Beyond Race/ethnicity: Positivity of *Chlamydia Trachomatis* among women attending Region X family planning clinics in the U.S., 1997-2005, by individual risks and area-based socioeconomic measures

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Background:
Region X Chlamydia Project

- Starting 1988, widespread screening and treatment for chlamydia in Alaska, Idaho, Oregon and Washington (U.S. Public Health Service Region X)
- All sexually active women age <25 y screened at 150 family planning clinics (~50,000 per year)
- Implemented the first chlamydia prevalence monitoring surveillance system using standardized testing and data collection
- Became the basis for the National Infertility Prevention Program (IPP)

Objectives

- Assess race/ethnic differences in chlamydia positivity and trends, 1997 - 2005
- Assess trends in risks associated with chlamydia positivity in women aged 15-24 years seen in family planning clinics
- Explore area-based socioeconomic measures (ABSM) in conjunction with individual-level risk factors in predicting chlamydia positivity

Methods

Study population

- All women 15-24 years screened for chlamydia 1997 – 2005
- 129 family planning clinics included, based on:
  - Participating in the project all 9 years
  - Screening at least 50 women per year
- Clinic volume averaged 4,742 tests (range: 534; 19,043)
- 611,732 chlamydia test records

Methods: Characterizing Clients

Measures

- The same data form was used by all clinics to collect individual-level measures
  - Demographics—age, race, ethnicity
  - Reason for clinic visit, exposed to chlamydia
  - Self-reported sexual risk behavior history, past 60 days—new sex partner (SP), multiple SPs, symptomatic SP
  - Other risk history items—condom use last sex, CT infection in past year
  - Clinical findings—MPC, friable cervix, ectopy and PID
  - Chlamydia test type

Methods: ABSM

- Area-based socioeconomic measures
- ABSM were generated from U.S. Census 2000 Summary Files 1 and 3; HRSA/Rural Health Research Ctr.
- Geo-coded to ZIP code tabulation areas (ZCTA's)
  - Population density (RUCA)
  - Median household income
  - Percent racial minority
  - Percent Hispanic ethnicity
  - Education, % population age 25 or older with < HS diploma
  - Poverty, % population < 100% FPL
- ABSM categorized
- ABSM merged with individual CT test records via patient ZIP code

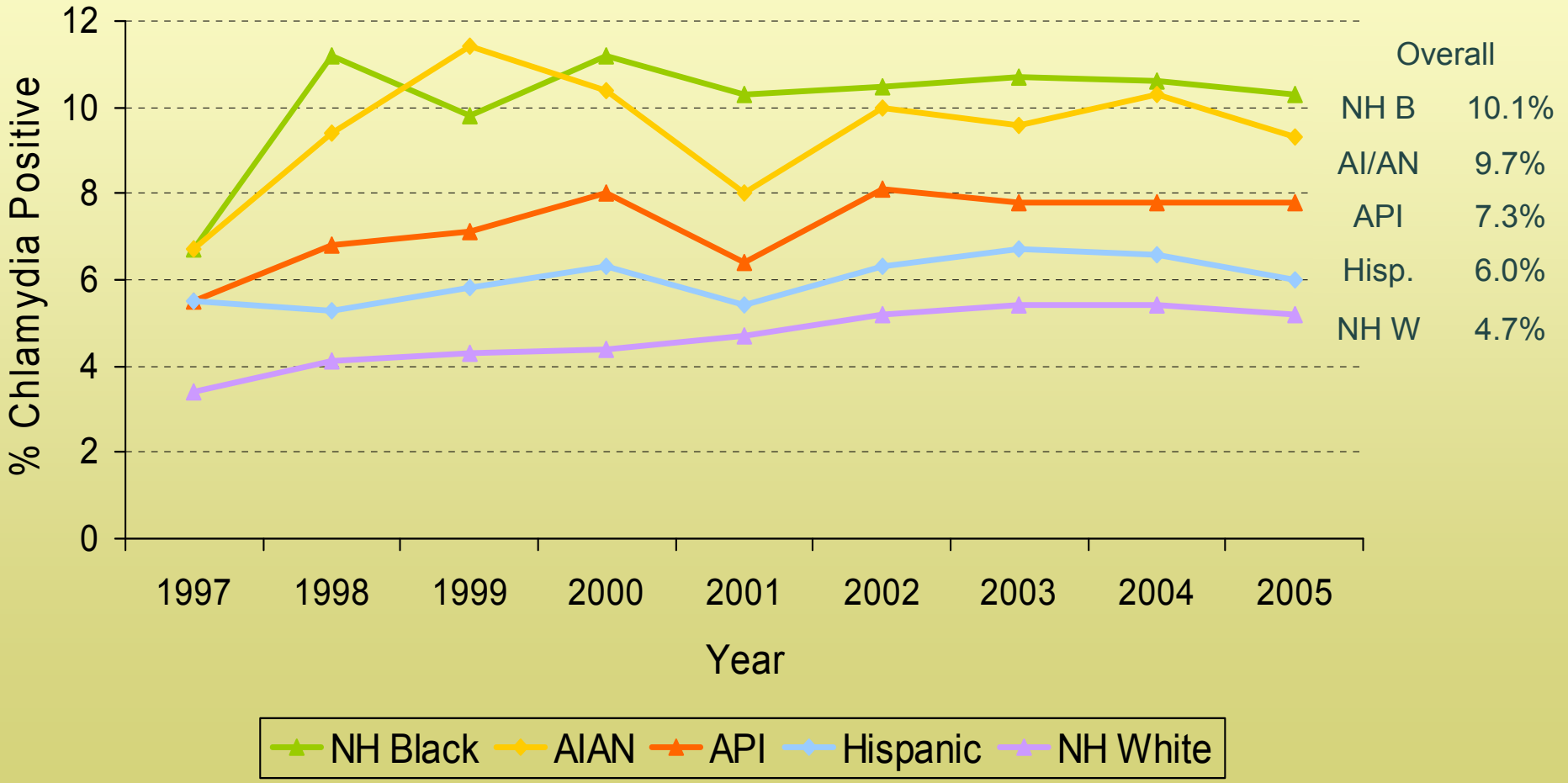
Methods: Analysis

Analysis

- Assessed trends over time in population characteristics and factors associated with chlamydia
- Calculated chlamydia positivity by demographics, behavioral risk history, clinical findings, and ABSM
- Generated models for overall sample and each race/ethnic group

Results

Chlamydia trends* in 15-24 year old women in family planning clinics: Region X, 1997-2005, by race and ethnicity



*Positivity unadjusted for test type

Individual-level risk factors and chlamydia

Characteristic	Percent	% CT+
Age		
15 - 17	21%	6.2%
18 - 19	26%	6.1%
20 - 24	54%	4.7%
Race/ethnicity		
NH White	77%	4.7%
NH Black	5%	10.1%
American Indian/AK Native	1%	9.7%
Asian or Pacific Islander	4%	7.3%
Hispanic	13%	6.0%
Reason for visit, sex partner w/ CT		
No	99%	5.0%
Yes	1%	26.6%

Individual-level risk factors and chlamydia, cont.

Characteristic	Percent	% CT+
Condom used, last sex		
No	75%	5.4%
Yes	25%	5.1%
Behavioral risks, one or more		
No	74%	4.2%
Yes	26%	8.6%
Clinical findings, one or more		
No	93%	4.5%
Yes	7%	13.8%
Chlamydia infection in prior year		
No	96%	5.0%
Yes	4%	12.2%
Test type, NAAT		
No	50%	4.1%
Yes	50%	6.5%

Aggregate-level risk factors and chlamydia

Characteristic	Percent	% CT+
Household median income		
<$30,000	5%	5.6%
$30,000 thru $34,999	19%	5.5%
$35,000 thru $39,999	23%	5.2%
$40,000 thru $44,999	20%	5.5%
$45,000 thru $49,999	9%	5.5%
$50,000 thru $59,999	17%	5.5%
$60,000+	7%	5.1%
% Below 100% federal poverty level		
< 10%	36%	5.3%
10% - 19%	54%	5.4%
≥ 20%	10%	5.5%
Household median income, quartiles*		
Highest 3 quartiles	88%	5.3%
Lowest quartile	12%	5.9%

*State-specific quartiles based on median incomes for **all** ZCTAs

Aggregate-level risk factors and chlamydia, cont.

Characteristic	Percent	% CT+
% Minority race		
< 20%	69%	4.7%
≥ 20%	31%	6.9%
% Hispanic ethnicity		
< 20%	92%	5.3%
≥ 20%	8%	6.6%
% Population age 25+ without HS diploma		
< 20%	80%	5.2%
≥ 20%	21%	6.2%
Population density		
Urban	78%	5.6%
Rural	22%	4.6%

Did the study population of women visiting family planning clinics change over time?

Changing Elements	1997	2005
Age, 20 – 24 years	51%	60%
Diagnosis by NAAT	12%	60%
Chlamydia positivity	4.0%	5.8%

Stable Elements, 1997 – 2005

Individual risk factors

- Race/ethnicity
- Visit reason, SP with chlamydia
- Sexual risk behaviors
- Clinical findings
- CT infection in prior year

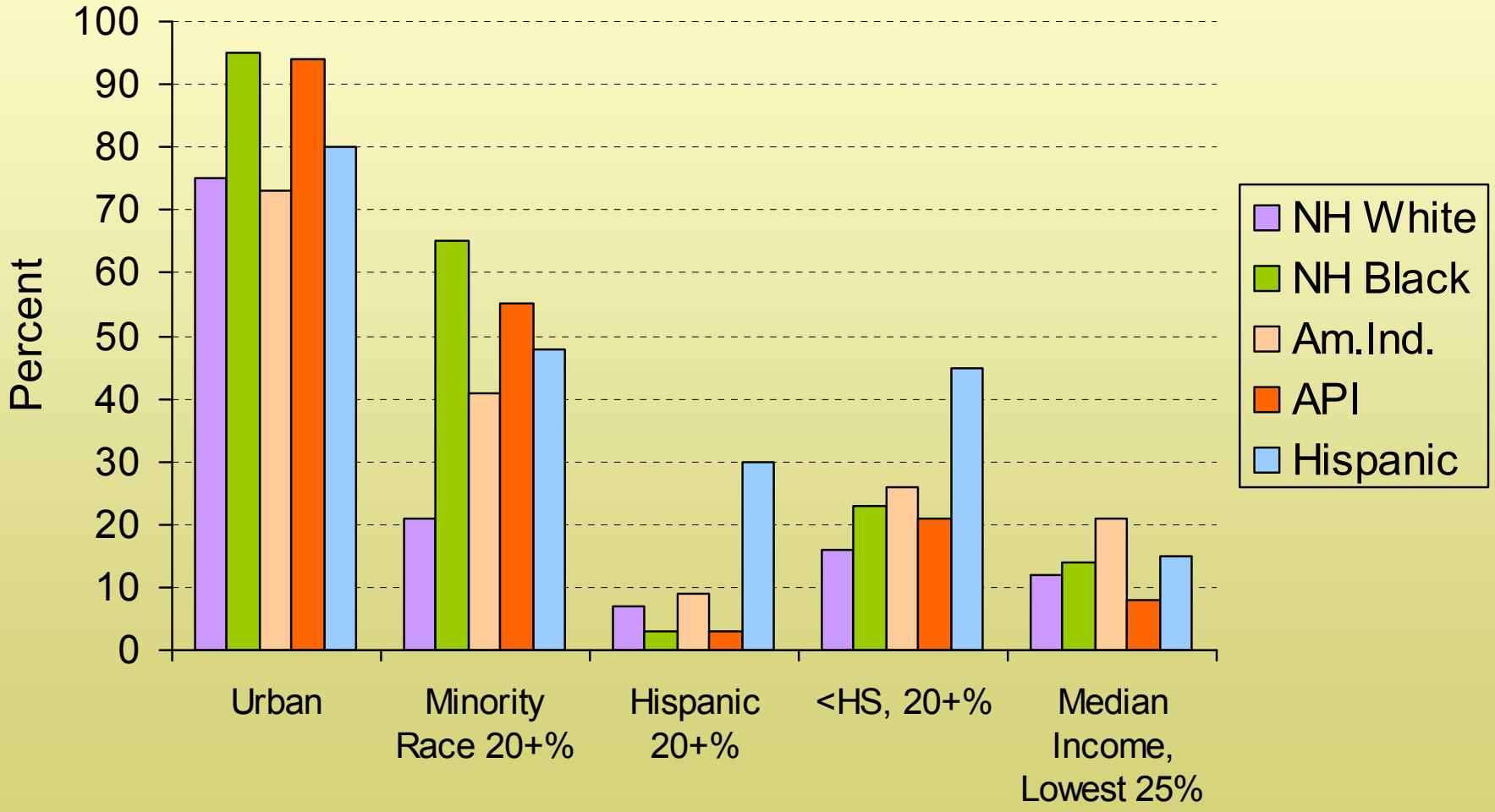
ABSM

- Population density
- Racial minority
- Hispanic ethnicity
- HS diploma
- Median household income

Race/ethnicity and individual-level factors

Measure	NH White	NH Black	AI/AN	API	Hispanic
Age, 15-19 y	48%	49%	54%	43%	36%
CT infection in prior year	4%	10%	8%	6%	4%
Sexual risk behaviors, 1+	27%	28%	34%	23%	16%
Clinical signs, 1+	6%	8%	8%	8%	9%
Diagnosis by NAAT	48%	66%	69%	72%	45%

Race/ethnicity and ABSM, 1997 - 2005



Multivariate results

Characteristic	Adj. OR	Characteristic	Adj. OR
Individual factors		**Individual factors, cont.**	
Age, 15 - 19 years	1.35	Clinical findings	3.10
Race/ethnicity		CT infection, prior year	1.66
NH White	Ref.	Diagnosis by NAAT	1.28
NH Black	1.82	Visit year	1.04
AI/AN	1.70		
API	1.35	**Aggregate factors**	
Hispanic	1.25	Population density, rural	0.90
SP w/ chlamydia	4.00	Racial minority, ≥ 20%	1.12
Sexual risk behaviors	1.92	Hispanic ethnicity, ≥ 20%	1.22
No condom, last sex	1.17	< HS diploma, ≥ 20%	1.05
		Median household income lowest quartile	1.05

Multivariate results—within race/ethnicity, selected findings

	Adj. OR				
Measure	NH White	NH Black	AI/AN	API	Hispanic
Sexual risk behaviors	1.93	1.37	1.80	1.97	2.25
CT infection in prior year	1.83	1.18	1.38	1.65	1.57
Visit year, since 1997	1.05	1.00	1.00	1.04	1.01
Population density, rural	0.90	0.76	0.81	0.92	0.93
Racial minority, ≥ 20%	1.11	1.37	1.29	1.10	1.05
Hispanic ethnic, ≥ 20%	1.06	1.17	1.39	1.13	1.37
< HS diploma, ≥ 20%	1.13	0.95	1.18	0.94	1.00
Median household income, lowest quartile	0.94	1.12	1.17	1.00	1.25

Limitations

- Test records, not annual summary of individuals' tests
- Data collected by many individuals in different ways across clinics over time
- ABSM
  - Debate over validity, meaning and applicability
  - Use of ZCTAs and ZIP codes
  - ZIP codes versus census tracts
  - Time and mobility
  - A priori categories, relative operationalizations

Conclusions

- Race/ethnicity
  - Chlamydia positivity was stable over time for race/ethnic minority groups, after adjusting for other risk factors
  - NH Whites showed a 5% annual increase
  - Race/ethnic-specific associations and models varied
- ABSM
  - Had modest, but significant effect on relationship between race/ethnicity and chlamydia positivity
  - Impact varied by race/ethnicity
  - Within race/ethnic group, racial composition of neighborhood affected risk of disease more than SES
  - Did not account for race/ethnic differences in predicted chlamydia positivity

Future issues

- Estimate clinic chlamydia testing coverage
  - Other analyses suggest no race/ethnic differences in coverage among women aged 15-24 years
- Revisit measures
  - Practical proxies for sexual network indicators
  - Expand time frame for risk behaviors
  - Individual sexual risk behavior items rather than summary score
- Identify clinics where patient-level aggregate records can be created from test-level data
  - Adjust for tests/client
  - Calculate re-infection
- Explore possible shift in clinic client population and service delivery
  - Assess impact of new visit types collected beginning 2003
  - Community access to clinic services

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