A Survival Comparison between HIV+ U.S.-born Latinos and Foreign-born Latinos in Houston, Texas 1990 - 2001

Raouf Arafat, MD, MPH, Adebowale Awosika-Olumo MD, MS, MPH, James Gomez, BA, Marcia Wolverton MPH, Lydwina Anderson, BS

Background

- The ASD (Adult/Adolescent Spectrum of HIV/AIDS Disease) Project is a CDC National Surveillance Study conducted in collaboration with 10 state and local health departments, including Puerto Rico

- ASD is a longitudinal medical record study of HIV+ persons, which provides a method to monitor the trends and the full spectrum of HIV-related illnesses

- ASD is a systematic sample of Houston/Harris County cumulative HIV/AIDS infected persons in public facilities

Objectives of this Data Analysis

- To examine the incidence density rate (IDR) difference between Foreign-born and U.S.-born Latinos in contracting HIV opportunistic infections

- To examine the health service utilization rate between Foreign-born and U.S.-born Latinos

- To determine the statistical significance between mean survival times of Foreign-born and U.S.-born Latinos

- To undertake a survival comparison between HIV+ Foreign-born and U.S.-born Latinos and to determine if mortality is associated with:

  - Diagnosed substance abuse (drugs and alcohol abuse)

  - Mental health conditions (depression and psychosis)

Methods: Data Collection Sites

Public Hospitals / Clinic Institutions:

Northwest Health Center
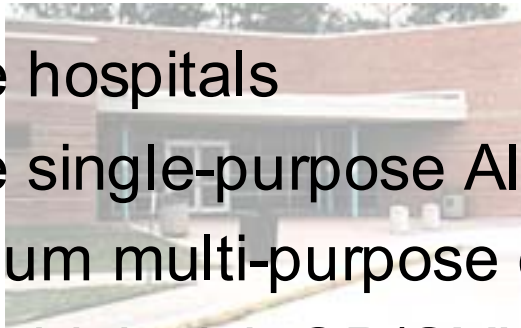
Thomas Street Health Center

- 2 large hospitals
- 1 large single-purpose AIDS clinic
- 1 medium multi-purpose clinic
- 1 small high-risk OB/GYN clinic

Ben Taub General Hospital

Lyndon Baines Johnson (LBJ) General Hospital

Methods: Study Population

- HIV+ Latinos, $\geq$13 yrs of age (N=865)

- Received care at public hospitals/clinics (representative HIV facilities in Houston)

- U.S.-born Latinos (n=476)

- Foreign-born Latinos (n=389) - Reference Group

Methods: Data Abstraction

- **Data Types Collected**
  - ☐ Opportunistic (OIs) and other infections and conditions
  - ☐ Treatments and prophylaxis
  - ☐ Viral loads, CD4 counts, antiretroviral resistance testing
  - ☐ Hematology

- **Initial Medical Record Abstraction**
  - ☐ Capture 12 months of medical history data before patient's HIV+ diagnosis
  - ☐ Collect demographics
- **Follow-up Abstraction**
  - ☐ Capture medical history data every six months until death, lost to follow-up or relocation

Methods: Data Analysis

Incidence density rate[1]:

- Determined using first episode of opportunistic infection (OI) and other conditions, expressed as event / per 100 person-years

Statistical analysis[2]:

- Kaplan Meier curves and the log rank test were used to analyze the two groups in the current study

- Cox proportional regression analysis was used to evaluate the effects of different factors on survival using the forward stepwise (conditional LR) method, and an analysis of the interaction of key variables with the group variable was performed

1) Computation program (PAMCOMP) was utilized for calculating exact person-years (documentation: Epidemiology 9/2000, Vol. 11 No. 5)
2) SPSS statistical program was used for statistical analysis

Results

Table 1: Demographic Characteristics and CD4 Counts of U.S. and Foreign-born Latinos in the ASD Project, Houston, Texas 1990–2001
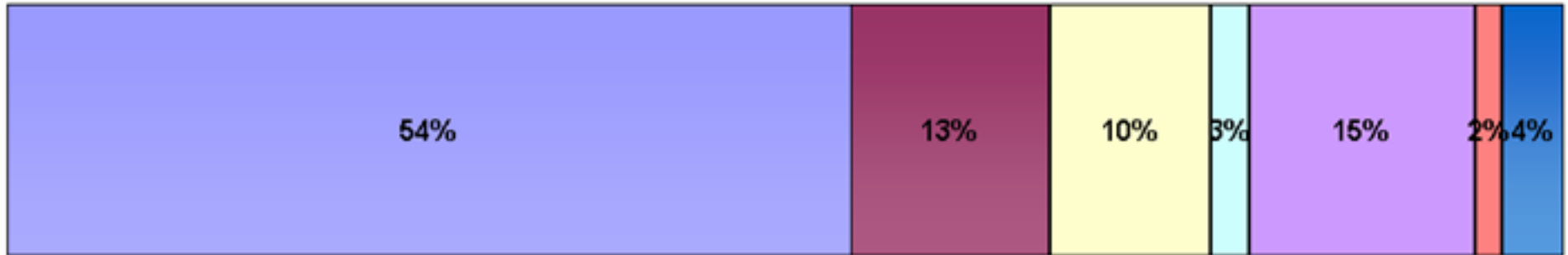
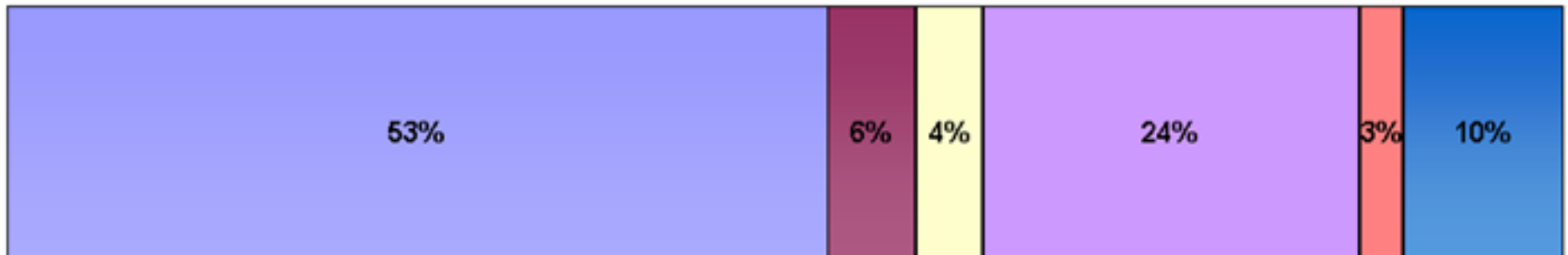| Characteristic	U.S. - born Latinos (n = 476)		Foreign - born Latinos (n = 389)	
	Number	*Percent*	*Number*	*Percent*
Age at enrollment				
<20	13	3	9	2
20–29	149	31	138	36
30–39	212	46	167	43
40–49	81	17	55	14
>=50	21	4	20	5
Mean age (SD)	33 (8.4)		33 (9.0)	
Gender				
Male	403	85	299	77
Female	73	15	90	23
CD4 mean count[a]				
< 200 cells/µl	274	62	219	61
> 200 cells/µl	177	38	136	39

Figure 1: Behavioral Risk Factors among U.S. and Foreign-born Latinos in the ASD Project, Houston, Texas 1990-2001

Table 2: Relative Risk (RR) of Opportunistic Infections among U.S. and Foreign-born Latinos in the ASD Project, Houston, Texas 1990-2001

Opportunistic Infection*	U.S.-born Latino 1990 - 1995 N(Rate)	Foreign-born Latino N(Rate)	RR	95% CI	U.S.-born Latino 1996 - 2001 N(Rate)	Foreign-born Latino N(Rate)	RR	95% CI
Burkitt's lymphoma	--	--	--	--	3(0.4)	1(0.1)	2.9	(2.1 - 3.7)
Candidiasis esophageal	58(4.5)	26(3.0)	1.5	(1.0 - 2.0)	7(0.8)	11(1.4)	0.6	(0.6 - 0.6)
Candidiasis lungs	2(0.2)	--	--	--	--	1(0.1)	--	--
Cytomegalovirus disease	24(1.9)	15(1.2)	1.6	(1.1 - 2.1)	1(0.1)	10(1.2)	0.1	(0.1 - 0.1)
Cytomegalovirus retinitis	39(3.1)	28(2.2)	1.4	(0.9 - 1.9)	5(0.6)	7(0.8)	0.7	(0.7 - 0.7)
Cryptococcosis	31(2.4)	26(2.0)	1.2	(0.7 - 1.7)	--	--	--	--
Cryptosporidiosis	13(1.0)	8(0.6)	1.6	(1.1 - 2.2)	3(0.4)	4(0.5)	0.8	(0.7 - 0.8)
HIV encephalopathy	7(0.5)	6(0.5)	1.2	(0.7 - 1.6)	4(0.5)	1(0.1)	4.0	(3.1 - 4.9)
Histoplasmosis	8(0.6)	3(0.2)	2.7	(2.0 - 3.3)	6(0.7)	7(0.8)	0.9	(0.8 - 0.9)
Chronic mucocutaneous herpes	8(0.6)	4(0.3)	2.0	(1.4 - 2.6)	--	--	--	--
Immunoblastic lymphoma	3(0.2)	5(0.4)	0.6	(0.6 - 0.6)	2(0.2)	--	--	--
Kaposi's sarcoma	55(4.3)	31(2.4)	1.8	(1.2 - 2.3)	6(0.7)	9(1.1)	0.7	(0.6 - 0.7)
Mycobacterium avium complex	45(3.5)	31(2.4)	1.5	(0.9 - 2.0)	8(1.0)	8(1.0)	1.0	(0.5 - 1.5)
Atypical mycobact diagnosed	4(0.3)	1(0.1)	4.0	(3.2 - 4.8)	--	2(0.2)	--	--
Pneumocystis carinii pneumonia	134(10.5)	78(6.1)	1.7	(1.2 - 2.3)	30(3.6)	45(5.4)	0.7	(0.6 - 0.7)
Primary lymphoma of brain	3(0.2)	2(0.2)	1.5	(1.0 - 2.0)	--	2(0.2)	--	--
Progress multifoc leukoenceph	3(0.2)	2(0.2)	1.5	(1.0 - 2.0)	1(0.1)	1(0.1)	1.0	(0.5 - 1.5)
M. tuberculosis, pulmonary	17(1.3)	12(0.9)	1.4	(0.9 - 1.9)	4(0.5)	19(2.3)	0.2	(0.2 - 0.2)
Pneumonia recurrent	1(0.1)	1(0.1)	1.0	(0.6 - 1.4)	3(0.4)	6(0.7)	0.5	(0.5 - 0.5)
M. tuberculosis	13(1.0)	19(1.5)	0.7	(0.7 - 0.7)	3(0.4)	3(0.4)	1.0	(0.5 - 1.5)
Toxoplasmosis of brain	24(1.9)	28(2.2)	0.9	(0.8 - 0.9)	18(2.1)	42(5.0)	0.4	(0.4 - 0.5)
Wasting syndrome	7(0.5)	10(0.8)	0.7	(0.7 - 0.7)	2(0.2)	9(1.1)	0.2	(0.2 - 0.2)

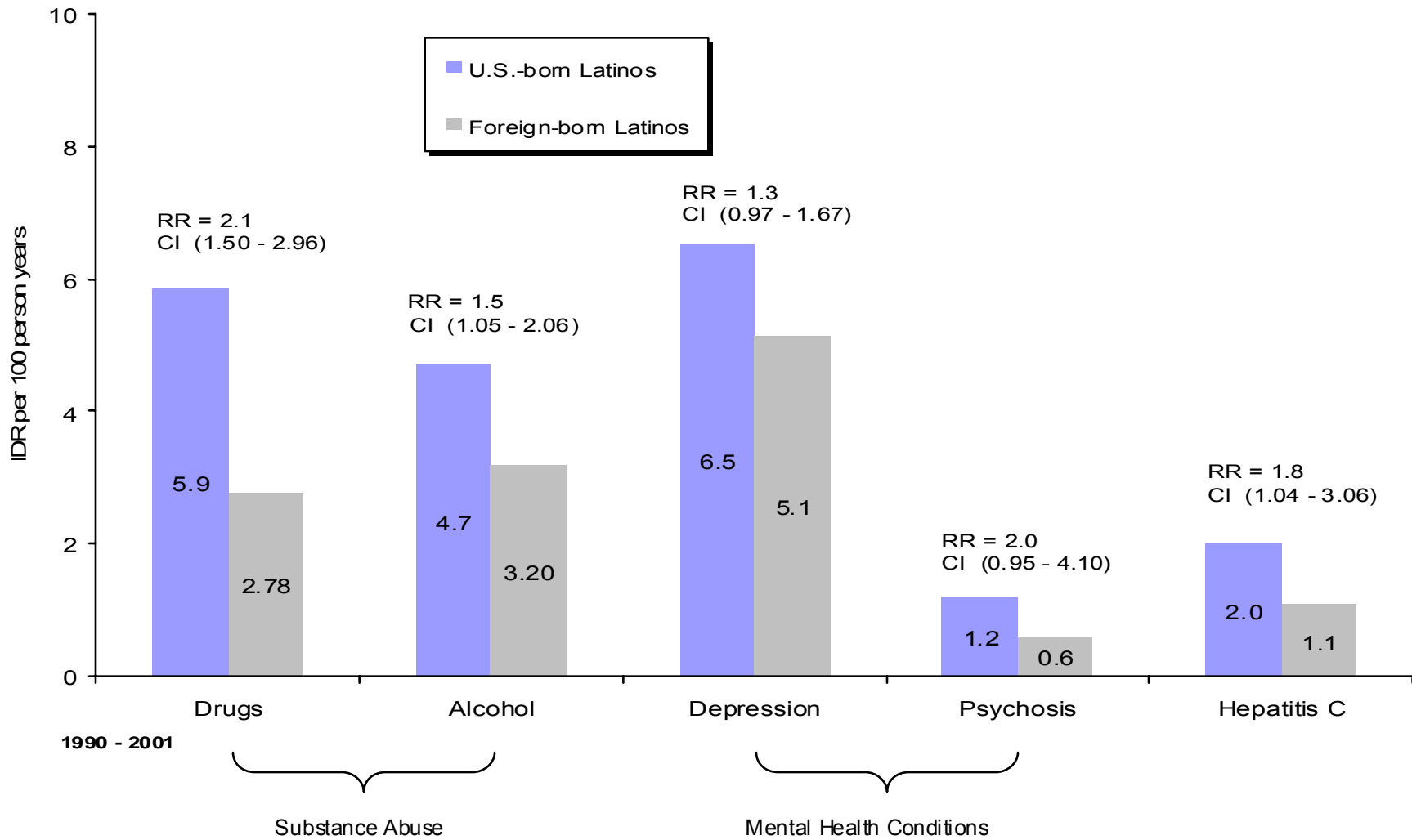* Opportunistic infections diagnosed < 3 omitted.

Figure 2: Comparison of the relative risks of substance abuse, mental health conditions, and hepatitis C among Foreign-born versus U.S.-born Latinos in the ASD Project, Houston, Texas 1990 – 2001

Table 3: Health Services Utilization of U.S. and Foreign-born Latinos in the ASD Project, Houston, Texas 1990-2001

	U.S.-born Latinos n=476	Foreign-born Latinos n=389	Significance
Outpatient visits			
Patients with ≥ 1 visits (%)	92.9	85.6	
Mean visits (per 100 person-yrs)	10.8	14.0	ns
Emergency department visits			
Patients with ≥ 1 visits (%)	26.3	24.5	
Mean visits (per 100 person-yrs)	8.2	8.6	ns
Hospitalizations			
Patients with ≥ 1 admissions (%)	49.2	56.6	
Mean number of admissions (per 100 person-yrs)	17.5	27.7	ns
Mean number of days in care (per 100 person-yrs)	86.3	157.4	0.03*
ICU			
Patients with ≥ 1 days in care (%)	2.5	3.6	
Mean number of days in care (per 100 person-yrs)	3.0	5.0	ns

$* = P < .05$

ns = not significant (p > 0.05)

Characteristic	Mean Survival Time (months)	CI
Foreign-Born	95	88 - 103
U.S. Born	78	72 - 84

Log Rank test
P = .0015

Foreign-born Latinos (n=389)
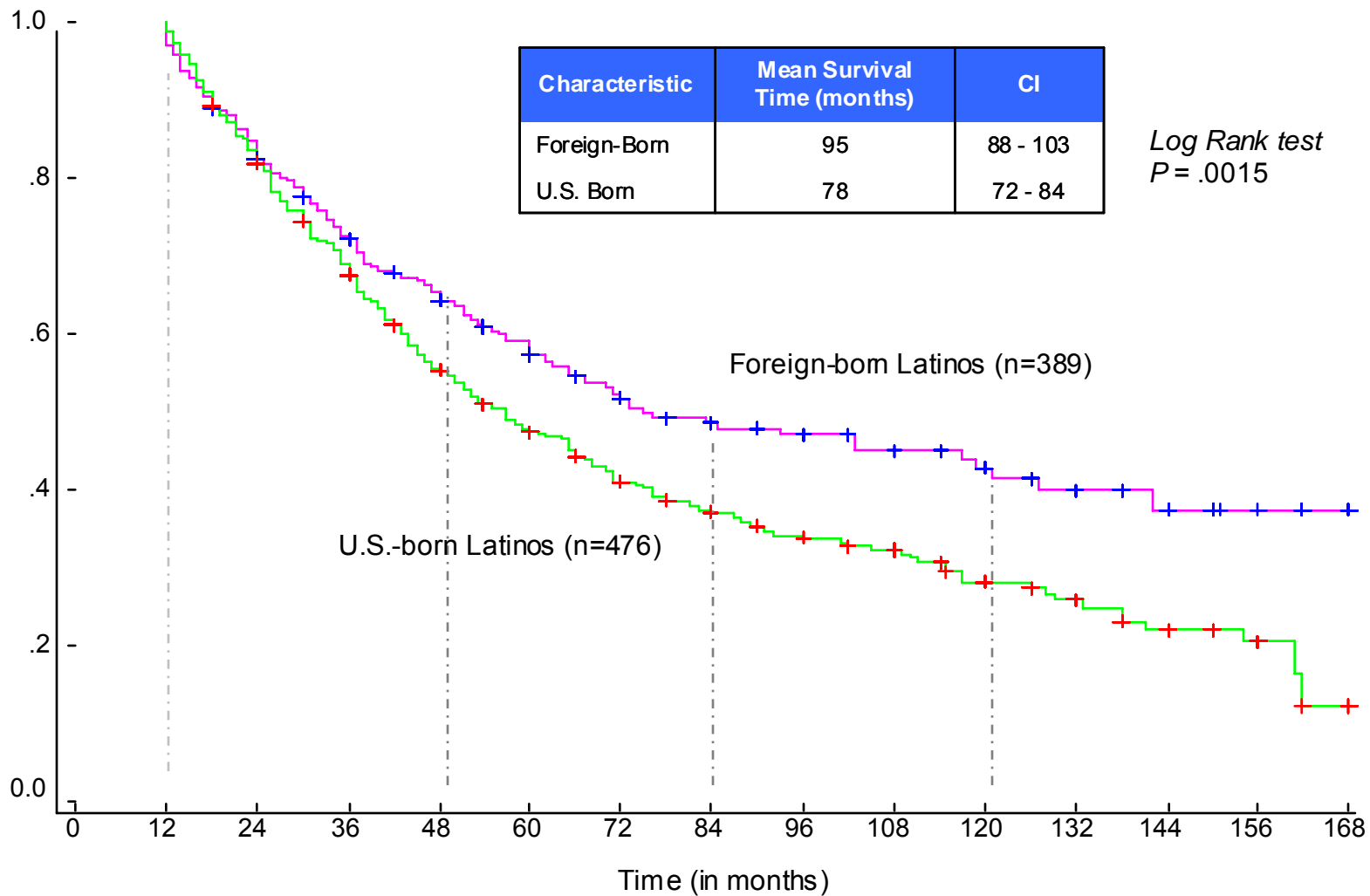
U.S.-born Latinos (n=476)

Time (in months)

Figure 3: Kaplan-Meier survival comparison curve of HIV+ Latinos in the ASD Project Houston, Texas 1990 – 2001
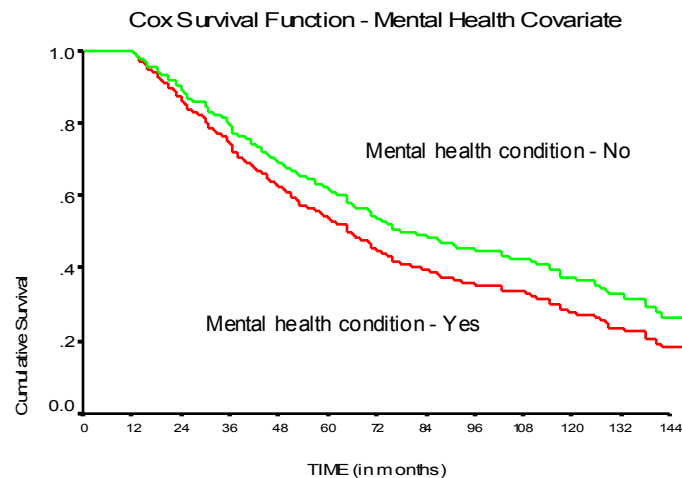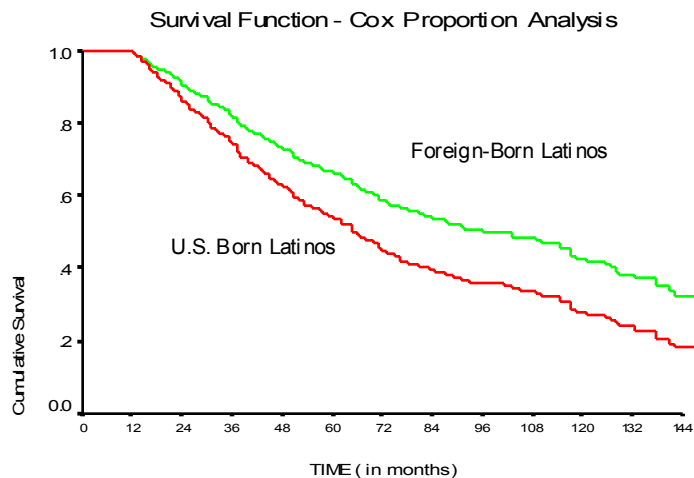
Table 4: Cox Proportional Regression Analysis for HIV+ Latinos in the ASD Project, Houston, Texas 1990 – 2001

Characteristic	B	SE	Adjusted HR (95% CI)[†]
Group (U.S.-born vs Foreign-born)	0.403	0.101	**1.5** (1.23 - 1.82)**
CD4 mean cell count (<200 vs >=200 cells/µl)	2.003	0.142	**7.4** (5.61 - 9.79)***
Mental health condition (yes vs no)	0.255	0.108	**1.3** (1.04 - 1.60)*

[†]Adjusted for gender, age, and behavioral risk factors; HR = Hazard Ratio

* = p < .01; ** = p <.001; *** = p <.0001

Survival Function - Cox Proportion Analysis

Foreign-Born Latinos

U.S. Born Latinos

Cumulative Survival — TIME (in months)

Cox Survival Function - Mental Health Covariate

Mental health condition - No

Mental health condition - Yes

Cumulative Survival — TIME (in months)

Limitations

- Cases in this study were limited to Latino persons in public hospitals / clinics

- Income and education levels were not available for evaluating the role of socioeconomic factors of the study population

- Mortality information for Foreign-born Latinos who return to their country of origin was not available ("Salmon bias")
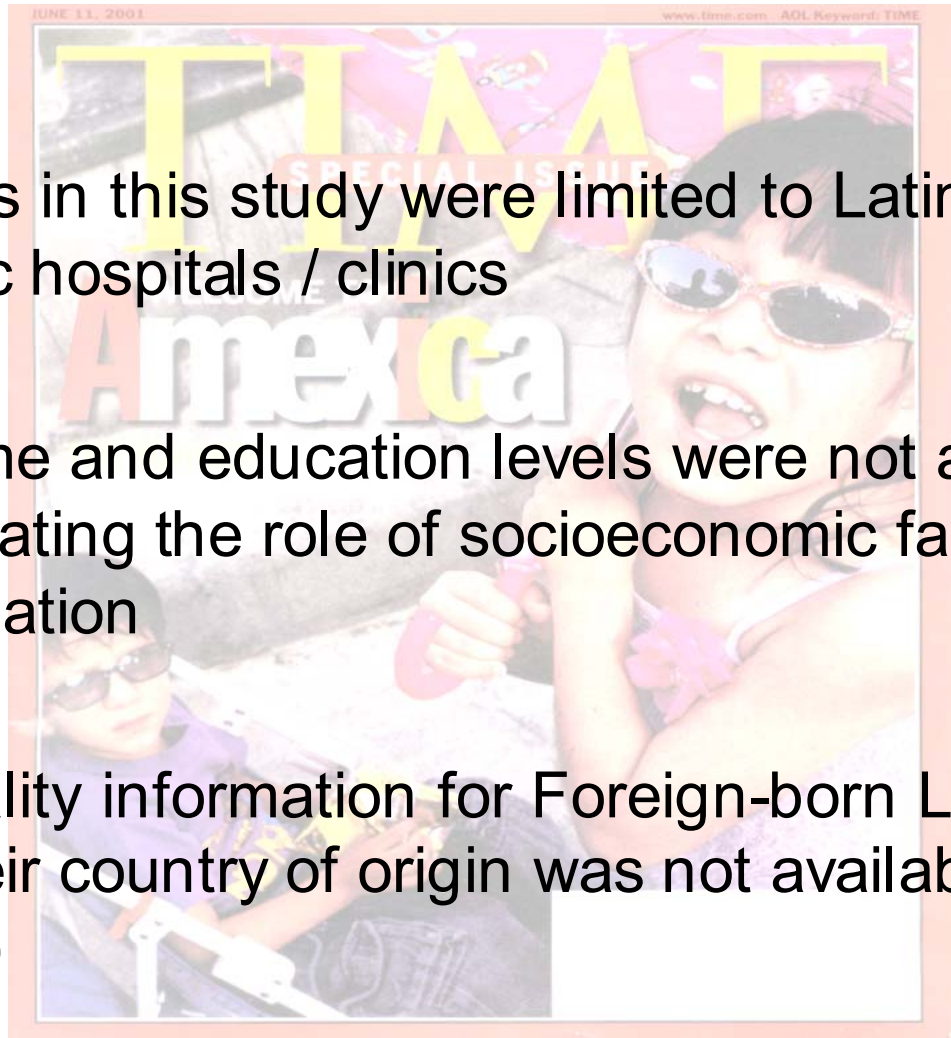
Conclusions

- Kaplan–Meier univariate analysis showed that HIV+ U.S.-born Latinos have less favorable survival outcomes than Foreign-born Latinos

- On a Cox regression model, mental health and a mean CD4 count of <200 cells/µl, were variables significantly associated with mortality

- Foreign-born Latinos may benefit more from traditional social support mechanisms and possibly the "healthy worker effect" more than U.S.-born Latinos resulting in a longer mean survival experience
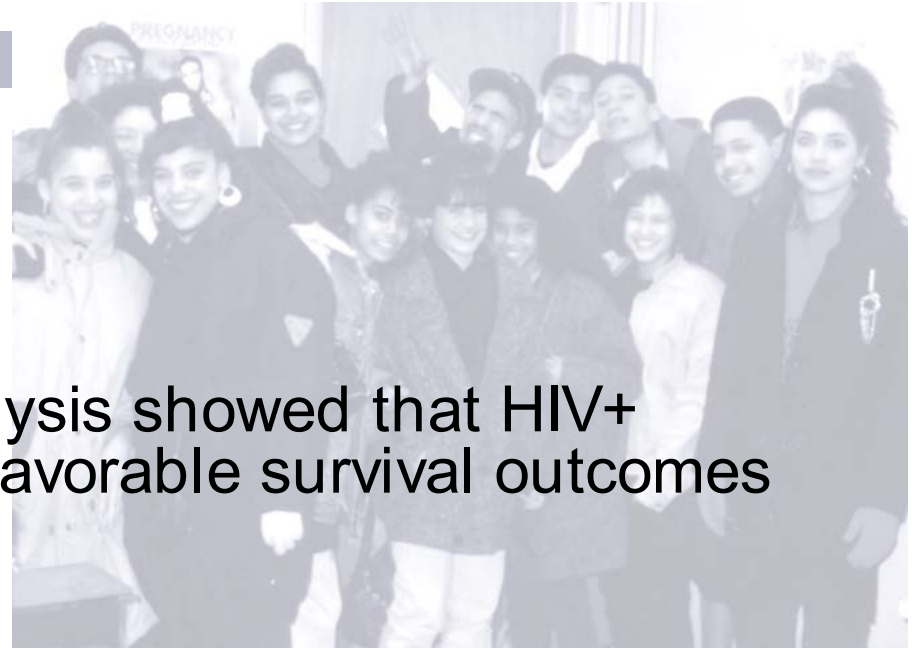
Acknowledgements

- The Bureau of Epidemiology Staff especially thank the following:

  Salma Khuwaja

  Taiwo Fasoranti

  Osaro Mgbere

  Brian Goldberg

  Karen Miller

  Joanne Wei

Foreign-born Country of Origin	N	%
Mexico	265	68%
Honduras	43	11%
El Salvador	25	6%
Cuba	10	3%
Colombia	10	3%