

*Differential Mortality  
Patterns among  
Nicaraguan Immigrants  
and Native born in  
Costa Rica, 1996–2005*

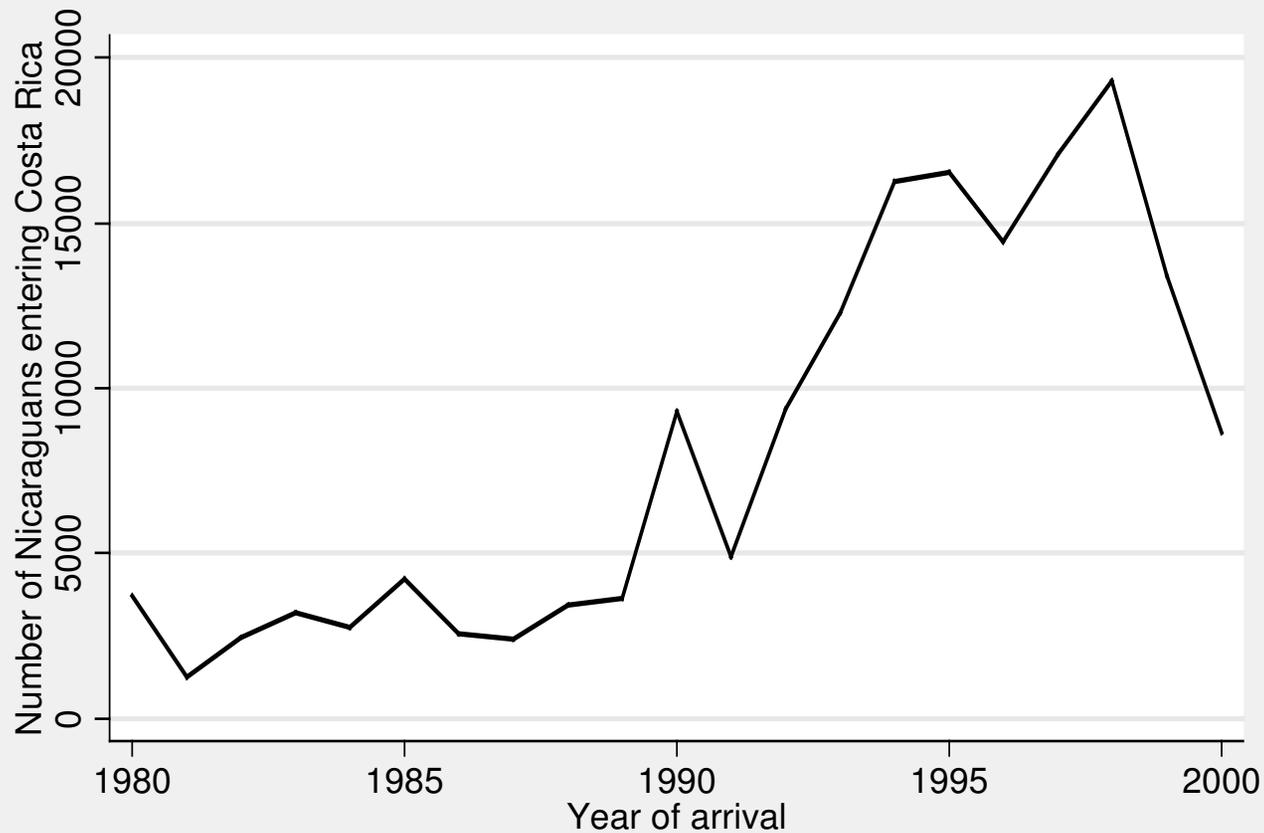
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# Research Support

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- Harvard University
- Oficina Internacional de Migración
- Fulbright Scholar Program

# Migración Nicaragüense



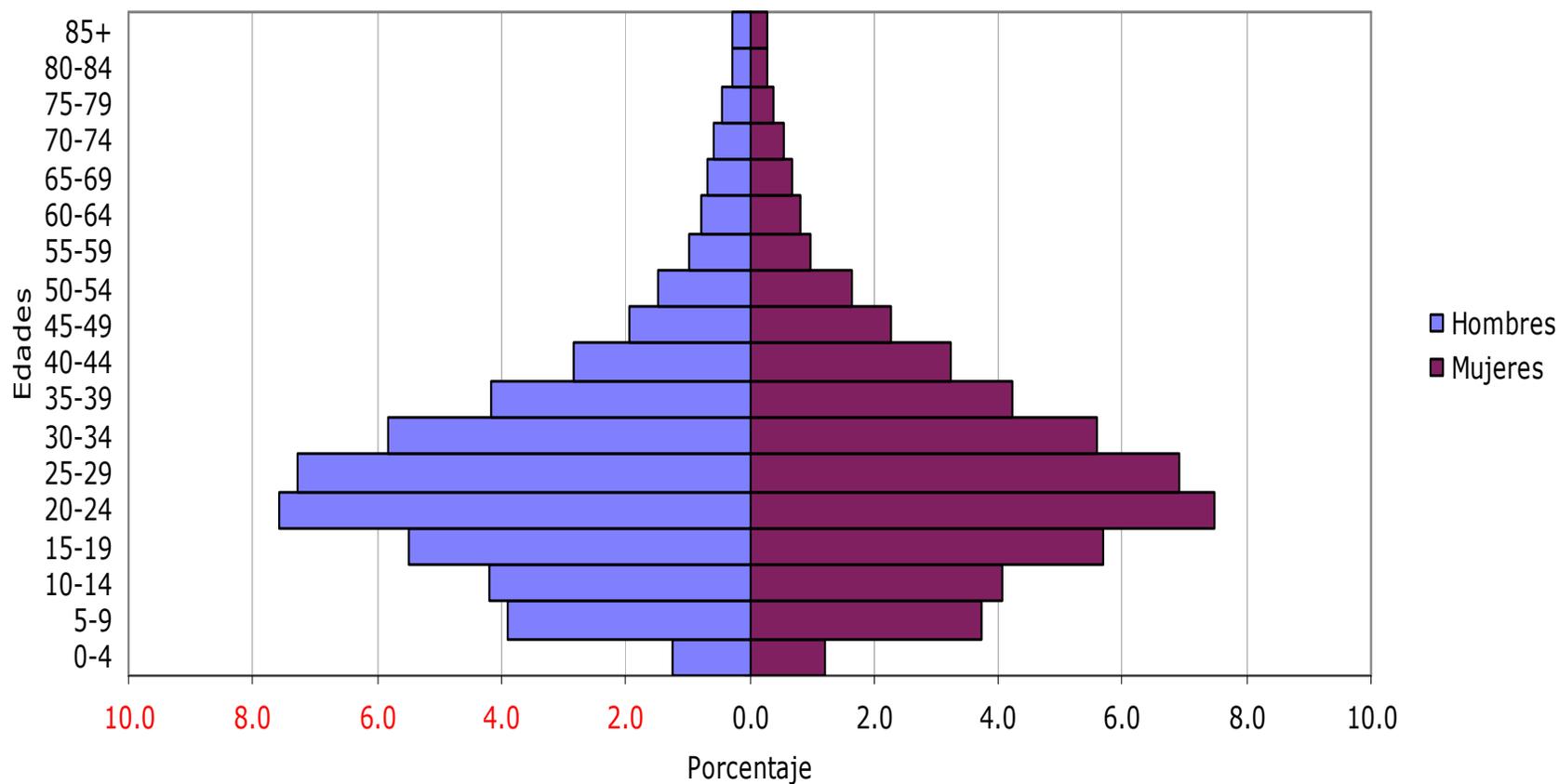
Source: Costa Rican National Census, INEC 2000

# Censo 2000

- **Population distribution**
  - **Few under 15 migrants (children are CR)**
  - **Large population 20-40**
  - **Above 40 population is similar**
- Underestimation
- Actual rates are likely to be lower
- Differential age distribution is not so extreme that it confounds analysis

# Población total de Nicaragüenses = 226,374

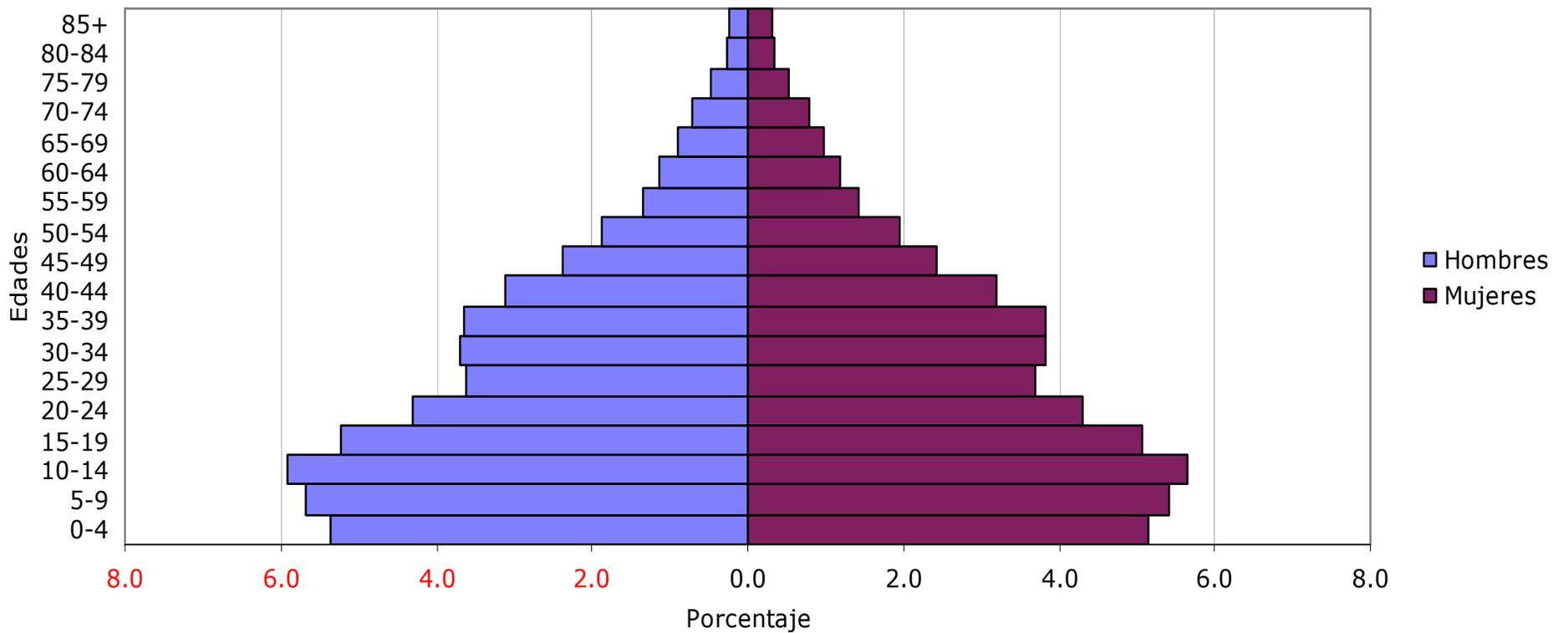
Distribución de la población de los inmigrantes nicaragüenses en Costa Rica,  
2000.



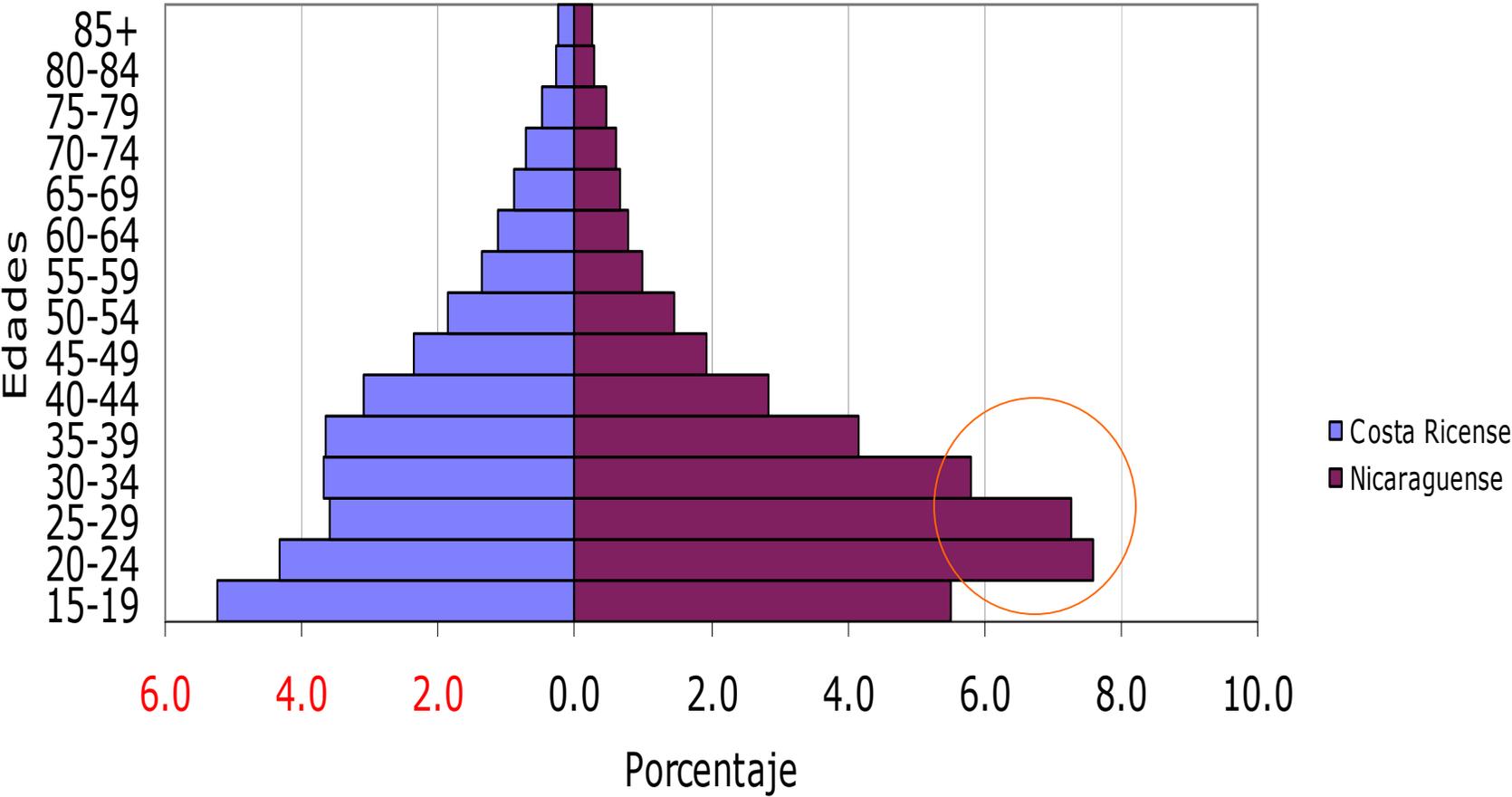
# Población de Costarricenses

## Nativos = 3,518,110

Distribución de la población de Costa Rica, 2000.



# Comparison of male population distributions



# Region

Region	Costa Rican	Nicaraguan
Valle Central	63 %	58%
Chorotega	8 %	9%
Pacifico Central	6 %	4%
Pacific Sur	8 %	2%
Huetar Atlantico	10 %	12%
Hueatar Norte	5 %	14%

# SES

Empleado	46% / 18%	64% / 30%
Pobresa	33%	47%
Educación	56%	65%
Concentración residencial	17%	46%
No Segurados	19%	40%

# Defunciones 1996-2005

## **Costa Rican**

- *Men (n =80,220)*
- *Women (n=61,588)*

## **Nicaraguan**

- *Men (n =3,294)*
- *Women (n=2,078)*

# Crude Rate

$$\frac{\text{Numerator}}{\text{Denominator}} = \text{Rate}$$

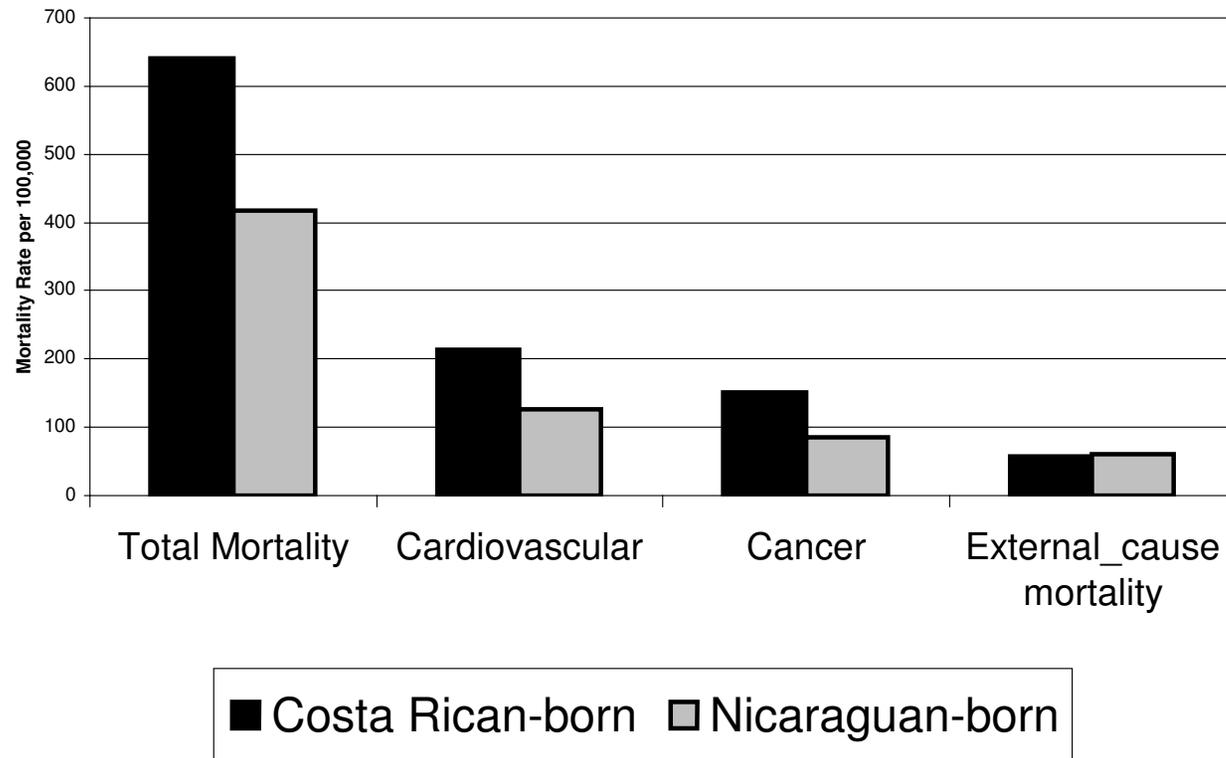
$$\frac{\# \text{ deaths } 1996-2005 / 10}{\text{Population in } 2000 \text{ census}} = \text{Rate}$$

# Age standardized rates

- Accounts for differences in population distribution by fitting both populations to a standard population
- Direct method used

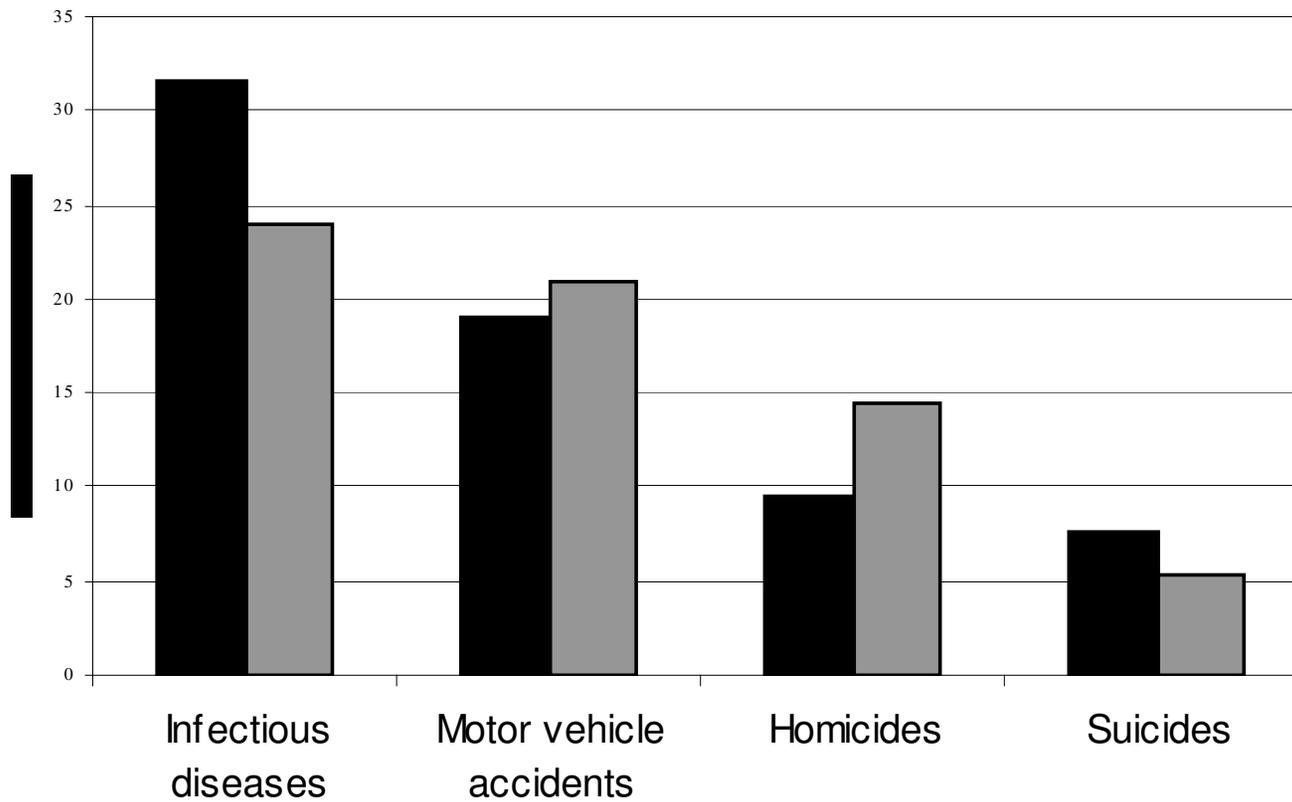
# Resultados

- Age standardized rates



# Resultados

Age standardized rates



# District level analysis

- Allows for estimation of the effects of sociodemographic factors
- Poisson Regression used to determine rate ratios
- Stratify analysis when covariates found to interact strongly

# All-cause mortality

- Factors examined
  - Urbanization
  - % Nicaraguan-born residents
  - unemployment
  - Educational attainment
  - Poverty
  - Region

# All-cause mortality

- Increased risk was associated with residence in a district with:
  - High degrees of urbanization
  - Greater than 10% Nicaraguan-born residents
  - High rates of Unemployment
  - Location in Huetar Atlantico





# Homicide

Covariate	RR (p<.001)
Nicaraguan-born	1.38
Male sex	6.55
High poverty area	1.53
High unemployment area	1.28
High %Nicaraguan-born	1.82
Urban vs Rural	2.02
Huetar Atlantico	1.91

# Regression Model

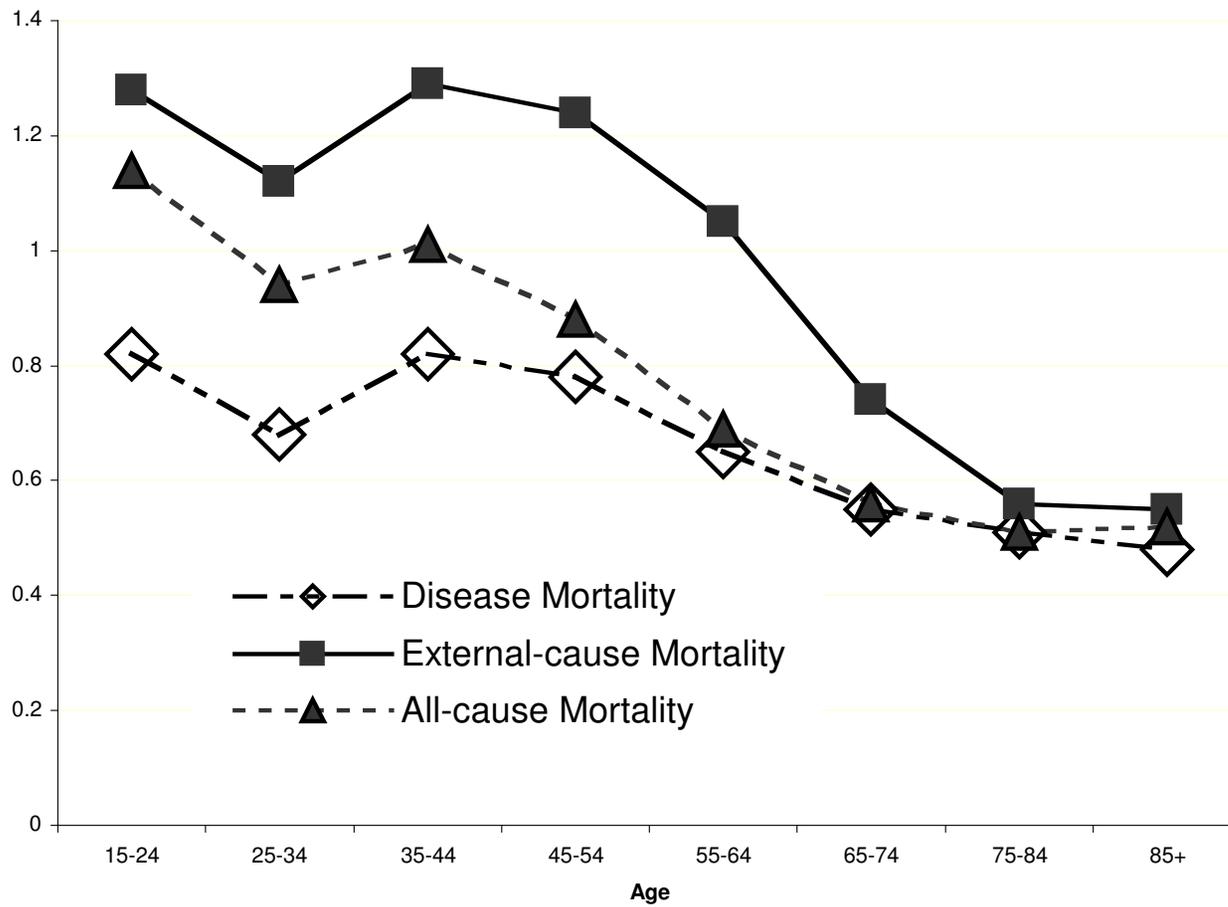
## Limitations

- Assumes the effect of Place of birth is not dependent on other independent variables included in the model
- Relies on district level data  
example "Bajo los Anonos" is in San Rafael de Escazu and La Carpio is in Pavas

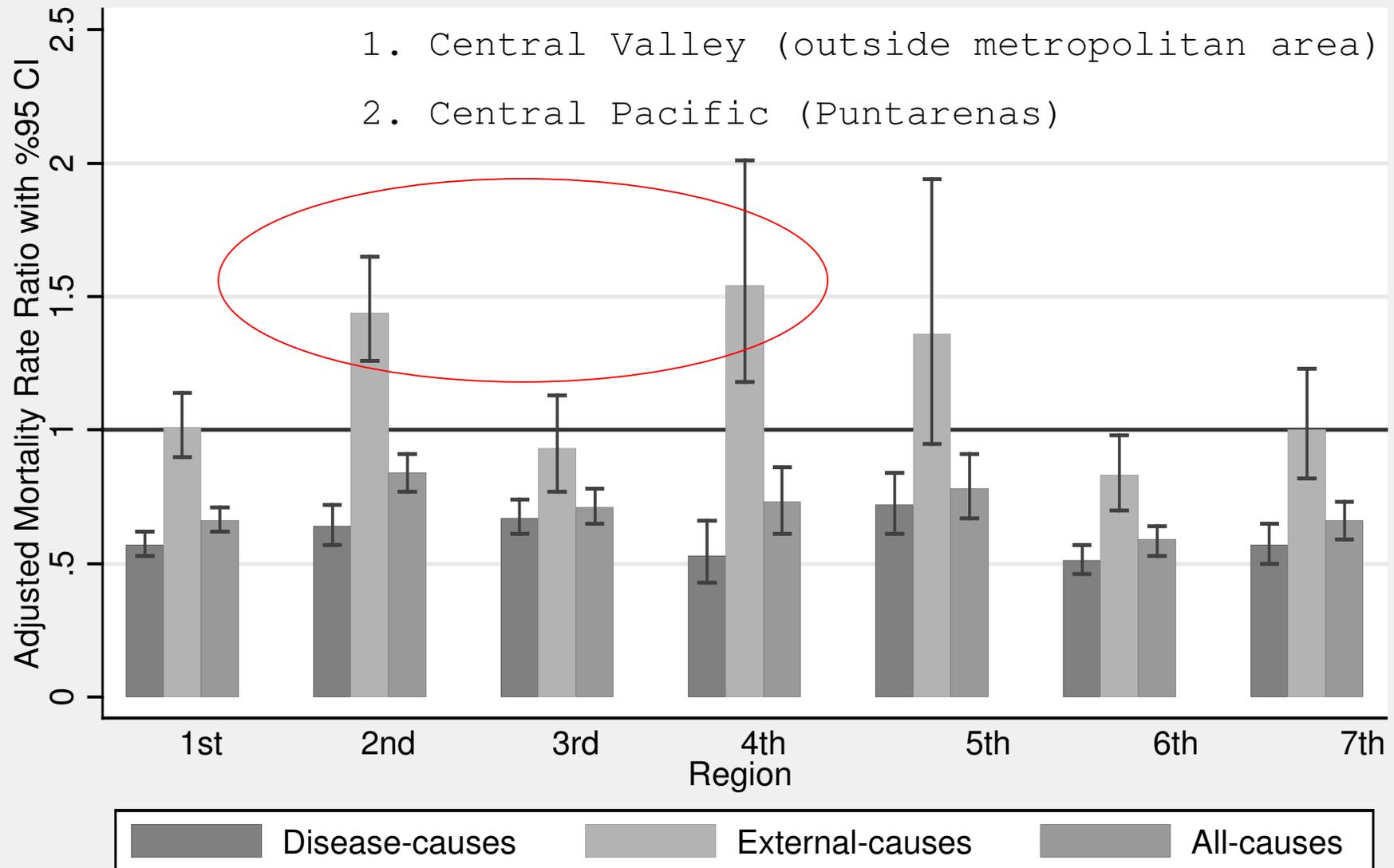
# Stratified Analysis

- Age
- Region
- %Nicaraguan residents by quartile

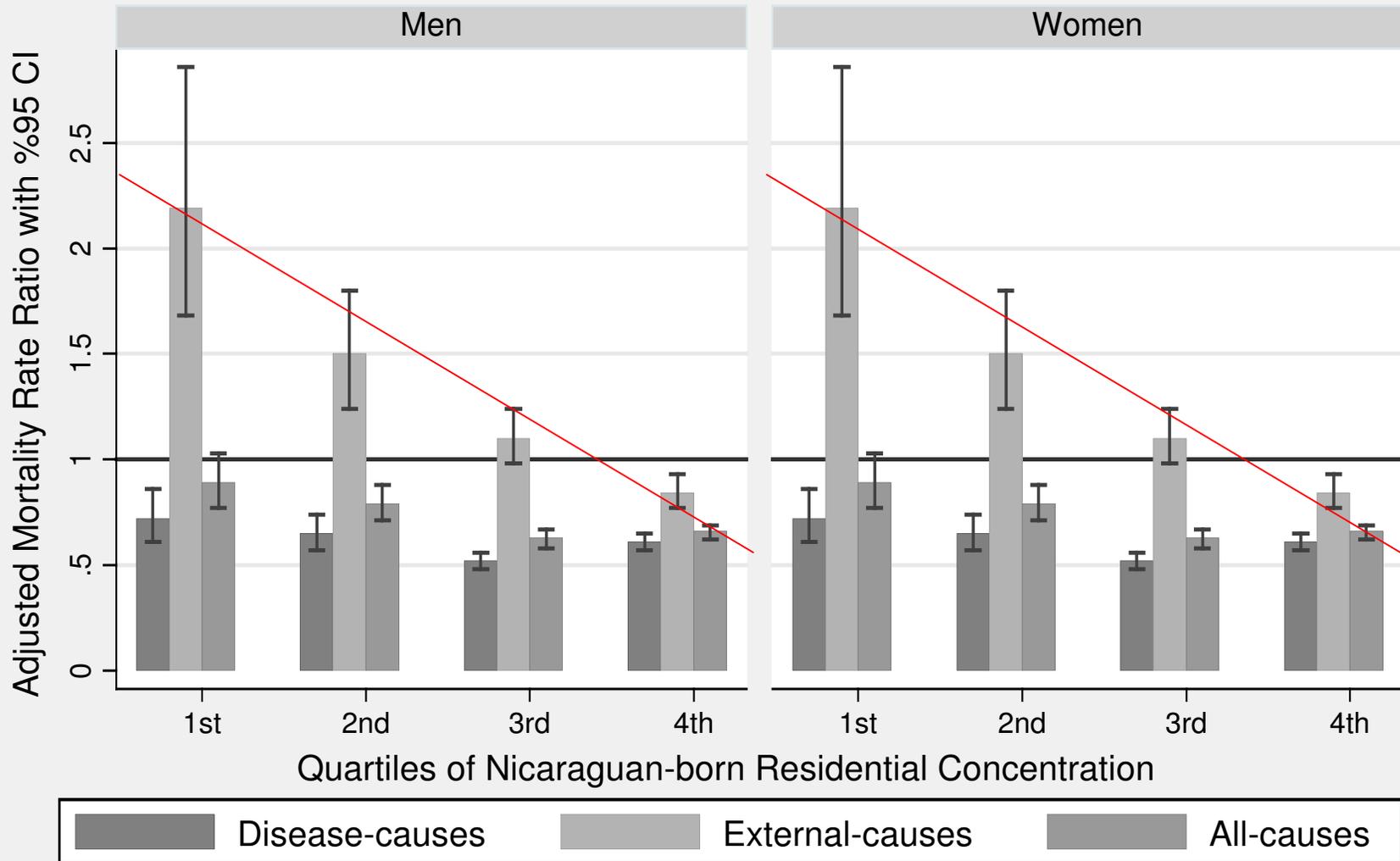
# Age Specific rates adjusted for SES



# Region Specific Rates



# Residential Segregation



Graphs by sex

# Discussion

- 1) Overall Nicaraguans are significantly healthier than their Costa Rican-born counterparts
  - Total mortality risk reduced by over 30% vs Costa Rican-born

# Discussion

2) Both men and women are at significantly greater risk from Homicide.

-As much as 30% of this risk is explained by sociodemographic factors

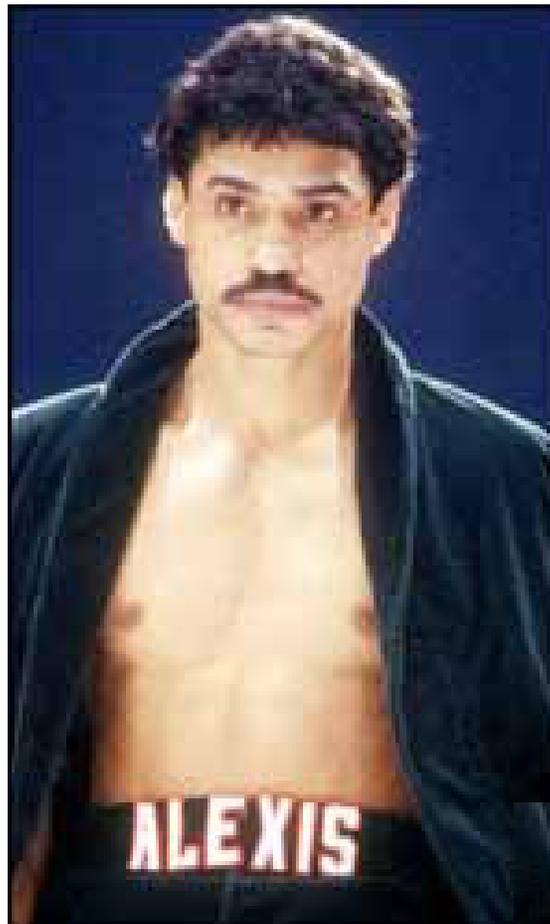
-However a 38% increased risk remains

# Discussion

3) Residential concentration of fellow Nicaraguan-born residents has a strong protective effect against External-cause mortality, most importantly, homicide.

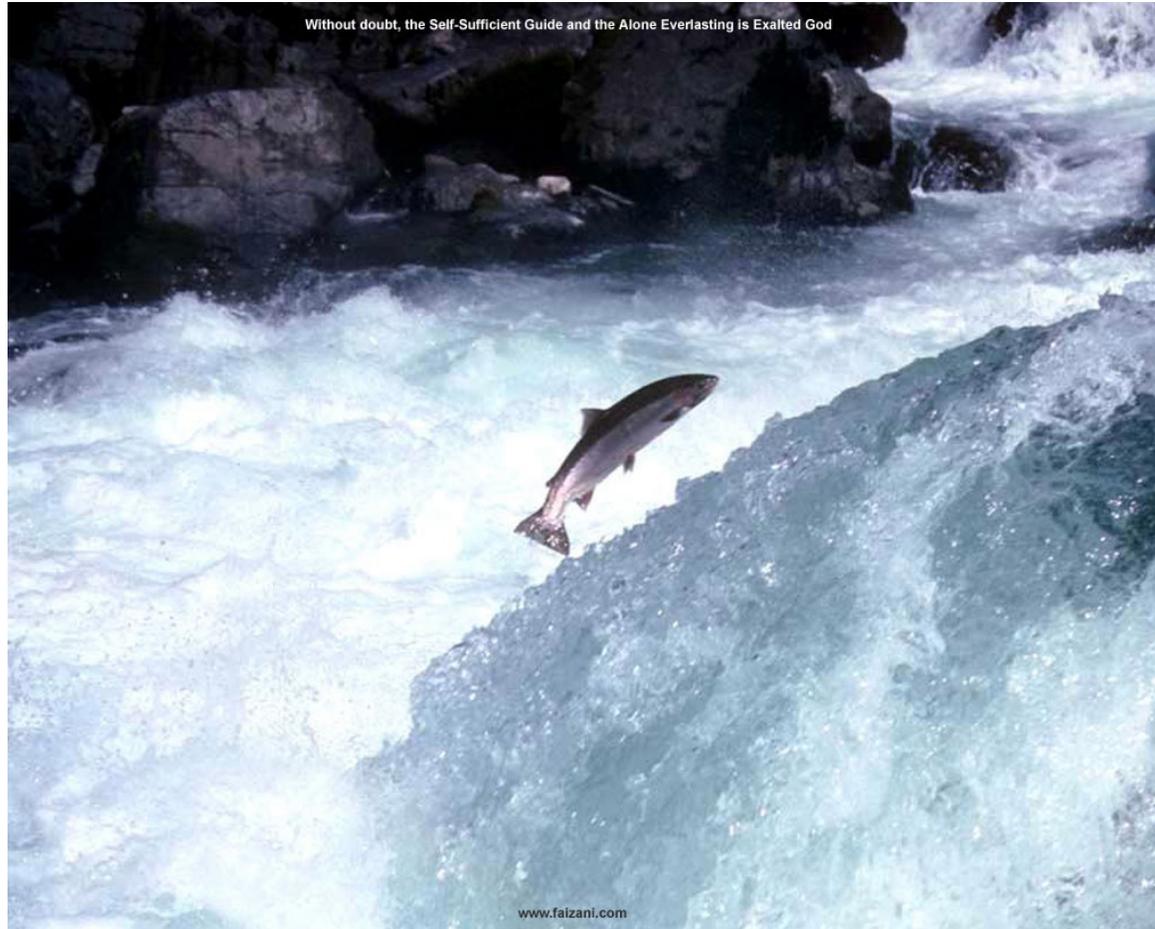
# Towards an explanation

- Healthy Immigrant effect



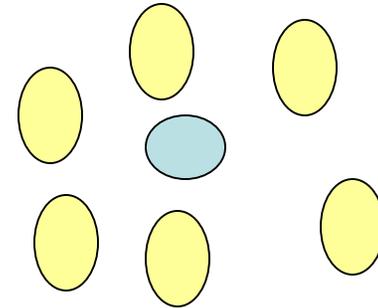
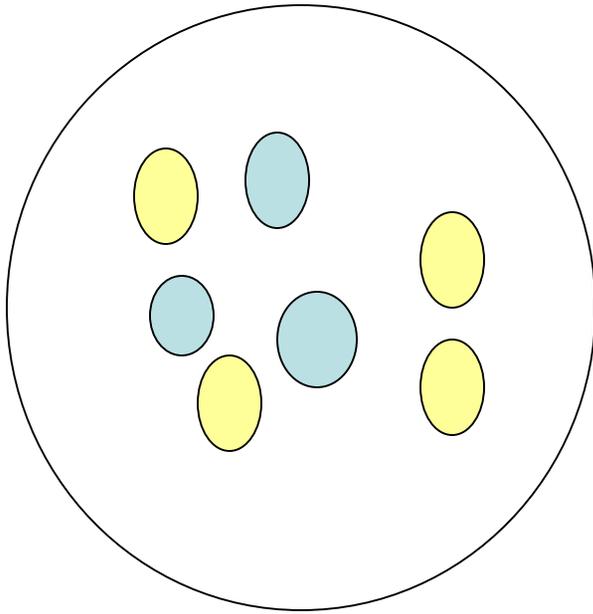
# Towards an explanation

- Salmon effect



# Towards an explanation

## **Integration vs. exclusion**



# Discussion

- Final considerations from experiences in La Carpio and Bajo Los Anonos

# Acknowledgements

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