



Estimating Colorado's HIV At-Risk Population: Adapting National Methods at the State Level

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Disclosures

- No conflicts of interest to declare for today's presentation.





Background

- State level estimates of numbers of individuals at high risk for HIV are useful for public health planning
 - HIV testing initiatives
 - HIV prevention programs
 - Estimating the number of persons with PrEP indications
- Estimates form baseline for tracking progress
 - HIV incidence and prevalence rates
 - PrEP coverage





Methods: References Reviewed

- Oster, A. et.al.(2015).** Population Size Estimates for Men who Have Sex with Men and Persons who Inject Drugs. *Journal of Urban Health*, 92, 733-743.
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- Lieb, S. et.al. (2011).** Statewide estimation of Racial/Ethnic Populations of Men who have sex with Men in the US. *Public Health Reports*, 126, 60-72

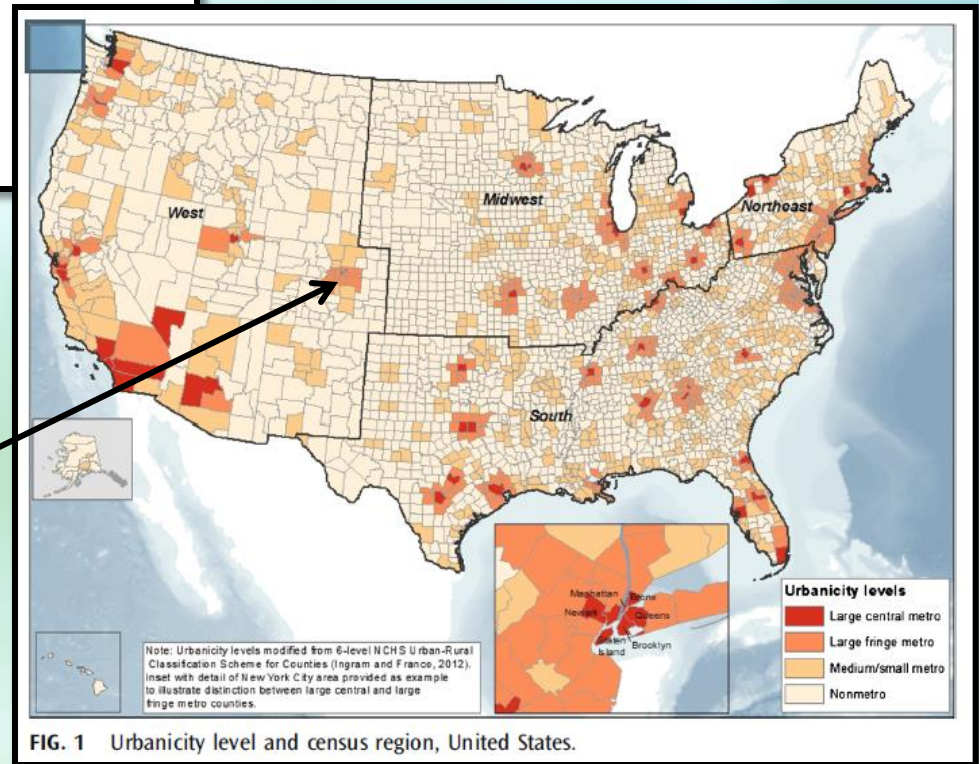
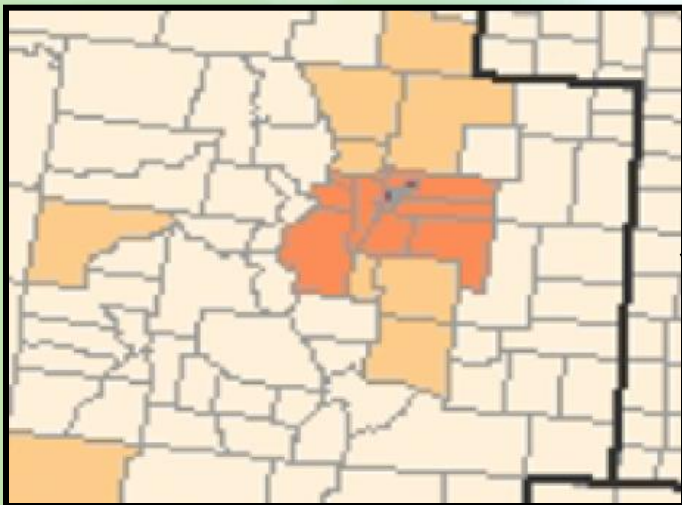


Methods: Estimates of State Level Populations for MSM and PWID

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Population Size Estimates for Men who Have Sex with Men and Persons who Inject Drugs

Alexandra M. Oster, Maya Sternberg, Amy Lansky, Dita Broz, Cyprian Wejnert, and Gabriela Paz-Bailey





Methods: Estimating State Level Populations for Heterosexuals

RESEARCH ARTICLE

Estimating the Number of Heterosexual Persons in the United States to Calculate National Rates of HIV Infection

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Estimates the number of heterosexuals in U.S. population by gender, age, and race.

Examines higher risk behaviors and estimates that 4.5% of heterosexuals are at high risk for HIV acquisition.



Published National Estimates

Risk Population	Overall Estimate	Age Group
MSM behavior in past 12 months*	2.5%	13 and older
MSM behavior in life-time*	4.7%	13 and older
Injected drugs in past 12 months *	0.3%	13 and older
Injected drugs in life-time *	2.3%	13 and older
Heterosexual behavior in life-time ^	86.7%	13 and older
Females only, heterosexual behavior in life-time ^	89.4%	13 and older
Males only, heterosexual behavior in life-time ^	84.1%	13 and older

*Oster, et.al, 2015 / ^Lansky, et.al. 2015



Estimated Number of HIV Negative or Undiagnosed HIV+ Persons, Colorado

Risk Group	Estimated Number in Risk Group (18-59)	HIV+ Persons with Risk Attributed to Behavior (as of Dec 31, 2015)	Estimated Number of HIV Negative or Undiagnosed
MSM behaviors in past 12 months*	39,762 (2.5% of male population)	9,371 (Includes MSM/IDU)	30,391
Injection drug use in past 12 months*	9,389 (0.3% of total population)	875 (Includes only IDU cases)	8,514
Heterosexual behavior / life-time^	2,679,038 (86.7% of total population w/o MSM)	2,605 (includes HIV+ cases with no identified risk)	2,676,433



Applying CO Estimates For PrEP Planning

Risk Group	Estimated number of HIV Negative or Undiagnosed	Proportion thought to be at high risk for HIV from <i>MMWR</i> *	Persons who might benefit from PrEP
MSM behaviors in past 12 months	30,391	24.7%	7,507
Injection drug use in past 12 months	8,514	18.5%	1,575
Heterosexual behavior / life-time	2,676,433	0.4%	10,705
Total			19,787

* Smith, DK (2015) Vital Signs: Estimated Percentages and Number of Adults with Indications for Preexposure Prophylaxis to Prevent HIV Acquisition – United States, *MMWR*, 64(49, 1291-1295)



High-risk Heterosexual Inclusion Criteria for PrEP Indication

Criteria 1

Man or woman aged 18–59 years

Not known to be HIV positive

Sex with two or more opposite sex partners in past 12 months

AND at least one of the following:

Criteria 2

Any reported condomless sex in the last 4 weeks *AND* sex with a PWID

For females, sex with a bisexual male sex partner in the past 12 months

Sex with partner reported to be HIV-positive



Fine Tuning: High-risk Heterosexual

Higher HIV prevalence among heterosexuals with lower socio-economic status

Socio-Economic Characteristic	HIV Prevalence among those with Characteristic	HIV Prevalence among those without the Characteristic
High School or Lower Education Attainment	2.8%	1.2%
Unemployed	2.6%	1.0%
Living below federal poverty limit	2.3%	1.0%

*MMWR/Vol. 60/No. 31/ August 12, 2011



Applying Alternative Methods of Estimating Heterosexuals with PrEP Indications

Source	Proportion thought to be at high risk for HIV, based on behavior	Heterosexuals who might benefit from PrEP based on behavior
MMWR*	0.4%	10,705
Denver NHBS Data ^	6.3%	55,164

*Smith, DK, et.al, 2015 / ^CDPHE Unpublished data, 2016



Limitations to Population Estimates

Estimates of risk behavior calculated from large population based surveys, conducted within 15 US counties per year, which may not fully represent behaviors in Colorado

Homeless and institutionalized (incarcerated) populations are not represented in the data used to calculate estimates

Age groups 18-59 were used to estimate behaviors among ages 13 and older, which may cause an underestimate among those 13-17 and those 60 and older

Indications for PrEP are based on behaviors reported in large population survey and do not consider the added benefits on HIV incidence resulting from Treatment as Prevention



Calculation Sample

Local Census Population * National At-risk Estimate (%) = **Local Number of Population At-risk**

Local At-risk Population Estimate * National PrEP Indicator (%) Estimate = **Local Number of At-risk Population With PrEP Indications**



Conclusions/Implications

- National estimates of populations at risk for HIV can be applied to state level census data to determine actual numbers of indicated individuals
- Estimating actual numbers of heterosexuals at risk for HIV is difficult and estimates can vary widely
- Sub-population estimates can be calculated to ensure a health equity approach to program initiatives such as PrEP and other bio-medical interventions



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