



Robert Stempel College  
of Public Health  
& Social Work

# Role of racial/ethnic neighborhood concentration and poverty on racial disparities in linkage to HIV care, Florida, 2014

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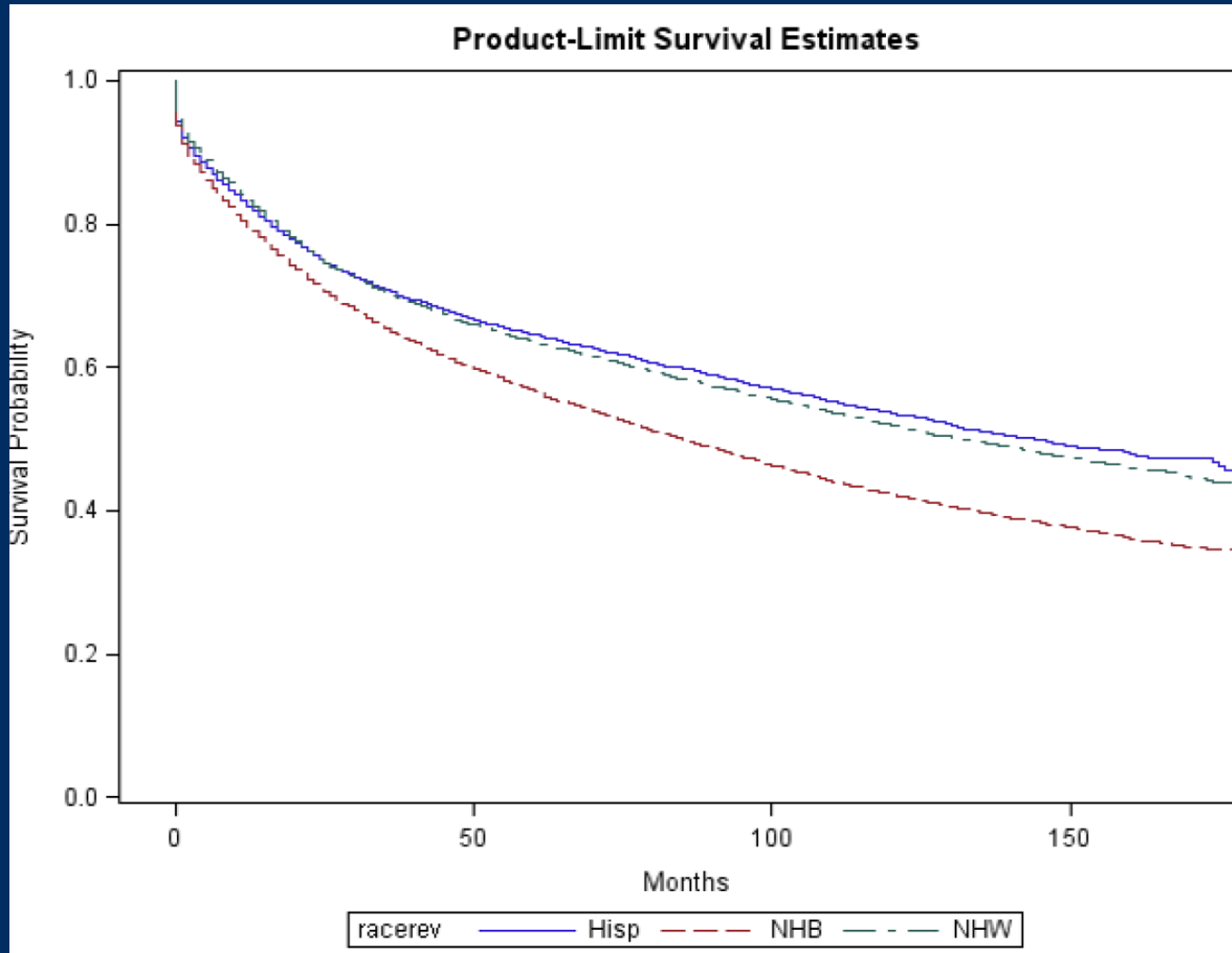
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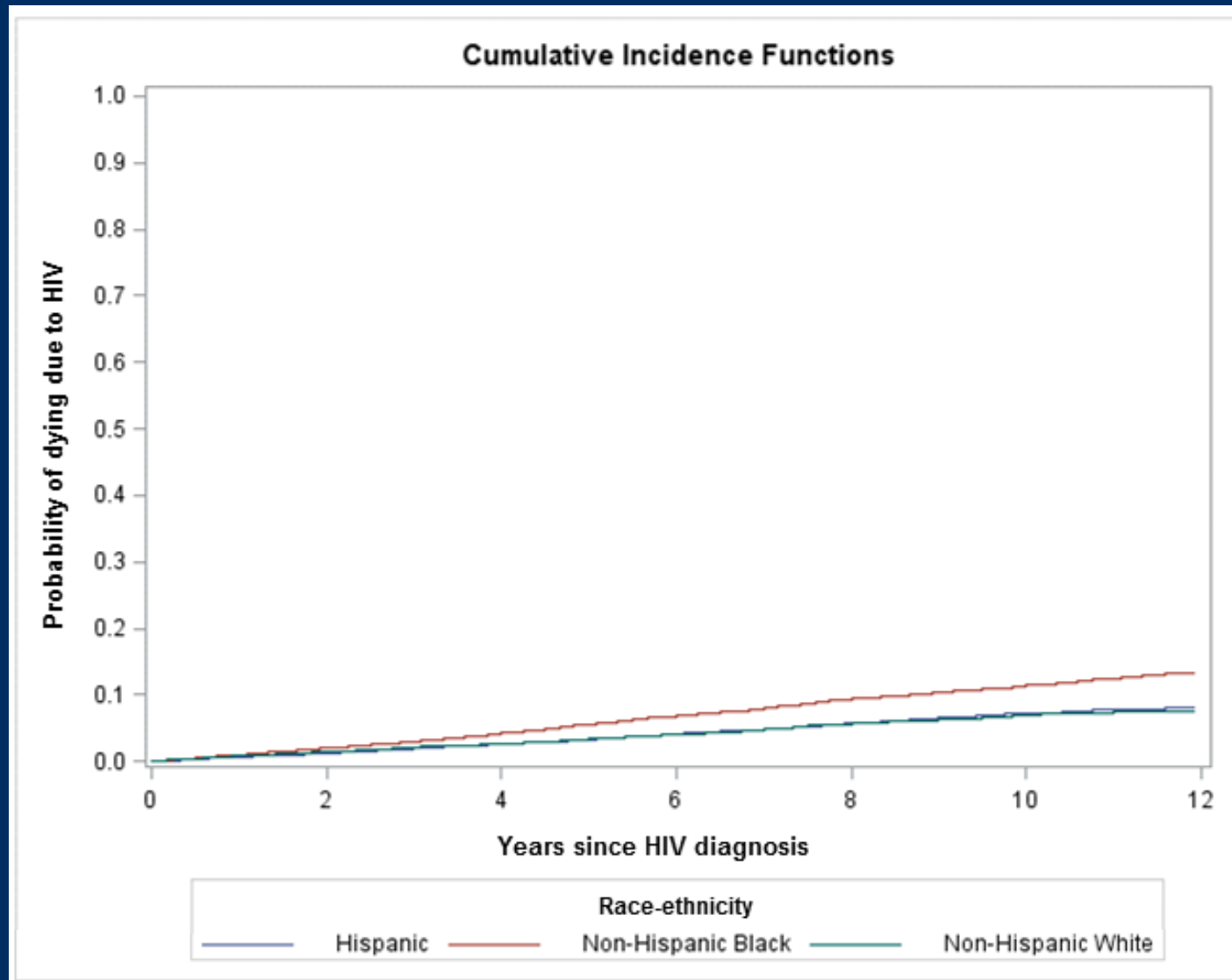
# Retrospective Cohort Study of Role of Poverty, Segregation, and Rural/Urban Residence on HIV Survival

- Motivation: racial disparities in survival among people with HIV in the US
- Collaborative study with HIV/AIDS Section, Florida Department of Health
- Enhanced HIV/AIDS Surveillance Reporting System (eHARS) de-identified data
- Linked data by ZIP code to area-level socioeconomic data from US Census and American Community Survey
- Funded by National Institute of Minority Health and Health Disparities, National Institutes of Health
- Multiple studies since 2009

# Racial disparities in survival: Kaplan-Meier Survival Curves for Floridians diagnosed with AIDS, 1993-2004



# Racial-ethnic differences in HIV mortality among people without concurrent AIDS, Florida, 2000–2011

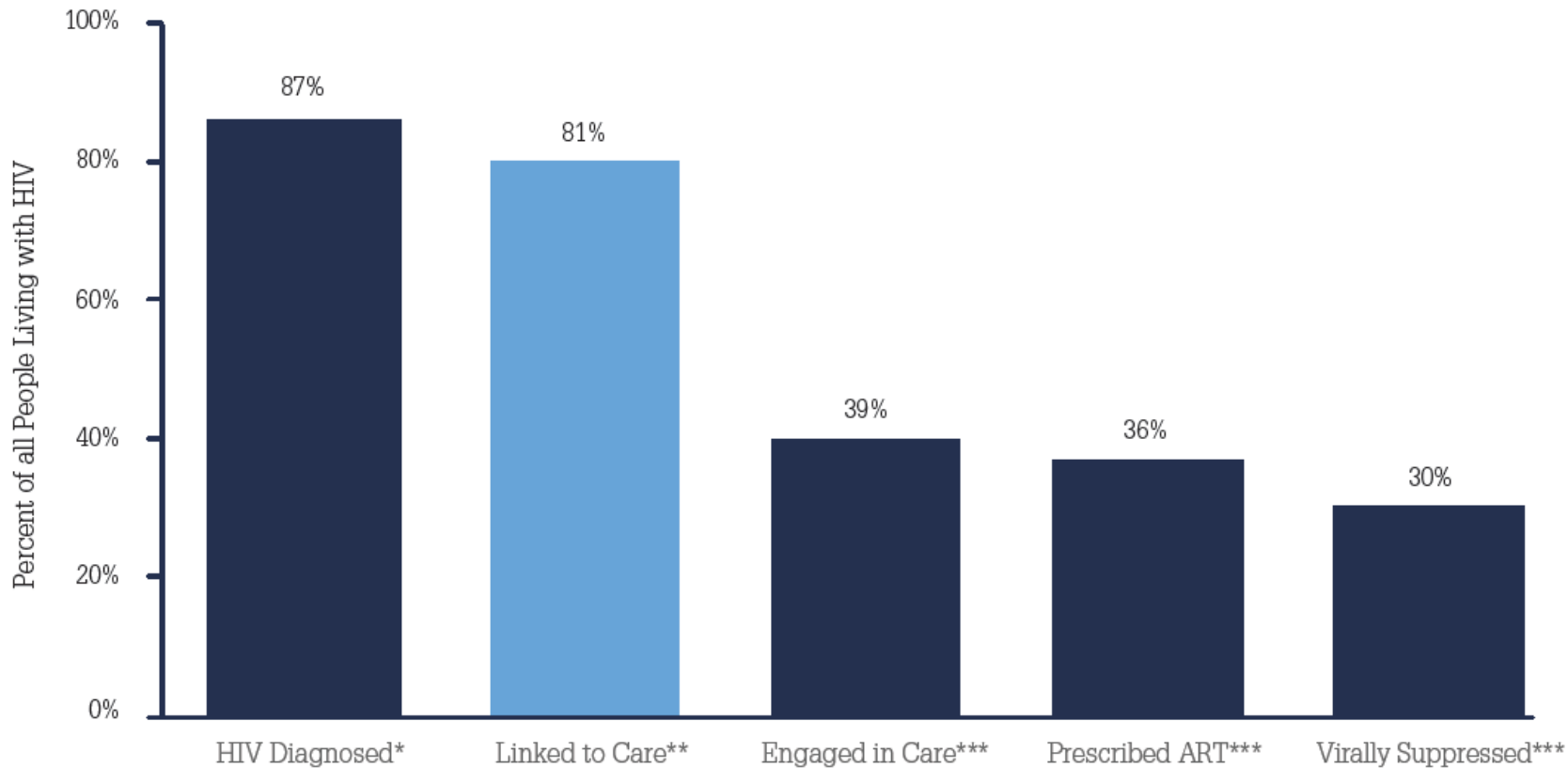


Source: Trepka et al,  
*Annals of Epidemiology*,  
2016;26(3):176-182.

# Risk of HIV death among Floridians diagnosed with HIV 2000-2009

- Competing risk proportional hazards analysis
- Adjusted for period of diagnosis, age group, sex, country of birth, HIV transmission mode, area level poverty and rural/urban status
- **Non-Hispanic Black: Non-Hispanic White** adjusted hazards ratio
  - Concurrent AIDS: **1.34** (95% CI 1.23-1.47)
  - No concurrent AIDS: **1.41** (95% CI 1.26-1.57)
- **Hispanic: Non-Hispanic White** adjusted hazards ratio
  - Concurrent AIDS: **1.18** (95% CI 1.05-1.32)
  - No concurrent AIDS: **1.18** (95% CI 1.03-1.36)

**FIGURE 3: The HIV care continuum among persons living with HIV infection in the United States 2012<sup>8</sup>**



\* Diagnosed is a calculated estimate based on data reported to the National HIV Surveillance System, the denominator is the estimated number of persons living with HIV (1.2 million).

\*\* Linkage to care is the percentage of persons linked to medical care within 3 months after diagnosis (numerator) among those newly diagnosed in 2012 (denominator). Data are from 28 jurisdictions with complete reporting of CD4 and viral load test results to CDC.

\*\*\* Engaged in care, prescribed ART and virally suppressed data (numerators) come from the Medical Monitoring Project and based on people who had at least one HIV care visit during January to April 2012. The denominator is the estimated number of persons living with HIV (1.2 million).

# Delayed HIV diagnosis, Florida 2007-2011

- Delayed diagnosis defined as diagnosed of AIDS within 3 months of HIV diagnosis
- Higher in rural than urban areas (35.8% vs. 27.4%)
- Calculated odds ratio for late HIV diagnosis controlling for year of HIV diagnosis, sex, age group, country of birth, mode of HIV transmission, area level socioeconomic status and number of doctors per 100 square miles
- In urban areas
  - Non-Hispanic Black: Non-Hispanic White odds ratio **1.17** (95% CI 1.08-1.27)
  - Hispanic: Non-Hispanic White odds ratio: **1.14** (95% CI 1.04-1.25)



# Objective of current study

- Determine if neighborhood level measures of socioeconomic status, racial/ethnic composition and rural/urban status explain observed racial/ethnic disparities in linkage to HIV care

# Methods

- De-identified records of Florida residents who were diagnosed with HIV and reported to the Florida Department of Health Enhanced HIV/AIDS Reporting System during 2014
- Exclusion criteria: **concurrent AIDS**, diagnosis in correctional facility, death within 3 months, missing zip code of residence, age < 13 years
- Individual-level variables
  - Sex at birth
  - Race/ethnicity
  - Country of birth
  - Mode of acquisition
  - Linkage to care 2014 defined as at least one documented lab, medical visit, or prescription in 2014 in eHARS, CAREWare, SDIS, or the Florida AIDS Drug Assistance Program database

# Methods

- Neighborhood-level variables
  - 13 neighborhood-level SES indicators were obtained from the 2009-2013 American Community Survey for all Florida zip code tabulation areas (ZCTAs)
    - These were used to create a poverty index
  - Racial/ethnic composition: % non-Hispanic black (used as a proxy for segregation)
  - Rural/urban status of ZCTA was based on categorization C of version 2.0 Rural-Urban Categorization (RUCA) data codes
- Multilevel analysis conducted to consider spatial clustering at ZCTA level using Proc Glimmix, SAS version 9.4

# Comparison of characteristics between people linked and not linked to care, Florida, 2014, (n=4,319)

	Not in care within 3 months of HIV diagnosis, n (%)	In care within 3 months of HIV diagnosis, n (%)
Total	946 (21.9)	3,373 (78.1)
Miami-Dade County only	270 (24.7)*	825 (75.3)
Race/ethnicity		
Non-Hispanic Black	532 (30.9)**	1,189 (69.1)
Non-Hispanic White	197 (14.4)	1,175 (85.6)
Hispanic	217 (17.7)	1,009 (82.3)

\*P=0.01 compared to all other counties combined, \*\*P<0.0001

Note: 17.3% if you include people with concurrent AIDS (n=5483).

Over 99% have linkage if concurrent AIDS)

# Odds ratios and 95% confidence intervals for non-linkage to HIV care within 3 months among people without concurrent AIDS, Florida 2014

	Crude odds ratio (95% CI)	Odds ratio adjusted for individual level factors (%)*	Odds ratio adjusted for individual and ZCTA level factors**
Non-Hispanic Black	2.67 (2.22-3.20)	2.16 (1.78-2.64)	1.92 (1.55-2.37)
Hispanic	1.28 (1.04-1.58)	1.28 (1.02-1.61)	1.26 (1.00-1.60)
Non-Hispanic White	Referent group	Referent group	Referent group

\*sex, age group, country of birth, HIV transmission mode

\*\*individual plus poverty index, Non-Hispanic Black density, rural/urban classification

# Odds ratios and 95% confidence intervals for non-linkage to HIV care within 3 months among people without concurrent AIDS, Florida 2014

	Odds ratio adjusted for individual and zip code level factors
Race/ethnicity	
Non-Hispanic Black	1.92 (1.55-2.37)
Hispanic	1.26 (1.00-1.60)
Non-Hispanic White	Referent
Sex at birth	
Male	1.69 (1.33-2.13)
Female	Referent
US vs. foreign born	
US born	1.21 (1.01-1.45)
Foreign born	Referent

# Odds ratios and 95% confidence intervals for non-linkage to HIV care within 3 months among people without concurrent AIDS, Florida 2014

	Odds ratio adjusted for individual and zip code level factors
Age group at diagnosis	
13-19 years	Referent
20-39 years	1.18 (0.79-1.75)
40-59 years	0.69 (0.45-1.04)
60 years or older	0.77 (0.46-1.27)
Mode of HIV transmission	
Heterosexual contact	Referent
Men who have sex with men	0.53 (0.42-0.67)
Injection drug use	0.81 (0.55-1.19)
Other/unknown	1.66 (1.27-2.17)

# Odds ratios and 95% confidence intervals for non-linkage to HIV care within 3 months among people without concurrent AIDS, Florida 2014

	Odds ratio adjusted for individual and zip code level factors
Poverty index in zip code	
1 (highest poverty)	0.95 (0.71-1.27)
2	0.83 (0.62-1.11)
3	0.89 (0.67-1.18)
4 (lowest poverty)	Referent
Percent of Non-Hispanic Black in zip code	
<25%	Referent
25-49%	1.32 (1.05-1.68)
≥50%	1.39 (1.08-1.80)
Rural/urban classification in zip code	
Rural	Referent
Urban	0.81 (0.48-1.36)



# Discussion

- Overall 21.9% not linked to care within 3 months (17.3% including people with concurrent AIDS)
- US goal 15% within 1 month
- Non-Hispanic blacks less likely to be linked to care
  - Hispanics also less likely but difference is smaller
- Individual level factors attenuate racial/ethnic difference
- Area level factors attenuate difference
- Male sex, US birth, heterosexual mode of HIV transmission, percent non-Hispanic black associated with non linkage to care

# Possible reasons for non-linkage to care

- Psychosocial reasons (e.g. denial, stigma, fear, lack of symptoms, other priorities)
- Structural reasons (e.g. no health insurance, difficulties making appointments, waiting times, transportation, difficulties navigating system, language barriers)
- Others

# Questions for audience

- In Miami-Dade County what are the greatest barriers to people getting linked to care ?
- All groups have suboptimal linkage to care, but what are unique barriers experienced by Non-Hispanic Blacks and Hispanics that may drive the disparities in linkage that we observe?
- What are the best models in the county to address these barriers?

# Acknowledgments

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# References

Christopoulos, K, Kaplan, B, Dowdy, D, Haller, B, Nassos, P, Roemer, M, Dowling, T, Jones, D, Hare, C. Testing and Linkage to Care Outcomes for a Clinician-Initiated Rapid HIV Testing Program in an Urban Emergency Department. *AIDS Patient Care and STDs*. 2011;25(7):439–444.

Mahle Gray, K, Tang, T, Shouse, L, Li, J, Mermin, J, Hall, H. Using the HIV Surveillance System to Monitor the National HIV/AIDS Strategy. *American Journal of Public Health*. 2013;103(1):141–147.

National HIV/AIDS Strategy. (2015). Retrieved from <https://www.whitehouse.gov/administration/eop/onap/nhas/>

State HIV/AIDS slide sets. (2015). Retrieved from <http://www.floridahealth.gov/diseases-and-conditions/aids/surveillance/epi-slide-sets.html>

Trepka, M. J., Niyonsenga, T., Maddox, L., Lieb, S., Lutfi, K., & Pavlova-Mccalla, E. (2013). Community Poverty and Trends in Racial/Ethnic Survival Disparities Among People Diagnosed With AIDS in Florida, 1993–2004. *American Journal of Public Health*, 103(4), 717-726.

Trepka, M. J., Fennie, K. P., Sheehan, D. M., Lutfi, K., Maddox, L., & Lieb, S. (2014). Late HIV Diagnosis: Differences by Rural/Urban Residence, Florida, 2007–2011. *AIDS Patient Care and STDs*, 28(4), 188-197.

Trepka, M. J., Fennie, K., Sheehan, D., Niyonsenga, T., Lieb, S., & Maddox, L. (2016). Racial-ethnic differences in all-cause and HIV mortality, Florida, 2000–2011. *Annals of Epidemiology*. In Press

Zúñiga M, Brennan J, Scolari R, Strathdee S. Barriers to HIV Care in the Context of Cross-Border Health Care Utilization among HIV-Positive Persons Living in the California/Baja California US-Mexico Border Region. *Journal of Immigrant and Minority Health* 2007;10:219–227.

# Racial/ethnic disparities in all-cause mortality, Floridians with AIDS, 1993-2004

- Adjusting for age, country of birth, mode of transmission and CD4 count/percent
- Non-Hispanic Black: Non-Hispanic White men hazard of death (similar for women)
  - 1993-1995: **1.12** (95% CI : 1.07-1.18)
  - 1996-1998: **1.44** (95% CI: 1.34-1.55)
  - 1999-2001: **1.28** (95% CI: 1.17-1.40)
  - 2002-2004: **1.26** (95% CI: 1.14-1.41)
  - But with controlling for neighborhood poverty **1.10** (95% CI 0.97, 1.25)
- Hispanic: Non-Hispanic White men (similar for women)
  - 1993-1995: **1.09** (95% CI : 1.02-1.16)
  - 1996-1998: **1.19** (95% CI: 1.08-1.30)
  - 1999-2001: **1.13** (95% CI: 1.13-1.56)
  - 2002-2004: **1.11** (95% CI: 0.96, 1.27)