STD epidemiology in NYC; focus on the adolescent

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Today's talk

- Legal mandate to report
- NYC Sexually Transmitted Diseases (STD) control program
- Basic reproductive rate
- Epidemiology of the 'Big Three' (Chlamydia, Gonorrhea, Syphilis)
- Three "burning" issues
  - Expedited partner therapy for CT in NY State
  - Emergence of cephalosporin-resistant GC, new tx recommendations
  - EpiQuery: online STD data for NY City

Legal mandate to report

- By law, clinical laboratories and providers performing STD testing for NYC residents must report 7 STD to Bureau of STD Control
- Required:
  - Labs: patient name, dob, address, race/ethnicity, diagnosis, laboratory test result/date, submitting provider, provider address
  - Providers: information on the provider report form

Why are certain diseases/conditions reportable?

- Disease represents a significant public threat
  - Need for immediate public health response (Ex. meningococcal disease, anthrax)
- Public health response critical to preventing subsequent disease/ injury control
  - Ex. Syphilis, HIV partner elicitation and notification
  - Ex. Outbreak, dangerous intersection, faulty device
- Occurrence of disease is a 'sentinel event"
  - Represents failure of clinical management, public health interventions (Ex. Congenital syphilis)
- Monitor trends in behavior, identify groups with increased risk
  - Assess need for, direct resources for interventions, health communications
- Measure effect of interventions (Ex. vaccine campaigns, HAART, screening coverage)

Who reports and how?

- **Providers** report using a case report form
  - On paper
    - 'Universal report form (URF)'
    - URF URL: http://www.nyc.gov/html/doh/html/hcp/hcp-urf.shtml
  - By phone
    - Call Provider Access Line (PAL): 1-866-NYC-DOH1
    - Call 212-788-4423 and ask to speak with someone who can take an STD case report
  - Electronically
    - Contact Rugiatu Jalloh at rjalloh@health.nyc.gov or 347-396-6008 to arrange for training in web-based reporting
- **Clinical laboratories** report lab results electronically

No. cases reportable STD in NYC, 2011

Pathogen/Disease	Total	Female	Male	*(%) Male*
Chlamydia trachomatis (CT)	**64,966**	43,682	21,206	*(33)*
Neisseria gonorrhoeae (GC)	**14,403**	6,303	8,076	*(56)*
Treponema pallidum (All stages)	**3,948**	549	3,376	*(85)*
P&S	**894**	23	870	*(97)*
Early Latent	**1,104**	99	1,002	*(91)*
Latent (late, unknown duration)	**1,938**	427	1,504	*(78)*
Congenital	**12**	5	7	*(58)*
Chancroid	**0**	0	0	--
▸ Granuloma inguinale (GI)	**0**	0	0	--
▸ Lymphogranuloma venereum (LGV)	**37**	0	37	*(100)*
▸ Neonatal herpes (nHSV)	**15**	10	5	*(67)*
HIV (w/ and w/o AIDS, 2010)*	**3,498**	856	2,718	*(78)*

▸ Locally, but not nationally notifiable
* Annualized based on data through 6/30/2011. Estimated 111,949 persons living with HIV/AIDS in NYC as of 06/30/2011

Bureau of STD Control
Key components/functions

- Surveillance and epidemiology
- Clinical service delivery
- Partner services
- Community Outreach

Surveillance and epidemiology unit

- Enter, tabulate and analyze reports of STD and examine trends
- Conduct special studies

Clinical service delivery

- Bureau runs 9 STD clinics throughout NYC
  - ~115,000 patient visits per year
  - ~80,000 HIV tests per year
- Accessibility of clinics
  - Free, confidential
  - Patients seen without regard for immigration status/insurance
  - Children >12 entitled to care without parental consent
  - Bilingual staff (Spanish, English)
  - Language line for all other languages
  - Expanded hours (Saturday clinic) in each Boro

Partner services/management

- Partner elicitation: Process of eliciting names and locating information for persons who may have been sexually exposed to STD
- Partner notification: Seeking persons sexually exposed to STD, informing them of exposure, providing testing and treatment
- Partner management done for:
  - Infectious syphilis, lymphogranuloma venereum reported in NYC
  - HIV diagnosed in Bureau clinics, or upon request
  - Select cases of gonorrhea (w/ evidence of decreased susceptibility to cephalosporins)
  - NOT done for chlamydia
- Interview, re-interview

Community outreach

- CBO Unit
  - Linkage agreements with CBO's
  - Contact: Millicent Freeman
- Infertility Prevention Program (chlamydia and gonorrhea screening in family planning, juvenile detention)
- Prevention Training Center – provider training
- School screening program
  - Contact: Meighan Rogers

Transmission

- What determines the sustainability of transmission/shape of an epidemic?
- Basic reproductive number (R_0)
  - Average number of secondary cases generated by one primary case in a population of sexually active persons

$R_0 = 1$	No net increase in infection
$R_0 < 1$	Decline in infections
$R_0 > 1$	Increase in infections

Transmission

- Basic reproductive rate (R_0)

$R_0 = ßcD$

ß Probability of transmission per contact with sex partner

c Rate of sex partner change

D Duration of infectiousness

Transmission

- **Basic reproductive rate (R_0)**

$R_0 = ßcD$

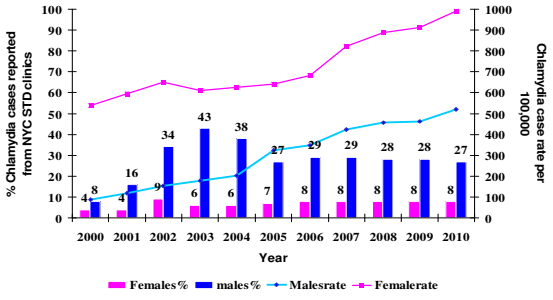
ß **Probability of transmission per contact with sex partner**
[Ectopy, mucus barrier, lack of correct condom use]

c **Rate of sex partner change**
[multiple, serial partners]

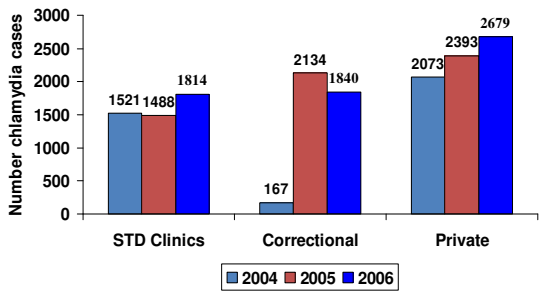
D **Duration of infectiousness**
[prolonged if poor symptom recognition, poor access to care, not screened at routine visits]

Chlamydia trachomatis

Case rate (per 100,000 population) of *Chlamydia trachomatis* reported to the New York City DOHMH, with percent reported from Bureau of STD clinics, 2000-2010, by sex

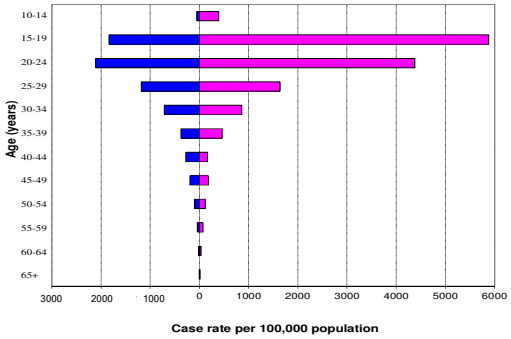


Male Chlamydia Cases Reported to NYC DOHMH, by provider type: Jan – June for Years 2004-2006



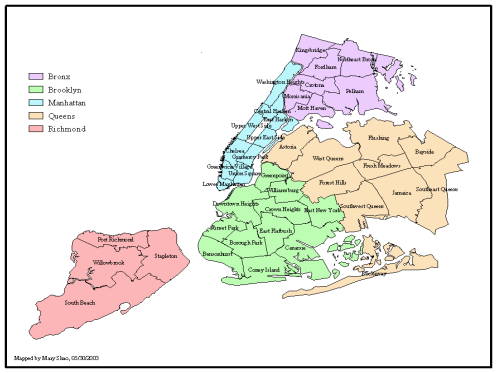
Pathela P, Hennessy RR, Blank S, Parvez F, Franklin W, Schillinger JA. The contribution of a urine-based jail screening program to citywide male Chlamydia and gonorrhea case rates in New York City. Sex Transm Dis. 2009 Feb;36(2 Suppl):S58-61.

Chlamydia reported to the NYC DOHMH. Case rates (per 100,000 population) by age and sex*, full year 2011

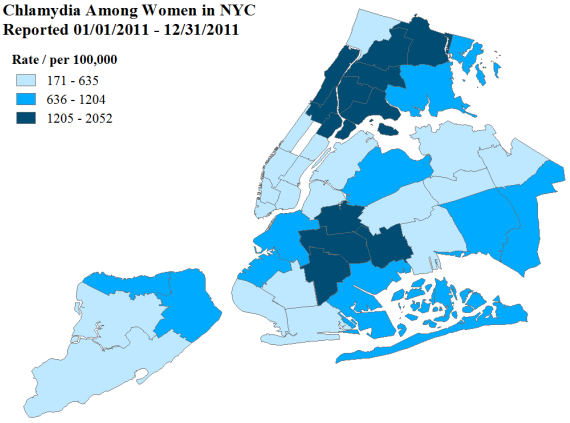


*excludes persons for whom sex or age were not reported

New York City Neighborhoods



Chlamydia Among Women in NYC
Reported 01/01/2011 - 12/31/2011



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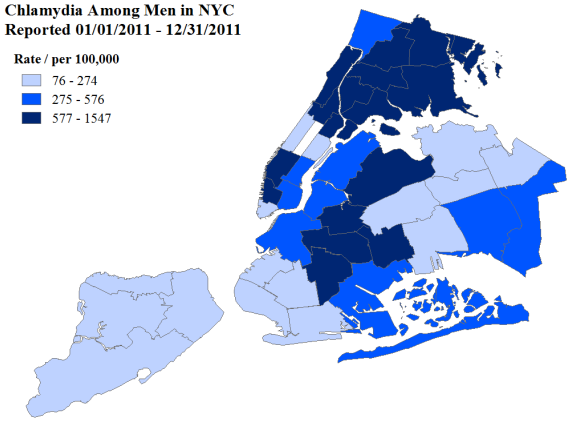


Repeat Ct infection in NYC, 2009

- >53,000 persons reported w/ Ct in 2009
- Repeat infection: Ct infection >30 days and <12 months after initial infection
  - 14.2% people had repeat infection
    - 16.1% of women (5,818/36,094)
    - 10.3% of men (1,791/17,377)

Data from live maven download, 08/24/11, ejk

% of women w/ repeat Ct Infection by age, NYC, 2009

Age at initial dx (in years)	% w/ repeat infection
Overall	16.1%
<15	25.6%
15 to 19	23.6%
20 to 24	14.6%
25 to 29	10.6%

- Mean no. repeat infections was 2.2 (male 2.1, female 2.2)
- Mean time to reinfx – 5.6 months (male 5.7, female 5.5)

Need to improved CT partner management (increase rates of sex partner tx)

- High rates of repeat *Chlamydia trachomatis (Ct)* infection 4-6 mos after tx
- Repeat *Ct* infection ↑ risk for sequelae
  - pelvic inflammatory disease, chronic pelvic pain, ectopic pregnancy, infertility
- Many female re-infections attributable to resuming sex with an untx d sex partner
- Low tx rates for male partners to Ct
- →Need for innovation and improvement in partner management

What is Expedited Partner Therapy (EPT)?

- A partner management strategy to tx sex partners of patients diagnosed w/ Ct
- Clinician provides medication or prescription to patient, who brings it to his/her partner(s)
- Partner tx given without the health care provider first examining the sex partner

What are the benefits of EPT?

- Compared to patient (self) referral, EPT:
  - Decreases re-infection in index patient
  - Increases proportion sex partners tx'd
  - Gets tx to sex partners unlikely to seek care

What is the legal status of EPT in NYS?

EPT legal in NYS for Chlamydia

- Law passed January 2009
- Regulations adopted October 2010
- Provider guidelines finalized March 2011

Summary of EPT law

- Permissible for Chlamydia (Ct) only
- Ct may be lab-confirmed *or* presumptive/clinical dx
- HCP may dispense medication, or prescription
- HCP protected from liability
- Regulations specify how to practice EPT
- EPT law expires 2014

EPT regulations *Summary*

- Do *not* use EPT if index co-infected w/ GC or syphilis
- Requires EPT informational materials be provided for patient to give partner
  - HCP must counsel patient to tell partner that it is important to read said materials before taking medication
  - Specifies content of informational materials
- Specifies prescription format
- Specifies Ct reporting requirements

EPT regulations *Informational materials*

Materials shall:

(1) Encourage partner to consult HCP for full eval as preferred alternative to EPT & regardless of whether take med
(2) Disclose risk of potential adverse drug reactions/ interactions
(3) Inform partner possible co-morbidity - could go untx'd
(4) Inform partners - seek care if sx of more serious infection
(5) Recommend partner who could be pregnant consult HCP asap
(6) Instruct patient and partner to abstain >= 7 days after each tx'd to avoid reinfection
(7) Inform partner at high risk for HIV to consult HCP for full eval and HIV/STD testing
(8) Inform patient and partner how to avoid repeat Ct

NYC DOHMH has developed informational materials which contain the required information. Available for download at the NYC DOHM EPT website: www.nyc.gov/health/ept

EPT regulations
Prescription format

(1) Designation "EPT" must be written in body of script

(2) Name, address, DOB of sex partner should be written in designated section *if available*

(3) If name, address, DOB of sex partner not available, the written designation "EPT" *shall be sufficient* for a pharmacist to fill the prescription

EPT regulations
Reporting requirements

(1) EPT law and regulations do not affect obligation to report Ct to local DOH (requirement remains)

(2) Reports of cases of Ct provided with EPT shall include the designation "EPT" plus the no. of sex partners for whom a prescription or medication provided

FOR ALL STD REPORTS

As of the date of this report,

- Were any of this patient's sex partners notified of possible exposure to a sexually transmitted disease?
  - ○ Yes, our office notified the partner(s)
  - ○ Yes, the patient was asked to notify partner(s)
  - ○ No ○ Unknown
- Did you provide treatment for any of this patient's sex partners?
  - ○ Yes, I gave extra medication/prescription for the sex partner(s)
    If yes, for how many sex partners was medication/ prescription provided? _____
  - ○ Yes, I saw the sex partner(s) in my office
  - ○ No ○ Unknown
- For all sexually transmitted diseases, indicate sexual partners in past year *(Check only one)*
  - ○ Males only ○ Females only
  - ○ Males and Females ○ Unknown

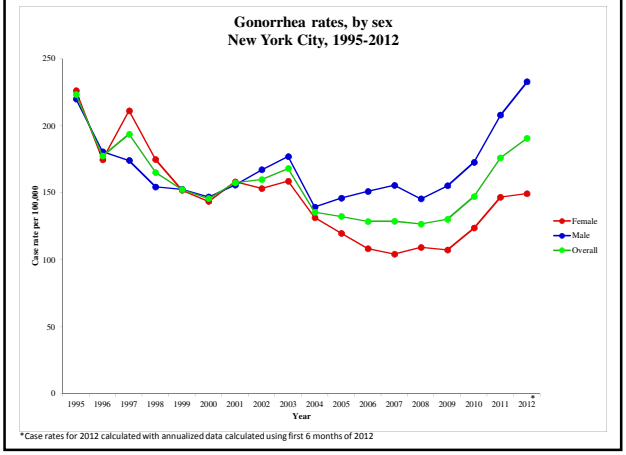
Resources

NYC DOHMH EPT Webpage: www.nyc.gov/health/ept

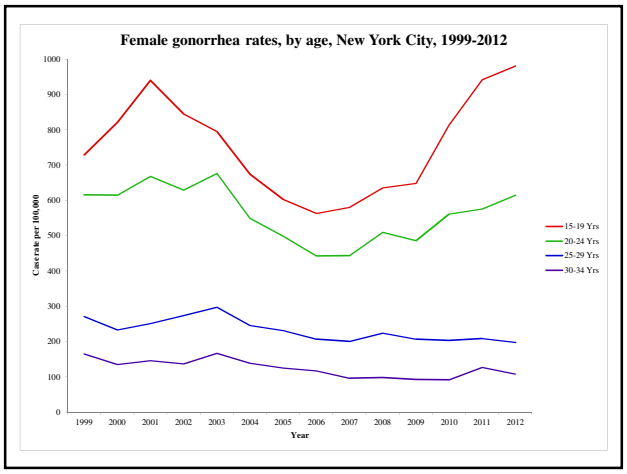
Key materials available:
- → **Law**
- → **Regulations**
- → **Dear colleague letter from Commissioners of Health**
- → **Provider guidelines**
- → **Pharmacist FAQ**
- → **Patient information**
- → **Partner information**
- → **EPT brochure for HCP**

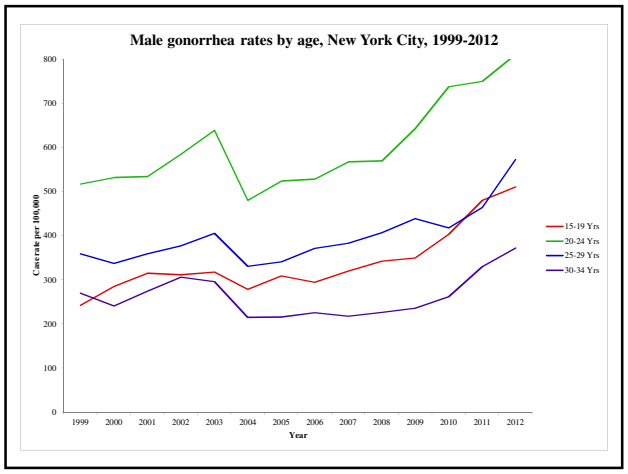
→ **Links to other sites, including CDC, White paper**

Neisseria gonorrhoeae



*Case rates for 2012 calculated with annualized data calculated using first 6 months of 2012


Female gonorrhea rates, by age, New York City, 1999-2012
Case rate per 100,000
Year
15-19 Yrs
20-24 Yrs
25-29 Yrs
30-34 Yrs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Case rate per 100,000
Year
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20-24 Yrs
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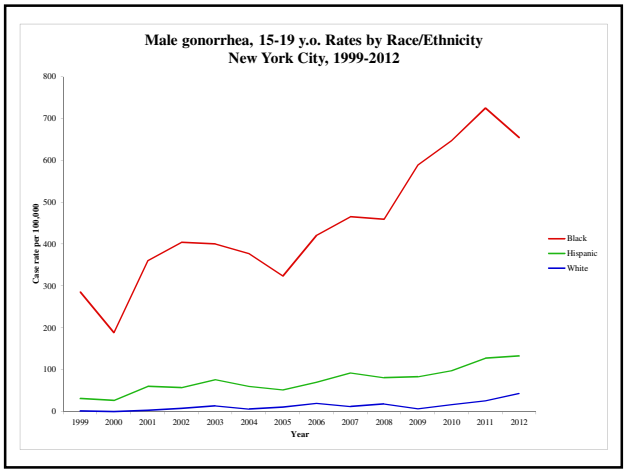
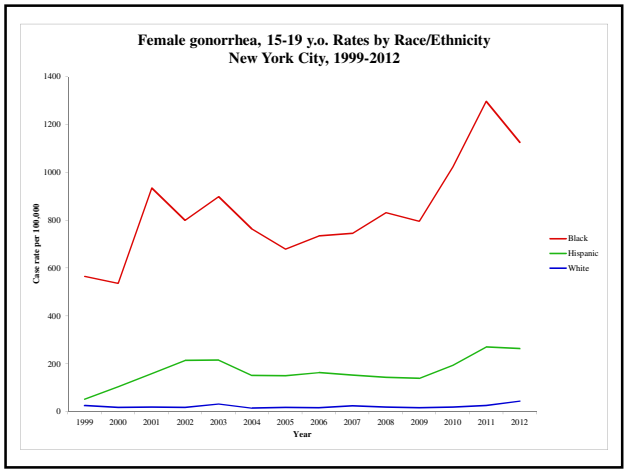

Male gonorrhea, 15-19 y.o. Rates by Race/Ethnicity
New York City, 1999-2012
Case rate per 100,000
Year
Black
Hispanic
White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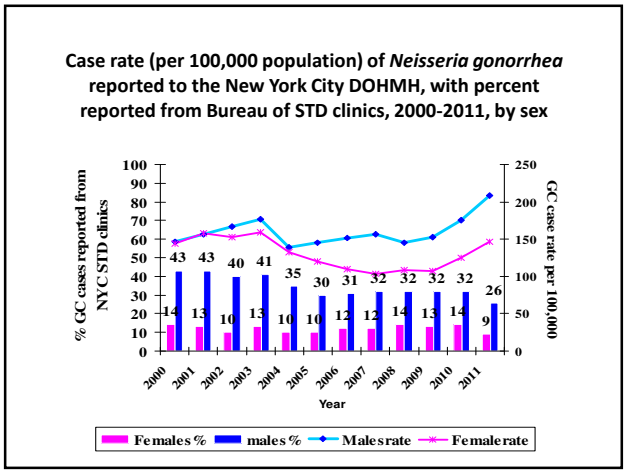
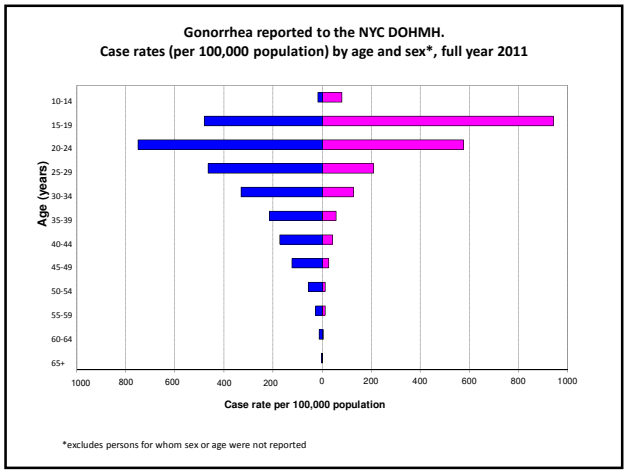
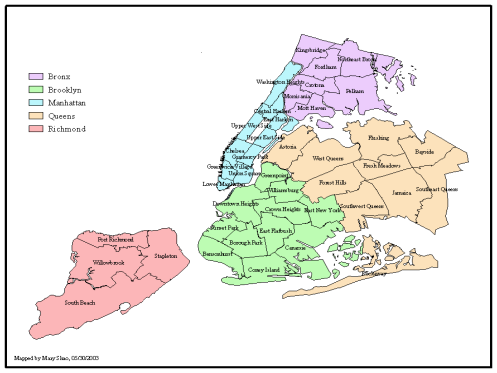
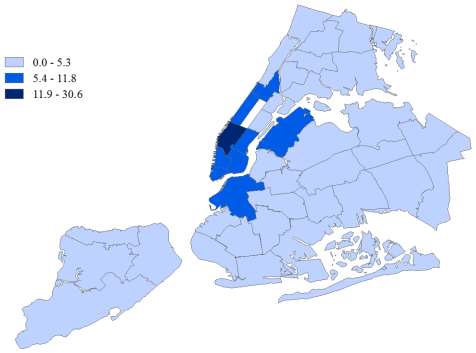

Case rate (per 100,000 population) of Neisseria gonorrhea reported to the New York City DOHMH, with percent reported from Bureau of STD clinics, 2000-2011, by sex
% GC cases reported from NYC STD clinics
GC case rate per 100,000
Year
43 43 40 41 35 30 31 32 32 32 32 26
14 13 10 13 10 10 12 12 14 13 14 9
Females %
males %
Males rate
Female rate


Gonorrhea reported to the NYC DOHMH.
Case rates (per 100,000 population) by age and sex*, full year 2011
Age (years)
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65+
Case rate per 100,000 population
*excludes persons for whom sex or age were not reported

New York City Neighborhoods

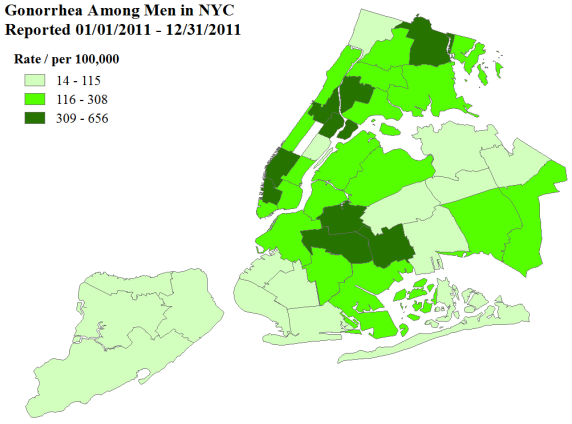


Prevalence of MSM by NYC neighborhood, 2005-2008



*Data from 2005-2008 Community Health Surveys, Bureau of Epidemiology Services

Gonorrhea Among Men in NYC
Reported 01/01/2011 - 12/31/2011



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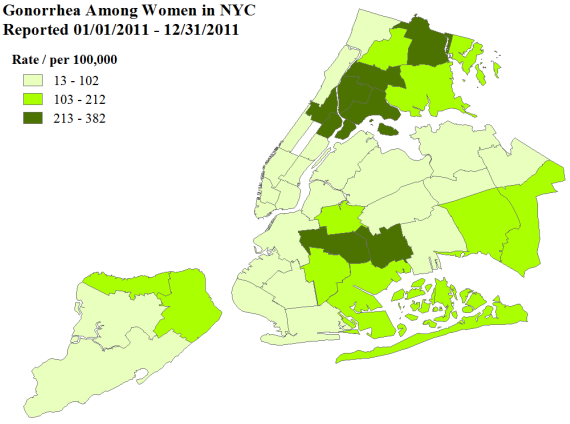


Emergence of cephalosporin resistance among Neisseria gonorrhoeae (GC)

Minimum inhibitory concentration

- **Minimum inhibitory concentration** (MIC): lowest concentration of an antimicrobial that will inhibit the growth of microorganism after overnight incubation.
- A lower MIC indicates that an organism is susceptible to an antibiotic, a higher MIC indicates that the antibiotic might not successfully treat an infection

Emergence of cephalosporin resistance among Neisseria gonorrhoeae (GC)

- *Neisseria gonorrhoeae* (GC) - resistance to multiple classes of antibiotics
  - Penicillin, Tetracyclines
  - Fluoroquinolones in mid-2000's
  - Azithromycin resistance emerging
  - Cephalosporins – only drug class recc'd for GC treatment
- Cephalosporin tx failures reported from Asia, Europe, now Canada
  - Gradual increases in minimum inhibitory concentrations (MIC) 'creep' observed in the US (seen both nationally and locally)
  - MSM isolates disproportionately represented among GC w/ elevated MIC
- MIC of cephalosporins which correspond to resistance have not been established (only "susceptible" and "decreased susceptibility")
- Nucleic acid amplification tests (NAAT) supplanting culture; current NAAT do not provide information on antibiotic resistance

Clinical Laboratory Standards Institute (CLSI)* breakpoints for MIC, *Neisseria gonorrhoeae*

Antibiotic	MIC value interpretive standard (ug/mL)		
	S	I	R
Ceftriaxone	≤0.250	--	--
Cefixime	≤0.250	--	--

Susceptible | Decreased susceptibility

*CDC uses Ceftiaxone (≥0.125 ug/ml) and Cefixime (≥0.250 ug/ml) as thresholds for decreased susceptibility

MIC creep in the US, 2006-2011*

- The % GC isolates with elevated MIC of cefixime is increasing:
  - Nationally: 0.1% → 1.5%
  - Among MSM nationally: 0.2%→3.8%
  - Western US: 0.2% → 3.2% (MSM, 0.1→4.5)
  - Northeastern and South: 0.1%→0.3% (MSM, 0.6%→1.5%)
- Elevated MIC of ceftriaxone less common
  - Nationally: 0.0% → 0.4%
  - Among MSM nationally: 0.0%→1.0%

*Data from the CDC Gonococcal Isolate Surveillance Project

CDC guidelines issued August, 2012*

CDC recommended treatment for uncomplicated urogenital, anorectal, and pharyngeal GC:

Ceftriaxone **250** mg IM

AND

Azithromycin 1 gram orally

As *combination* therapy for GC

*Morbidity and Mortality Weekly Report. August 10, 2012. 61(31); 590-594

CDC guidelines issued August, 2012

- Combination therapy for GC
  - Use even if CT NAAT is negative
  - No clinical data available to support dosing >250 mg Ceftriaxone
  - May substitute doxycycline 100 mg po BID X 7 days for Azithromycin 1 gram
  - Azithromycin preferred to Doxy: compliance advantages of single dose, and high prevalence of tetracycline resistance among GC

Cefixime (at any dose) *no longer recommended* for treating GC

- If cefixime must be used:
  - Give as combination therapy (Cefixime **400** mg + azithromycin or doxy)
  - Obtain culture w/ AST (which includes cefixime) before treating, or
  - perform a test-of-cure at 1 week
- If cephalosporins cannot be used, tx w/ Azithromycin 2 grams
  - Obtain culture w/ AST (which includes azithromycin) before treating, or
  - perform a test-of-cure at 1 week
- IMPORTANT:
  - If culturing before treating, make sure that culture AST includes the drug used to tx
  - GC NAATS can be used for 1 week test of cure

Watch for treatment failures!

- Treatment failure:
  - Persistent symptoms after treatment (with no interval sexual exposure), or
  - Positive GC NAAT or culture at 1 week test of cure visit (with no interval sexual exposure)
- Report possible treatment failures to NYC DOHMH
  - Julie Schillinger at jschilli@health.nyc.gov or (347) 396-7296

Managing a patient with possible treatment failure

- Treatment failure after recommended GC tx regimen:
  - Obtain culture w/ AST* from appropriate sites
  - Consult Infectious Disease expert, STD/HIV Prevention Training Center (http://www.nnptc.org) or CDC (404-639-8659) for treatment advice
  - Notify DOHMH (Julie Schillinger)
  - Test of cure 1 week after retreatment
  - Ensure sex partners from 60 days before infection are evaluated promptly and treated as indicated

*For culture to be useful for guiding tx, AST testing must include drugs used to tx

Managing a patient with possible treatment failure

- Treatment failure after alternative GC tx regimen:
  - Obtain culture w/ AST* from appropriate sites
  - Treat with Ceftriaxone 250 mg + Azithromycin **2** grams
  - Consult Infectious Disease expert
  - Notify DOHMH (Julie Schillinger)
  - Test of cure 1 week after retreatment
  - Ensure sex partners from 60 days before infection are evaluated promptly and treated as indicated

(If allergies preclude use of regimen above, consult with ID expert before treating)

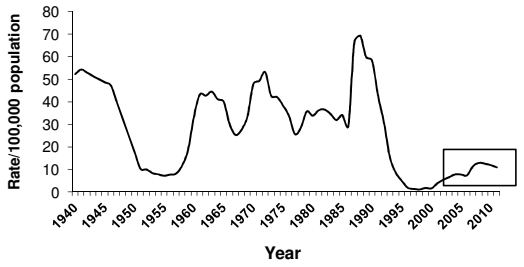
*For culture to be useful for guiding tx, AST testing must include drugs used to tx

Laboratory issues of concern to providers

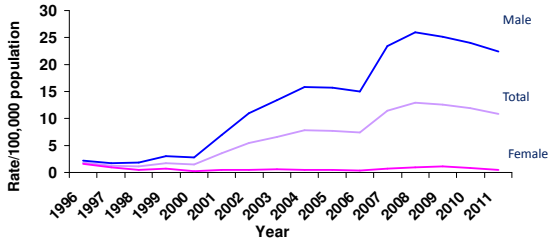
- NAAT purporting to identify genetic determinants of resistance not validated
- Not all labs do AST, and those that do, may not include key antibiotics of interest in their panel
- AST testing should be done with disk diffusion method (provides results in ug/ml, that translate directly to MICs)
- Isolates with elevated MICs of cephalosporins may not be resulted as "resistant" because no CLSI standards for thresholds
- Labs should hold specimens with unusual results, but may fail to do so
- Labs should send isolates with reduced susceptibility to cephalosporins to NYC DOHMH Public Health Lab, but may fail to do so

Syphilis

Reported Primary and Secondary (P&S) Syphilis
New York City, 1940-2011



Case rate (per 100,000 population) of Primary and Secondary Syphilis reported to the New York City DOHMH, 1999-2011, by sex



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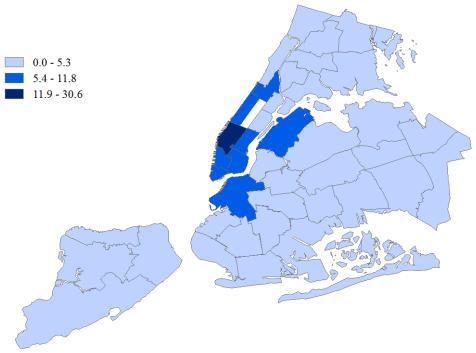
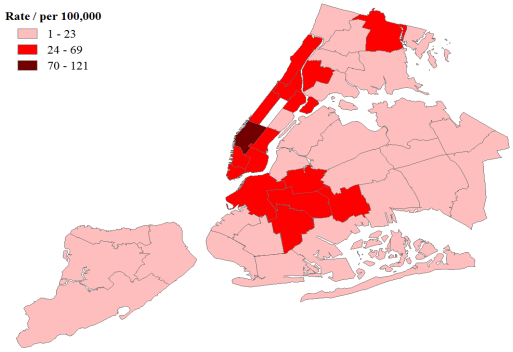
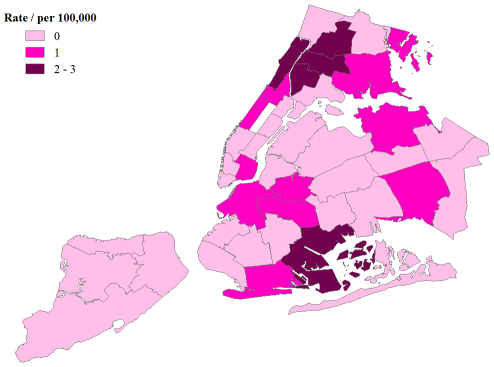


*Data from 2005-2008 Community Health Surveys, Bureau of Epidemiology Services

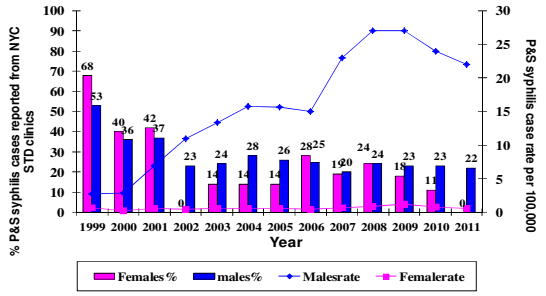
Male Primary & Secondary Syphilis
Case rates per 100,000 males, NYC DOHMH, 2011



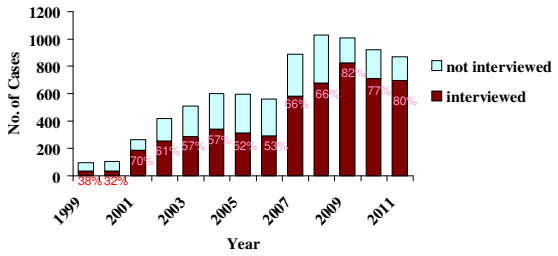
Female Primary & Secondary Syphilis,
Case rates per 100,000 females, NYC DOHMH 2011



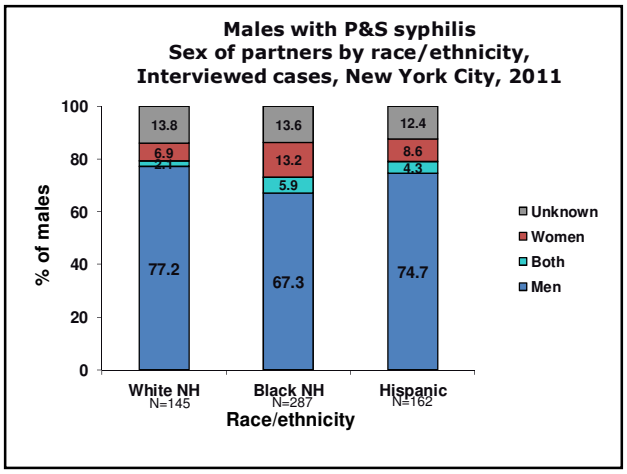
Case rate (per 100,000 population) of Primary and Secondary Syphilis reported to the New York City DOHMH, with percent reported from Bureau of STD clinics, 1999-2011, by sex

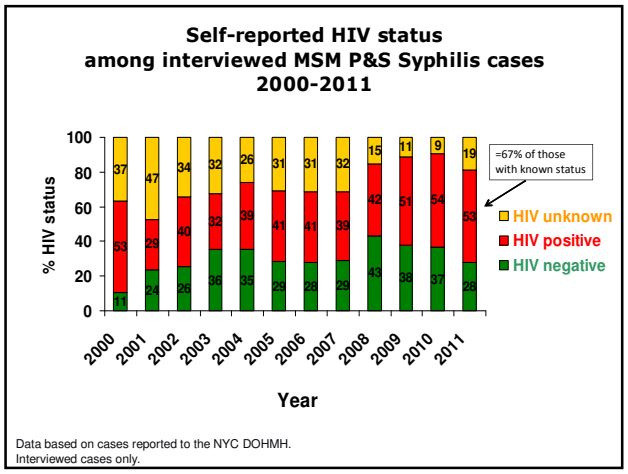


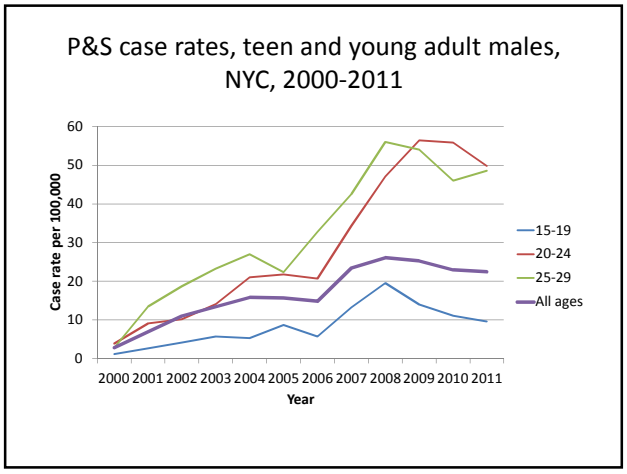
Male P&S syphilis
1999-2011, New York City
Case numbers, by interview status

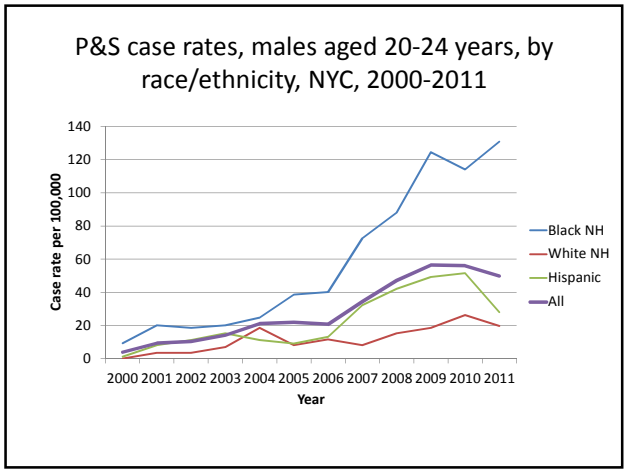


Data based on cases reported to the NYC DOHMH









Where do male P&S syphilis cases meet sex partners?*

Venue	n/N (%)
Internet only	58/177 (33)
'Other' only	20/177 (11)
Bars only	14/177 (8)
Clubs only	9/177 (5)
Street only	8/177 (5)
Internet + any other venue	86/177 (49)

*425/562 (76%) P&S cases interviewed; 177 (42%) reported ≥ venue. Jan-Aug, 2011

EpiQuery for STD

- NYC STD surveillance data, 2000-2009 now available on line at:

https://a816-healthpsi.nyc.gov/epiquery/EpiQuery/