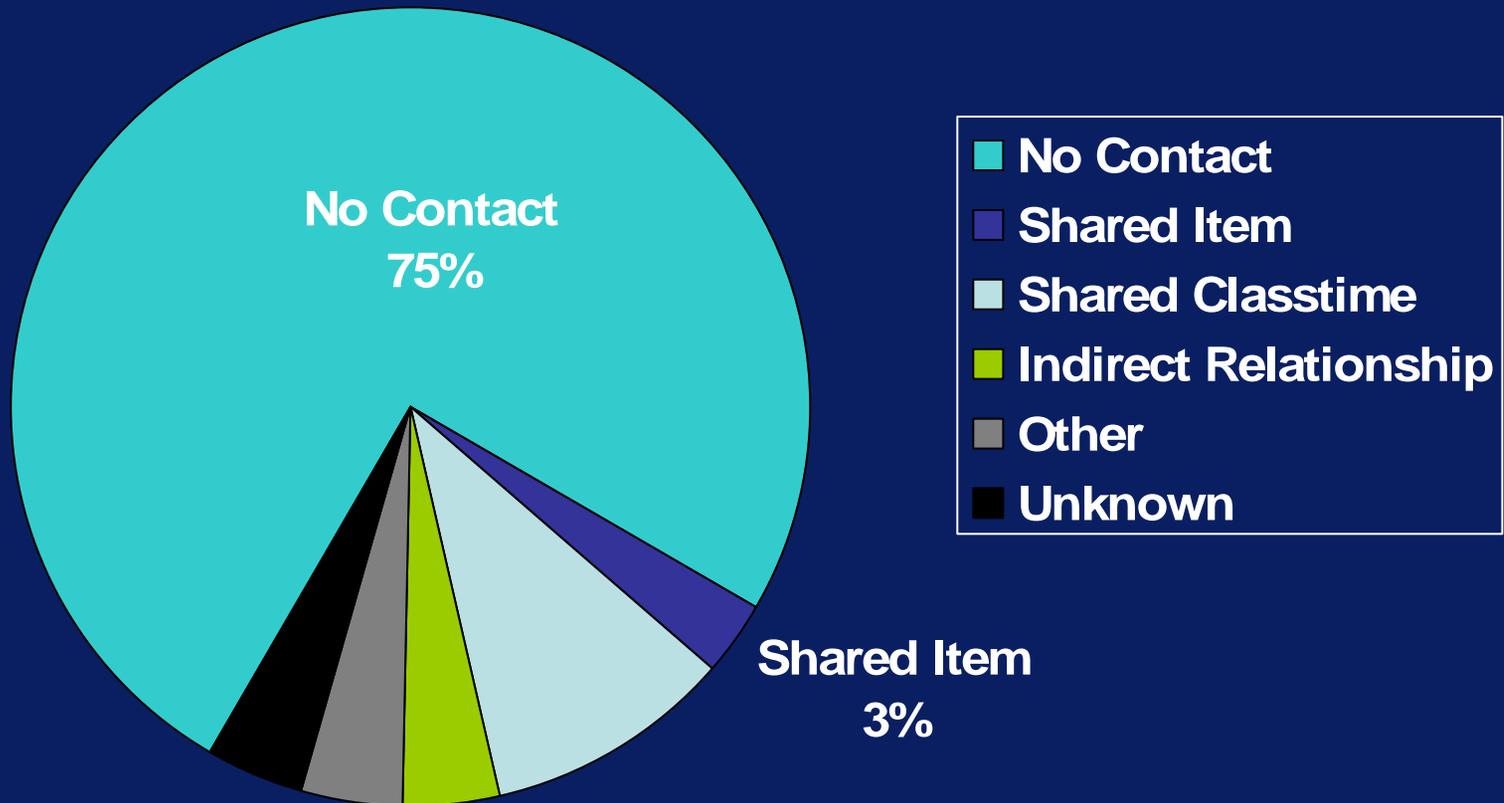


Demographics of Surveyed Students

		Total	POD Clinic Attendance	
			Yes n (% of Total)	No n (% of Total)
All		1624	1445 (89)	179 (11)
Gender	Male	795	689 (87)	106 (13)
	Female	817	745 (91)	72 (9)
Grade	9 th	419	366 (87)	53 (13)
	10 th	440	385 (88)	55 (12)
	11 th	459	416 (91)	43 (9)
	12 th	282	266 (91)	26 (9)
Race	Asian	530	480 (91)	50 (9)
	Black	27	20 (74)	7 (26)
	Latino	135	117 (87)	18 (13)
	White	799	714 (89)	85 (11)
	Mixed/ Other	104	88 (85)	16 (15)

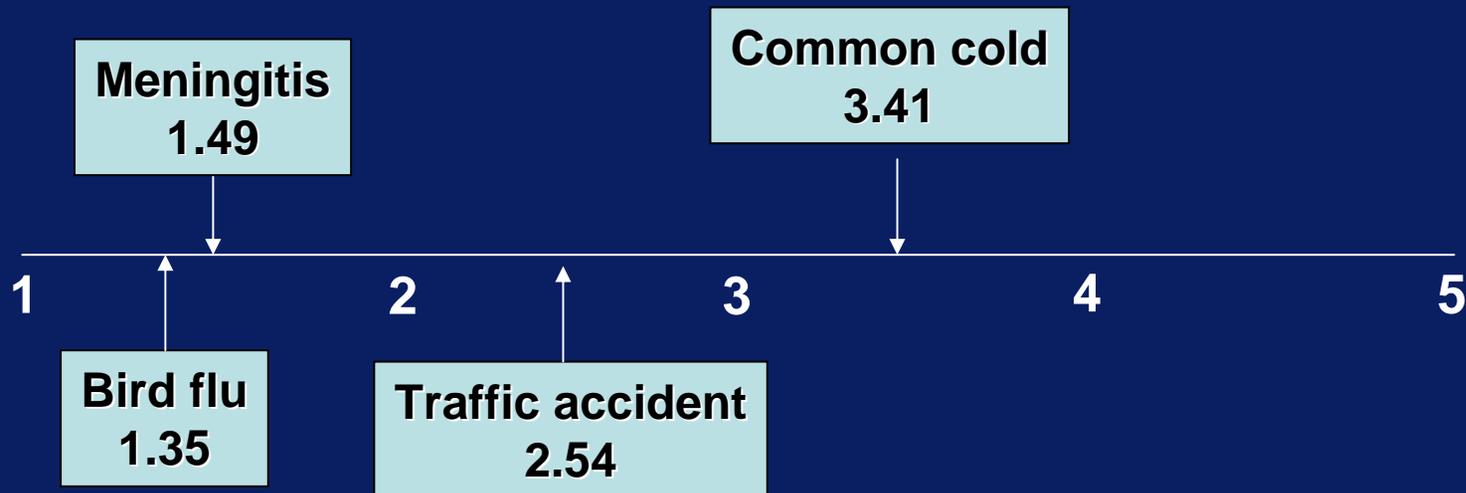


Type of Contact with Cases



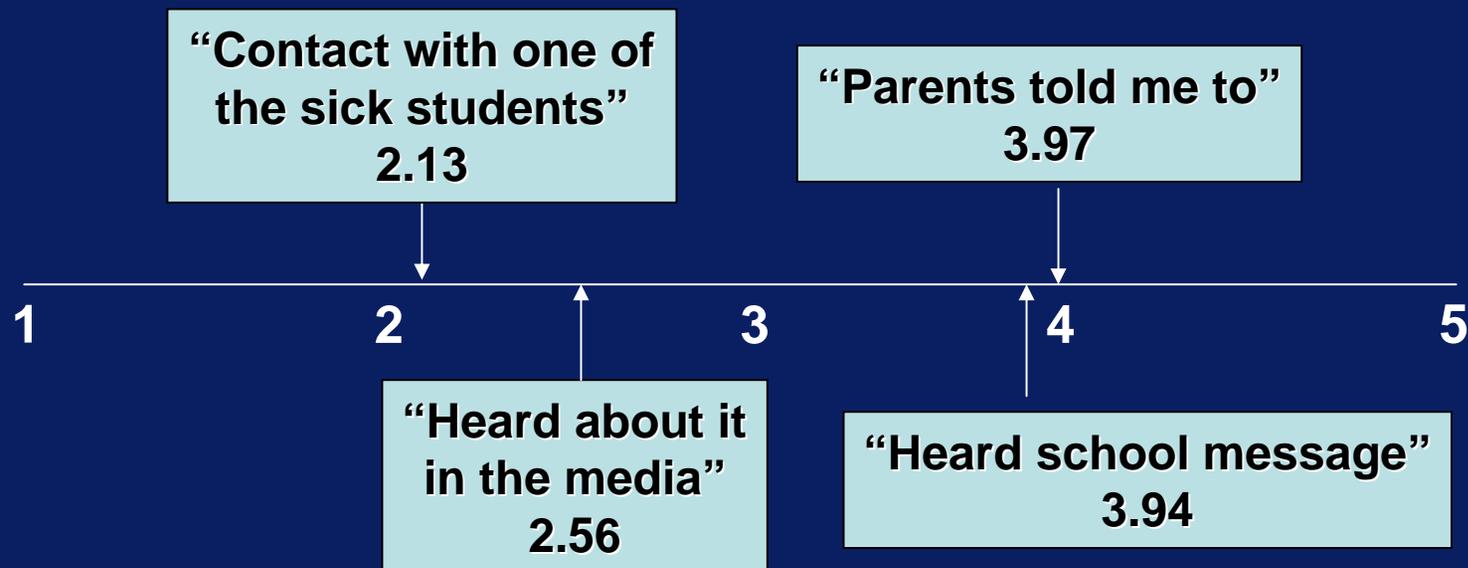
Perceived Risk of Health Conditions

- Rated on a 1 to 5 scale
 - 1 not likely
 - 5 very likely

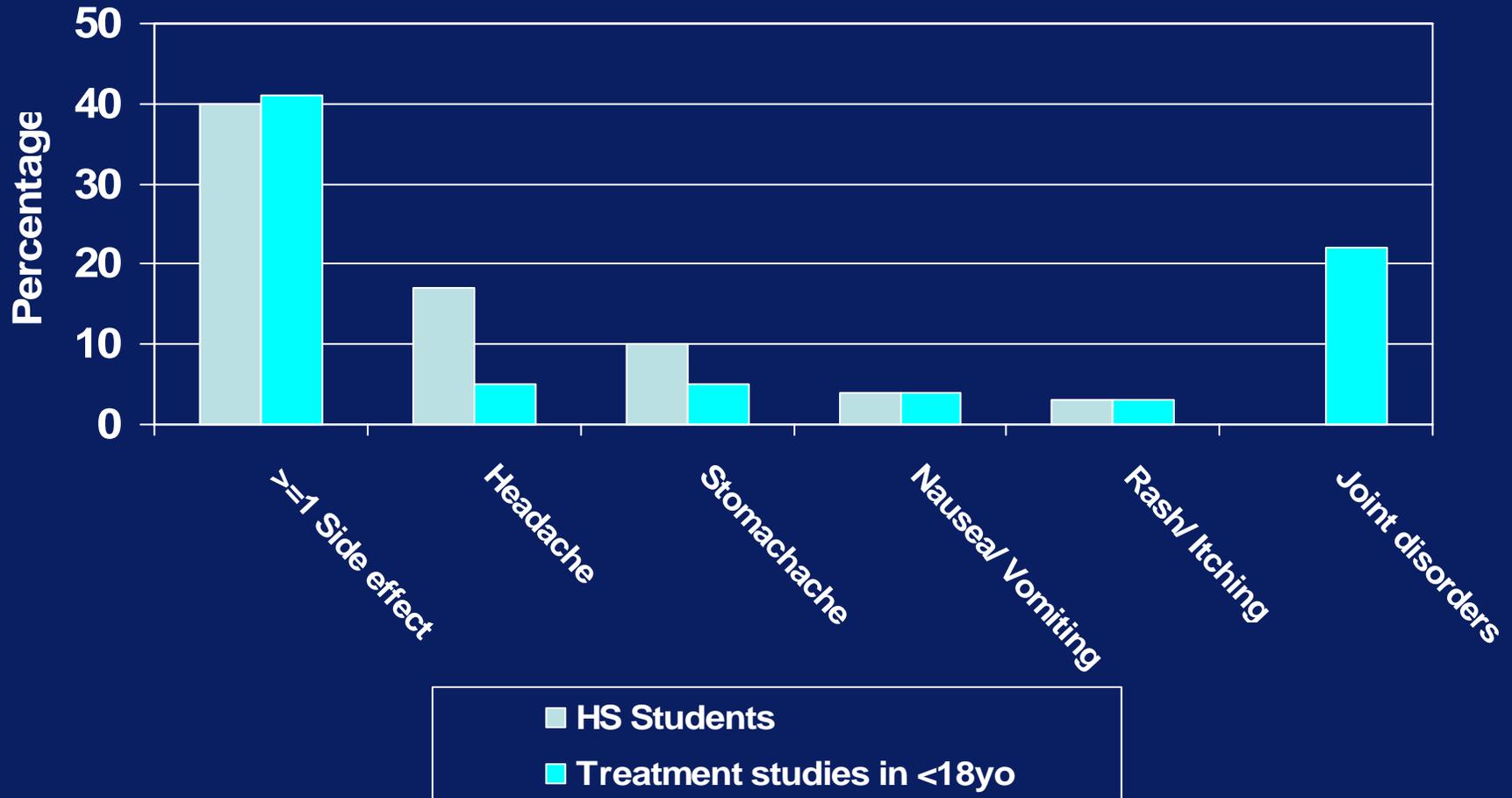


Reasons for Clinic Attendance

- Rated on a 1 to 5 scale
 - 1 not important
 - 5 very important



Side Effects of Ciprofloxacin Among Pediatric Studies



Hospitalized v. Healthy Study Populations

- Pediatric studies often involve ill patients
 - Interactions with other substances (e.g. caffeine or nicotine) less common
 - Superior ability to detect joint disorders
 - Greater dosage, longer treatment and follow-up time in side effect evaluation
- In healthy persons, a mistaken attribution of bodily symptoms for “side-effect”



Limitations

- No placebo group to control for side effects from substance interactions and background prevalence of illness
- Recall bias: survey implemented two weeks after POD clinic
- Survey self-administered
 - No presence of public health staff
 - Validity of reported side effects may be questionable
- Low response rate (57%)



Conclusions: Single Dose Ciprofloxacin

- Study in a healthy pediatric population
- Frequency of side effects within range of published studies (40%)
- Headache and stomachache most common
- Allergy-related symptoms
 - Detected additional events
 - Two cases of rash reported prior to survey
- No joint-related problems with single dose ciprofloxacin



Conclusions for Public Health

- Health departments should work with schools to prepare risk message
 - Students understood their low risk
 - Students motivated by parents and the advice of school officials, not media
- Successful experience in putting to practice bioterrorism and response related exercises



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