

Spatial inequities in life expectancy in small areas of Buenos Aires, Argentina 2015-2017

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Background

Latin America

Urbanization process

Social representation
of cities

Unequal region



Background

While...

...there has been (and will continue) an expressive development of research related to inequity and life events,

...most focuses on large or median areas

...the degree to which high quality data is (publicly) available is an issue which may impede to advance small area estimates

...National/Local agencies for Health Statistics are subject to data confidentiality restrictions/interpretations (Law 17.622)

(Almeida-Filho, 2020; Harrison et al, 2017; DEIS, 1998)



Background

- 92% of Argentina's population live in urbanized areas
- Buenos Aires is the largest urban agglomeration in the country (2,890,151 inhabitants)
- 7.2 percent of Argentina's population
- 200 km²
- 1947-2010, a median population variability of 3.000.000 inhabitants
- Since 2005 it has undergone through an administrative and political decentralization process

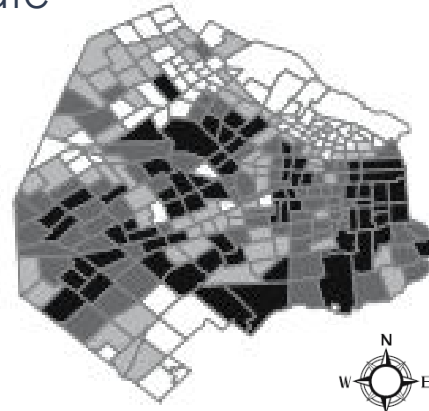
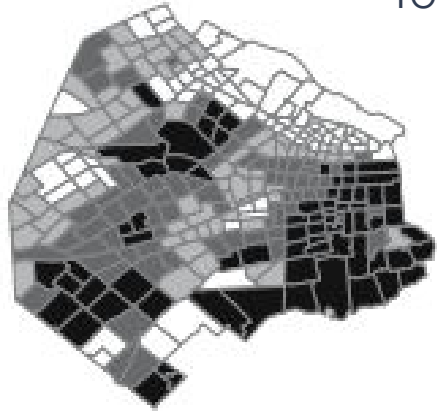


Background

Male

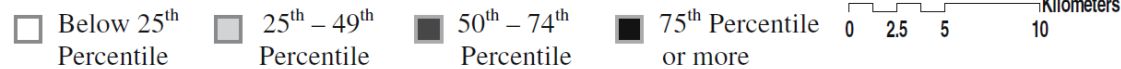
Female

Total death rate

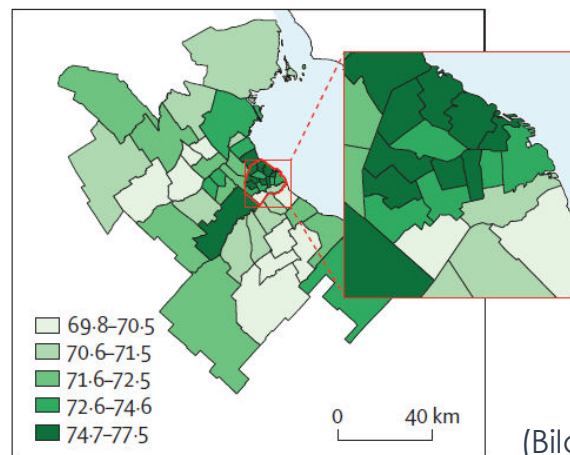


(Diez Roux. et. al, 2007)

Legend for All Quartile Maps:



Buenos Aires



(Bilal U. et. al, 2019)

Gradient of all-cause and cause-specific mortality

Life expectancy at the comuna level in Buenos Aires (P90-P10 difference 4.4 years for men and 5.8 years for women)



It would be valuable to know...

- How much does life expectancy at birth vary across small areas in the city of CABA for the period 2015-2017?
- What is the spatial patterning of life expectancy at birth in CABA?
- To what extent is life expectancy for small areas associated with small area socioeconomic characteristics ?



Population

- Georeferenced data from death registry records for CABA, Argentina
- Source: *Dirección General de Estadística y Censos, CABA*
- Period: 2015-2017
- Small area data-level socioeconomic characteristics from the 2010 census
 - percentage households with water inside dwellings
 - percentage households with overcrowding
 - school attendance among 15-17 years old
 - percentage population aged 20 and above with minimum of high school education
 - percentage unemployment of 14 years and older



Methods and analysis

- Study design: ecological study
- Unit of analysis: 351 *fracciones censales* | small areas
- Deaths were georeferenced to the defined small areas
- Population denominators were obtained by combining data from the 2010 census and population projections from the office for local statistics
- We obtained estimates of age- and sex-specific mortality rates using a spatial Bayesian Poisson model
- The projected age patterns were estimated using linear splines method (TOPALS)



Methods and analysis

- We mapped life expectancy at birth by sex for each small area
- We studied the association between life expectancy and socioeconomic characteristics by fitting simple linear regressions of life expectancy on each standardized socioeconomic variable



Results

Median number of deaths, life expectancy among women and men, and selected socioeconomic characteristics by small area (n=351). CABA, 2015-2017

Variable	Median (10th–90th percentile)	
	Women	Men
Number of deaths	140 (96-191)	110 (74-156)
Estimated Population ^a	13,628 (10,030-18,082)	11,715 (8,530-16,203)
Life expectancy at birth ^a	81.9 (80.3-83.2)	76.7 (74.0-79.3)
Life expectancy at age 20 ^a	62.6 (60.9-63.9)	57.5 (54.7-60.0)
Life expectancy at age 40 ^a	43.0 (41.5-44.3)	38.2 (35.9-40.6)
Life expectancy at age 60 ^a	24.6 (23.4-25.6)	20.5(18.8-22.3)
Percentage of population aged 15 or younger ^a	17.7 (13.1-23.0)	21.7 (17.0-27.0)
Percentage of population aged 65 or older ^a	19.8 (15.7-24.0)	13.2 (10.4-17.1)
Percentage water inside dwelling ^b	99.1 (93.5-99.9)	
Percentage of households with overcrowding ^b	0.69 (0.25-2.9)	
Percentage school attendance among 15-17 years old ^b	99.2 (86.3-96.3)	
Percentage minimum high school education ^b	72.7 (52.7-86.7)	
Percentage unemployment ^b	4.1 (3.1-5.5)	

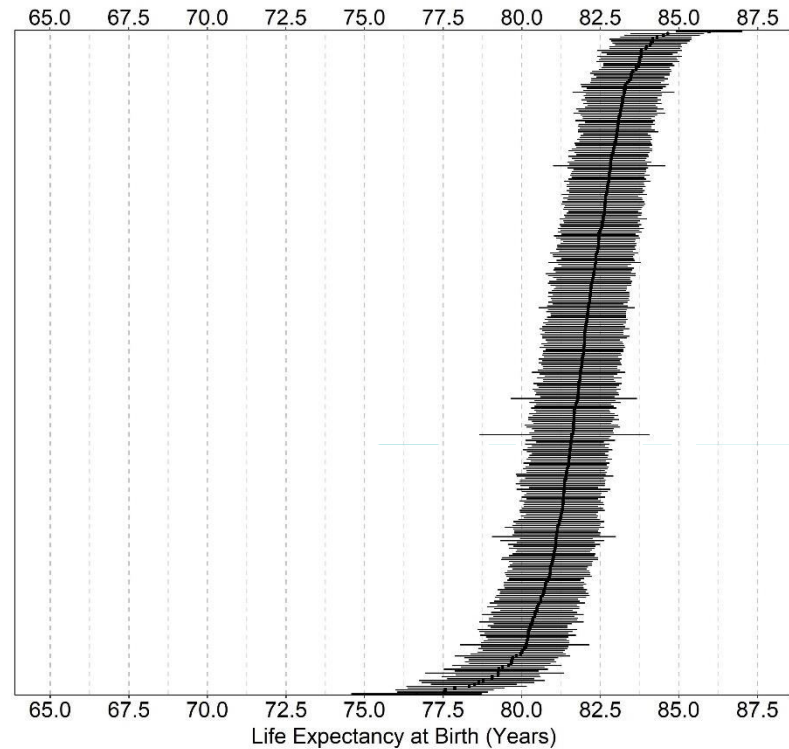
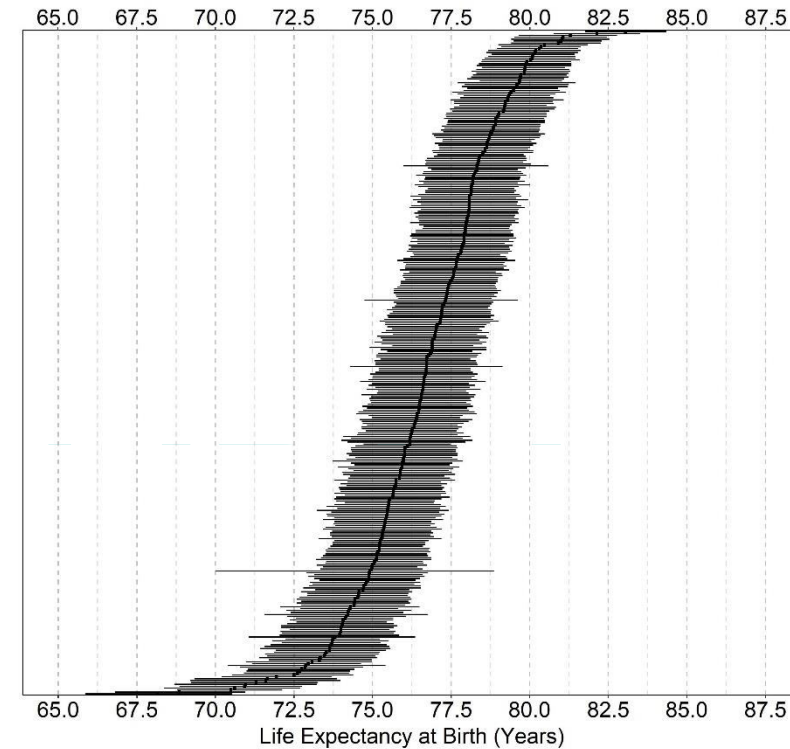
^aData from 2015-2017

^bData from 2010

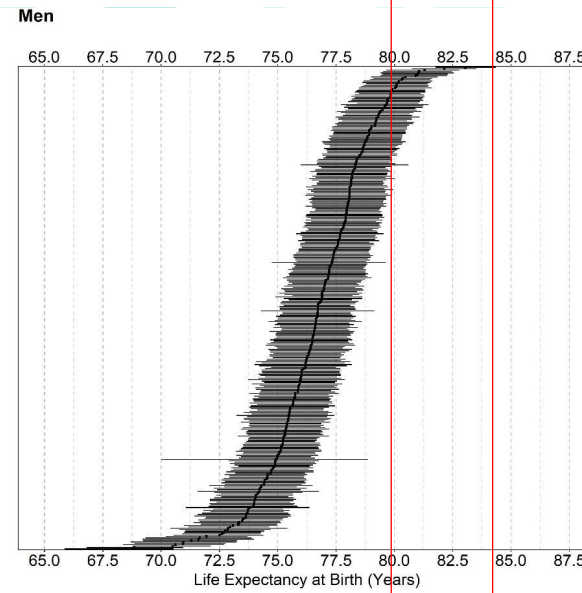
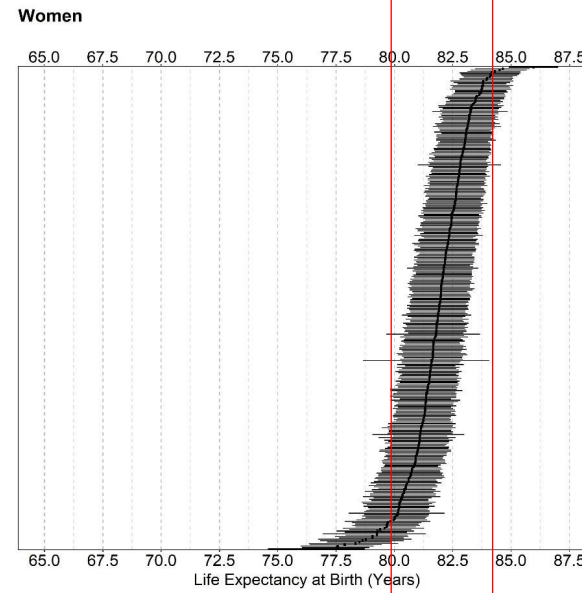
- Overcrowding: proportion of households with more than 3 people per room.
- Unemployment: proportion among the population 15 years or more in labor force.



Life Expectancy at birth (95% CI) among women and men, by *small area* in CABA 2015-2017

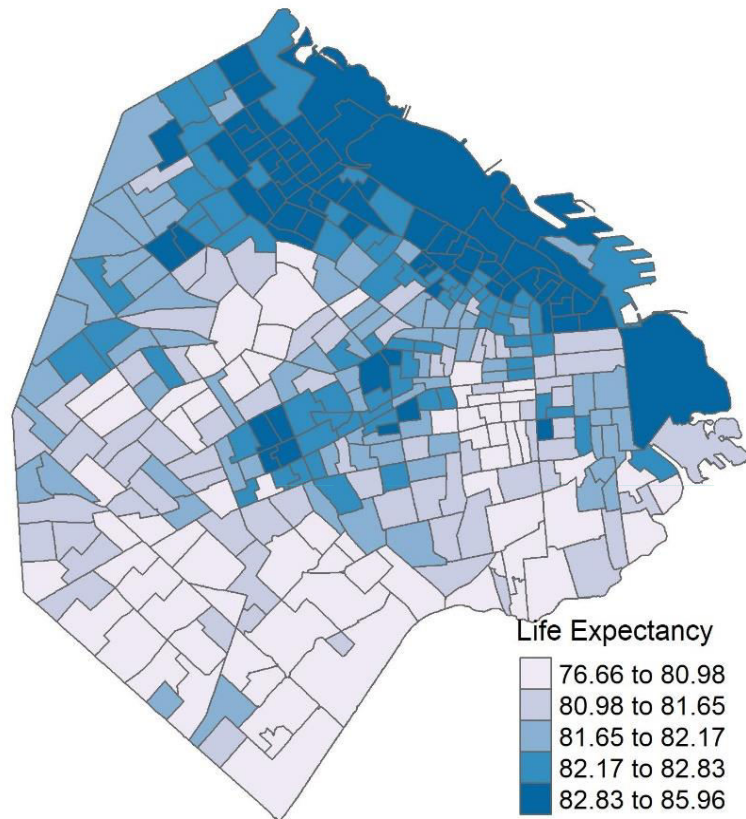
Women**Men**

Life Expectancy at birth (95% CI) among women and men, by *small area* in CABA 2015-2017

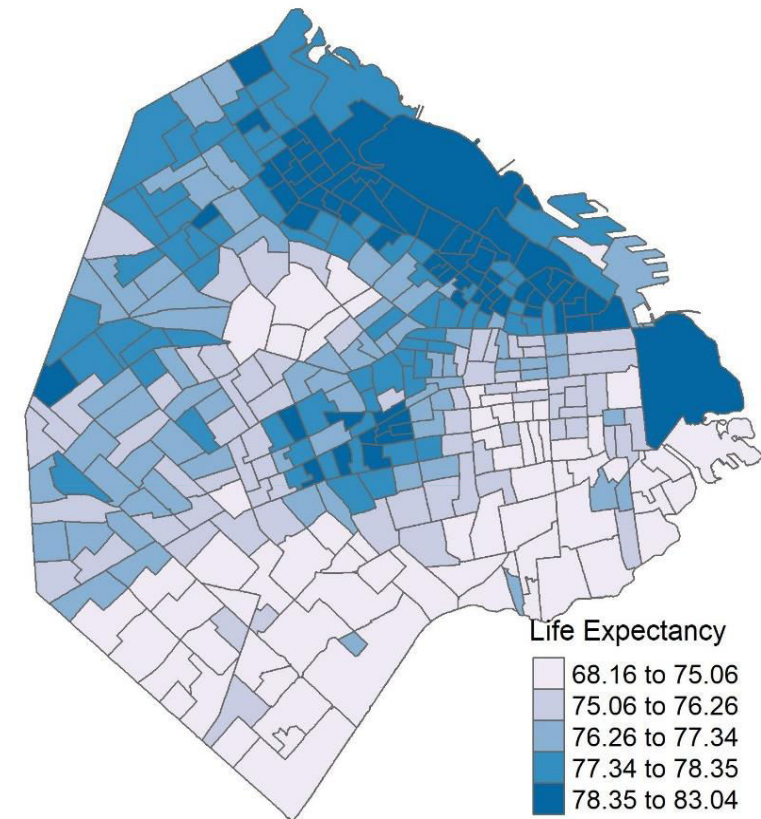


Maps of Life Expectancy at birth among women and men by small area. CABA, 2015-2017

Women



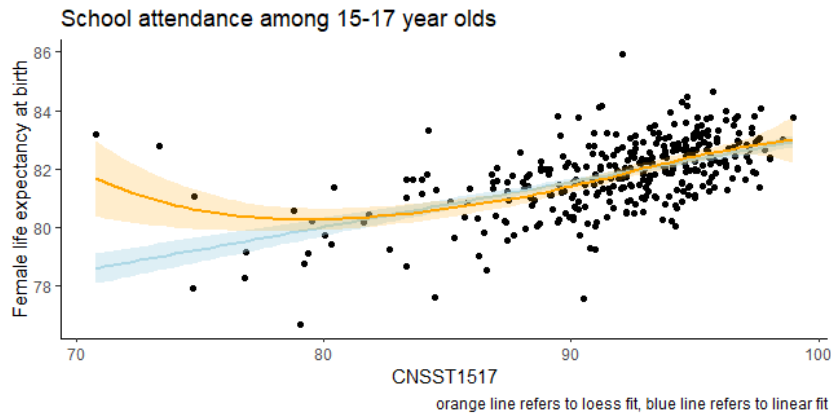
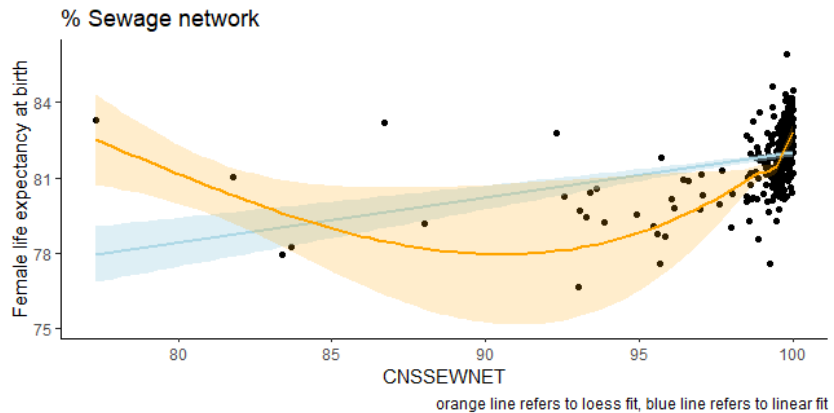
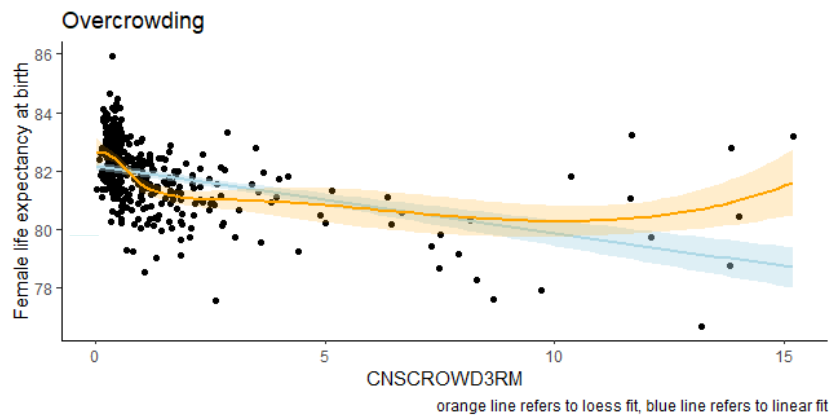
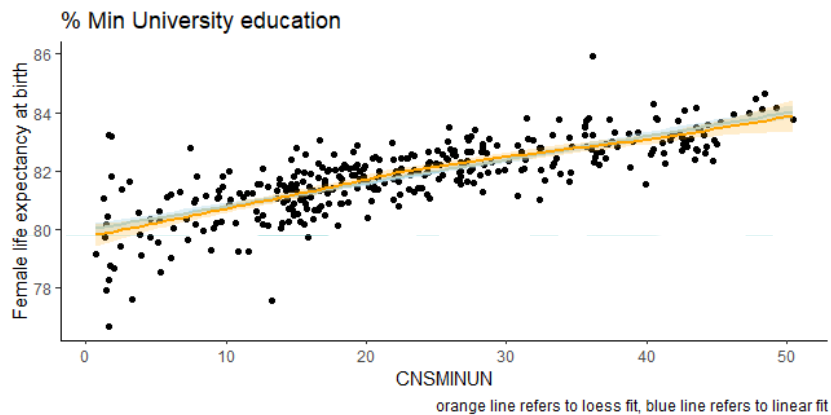
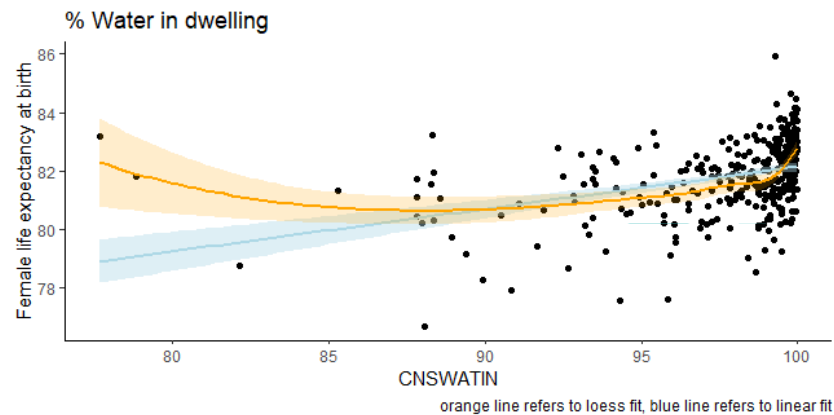
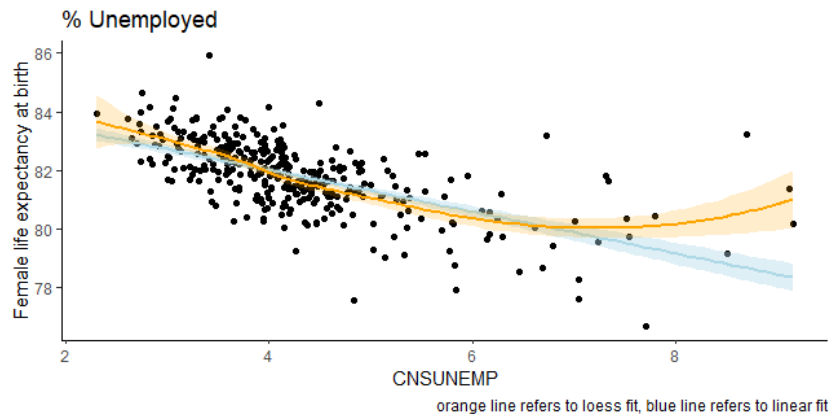
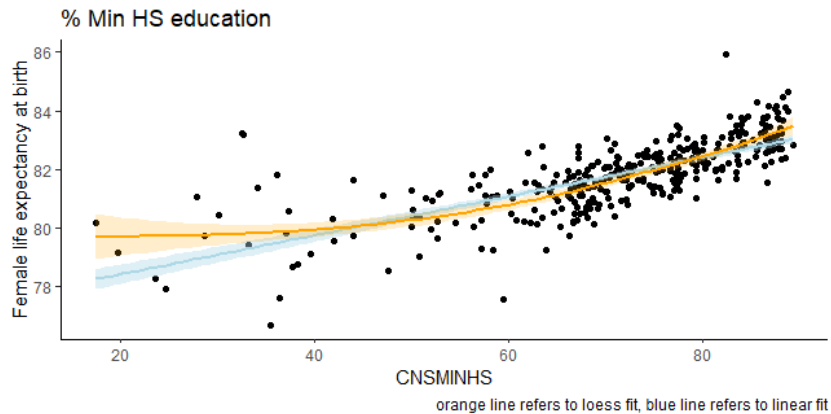
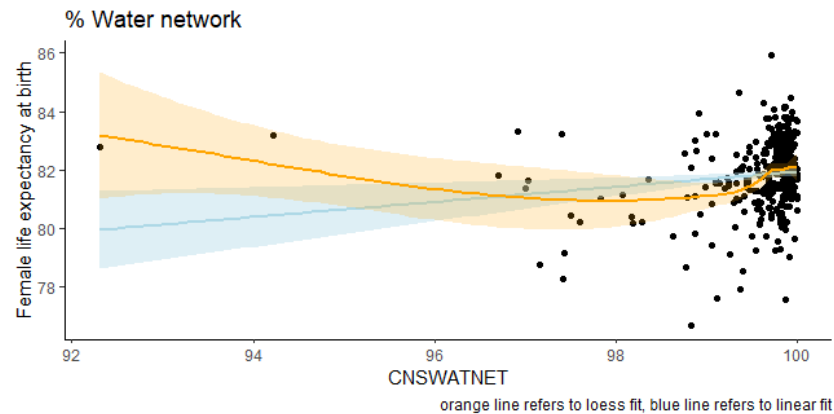
Men



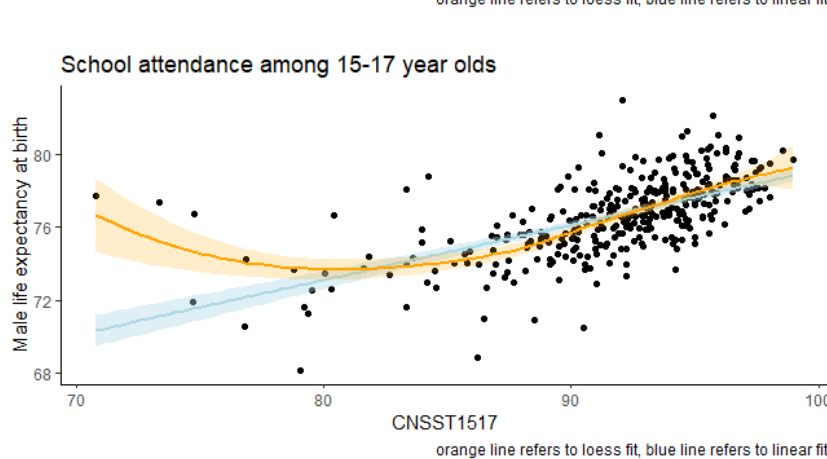
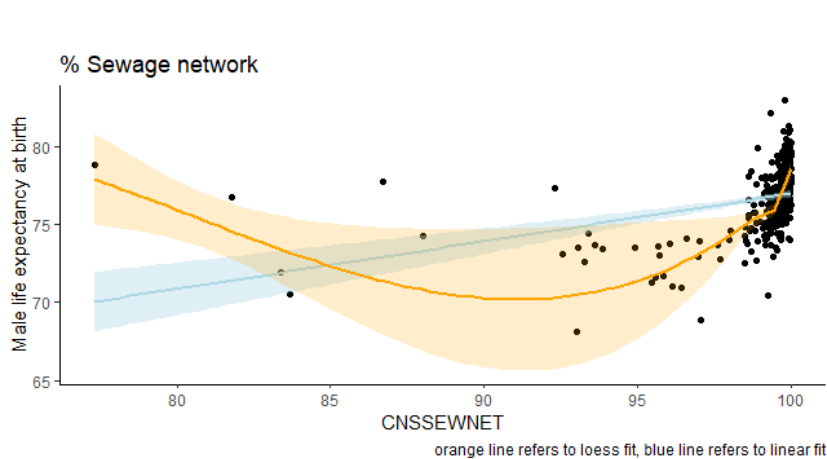
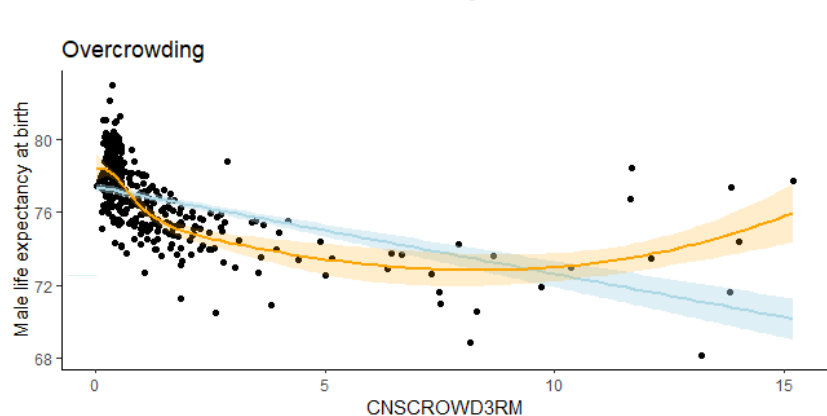
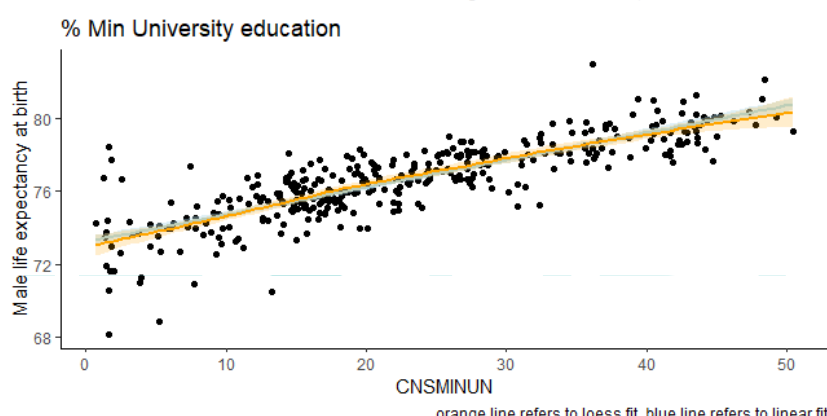
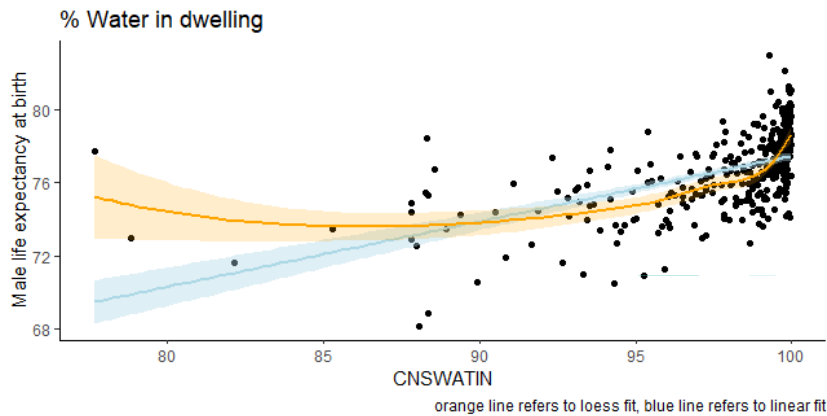
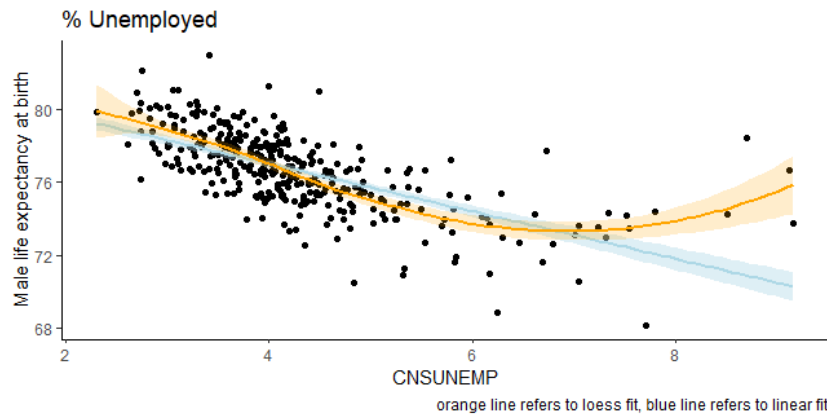
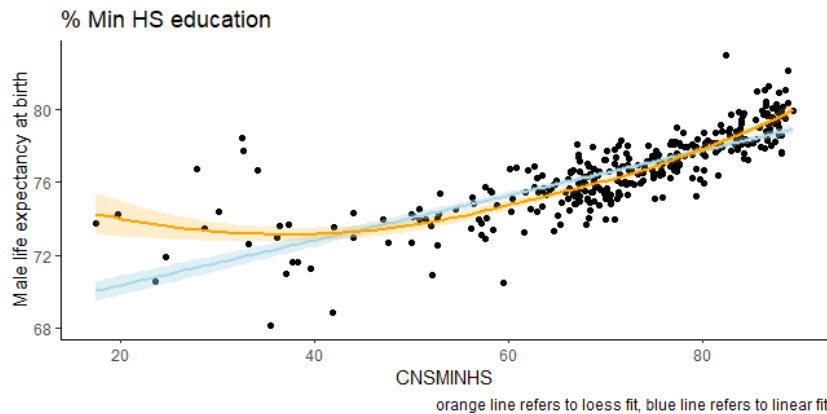
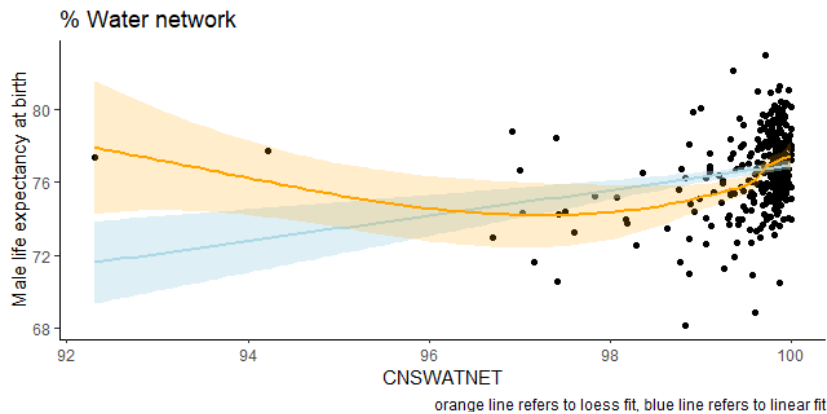
Source: SALURBAL data



Scatter plot and fit lines of the association between life expectancy at birth and socioeconomic characteristics in each small area, among females. CABA, 2015-2017



Scatter plot and fit lines of the association between life expectancy at birth and socioeconomic characteristics in each small area, among males. CABA, 2015-2017



Discussion

- Overall, LEB differ by gender, being higher for women (81.1 years) than in men (76.7 years)
- The LEB was higher in the northern area of CABA compared to the southern area of the city
- *Women* who live in areas with better indicators live 10 years longer than those living with worse conditions
- While *men* live 15 years longer than those who live in areas with worse indicators
- The LEB showed an expressive association between those households that had a higher percentage of access to piped water and a higher level of schooling



Final remarks

Strengths

- Georeferenced data accuracy was lower than 2% for each year, and less than 7% for records under age 1
- The (TOPALS) model used in this study may be promising as a strategy for dealing with data availability/quality in low- and middle-income countries

Limitations

- Time difference between census variables (2010) and georeferenced deaths (2015-2017)
- Modifiable Areal Unit Problem



¡GRACIAS!
OBRIGADO!
THANK YOU!

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