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The population of centenarians in Brazil: historical estimates from 1900 to 2010

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**How many centenarians are
living in the world?**

Background

According to the **United Nations**, there were:

- 450,000 centenarians in 2015 and
- about 60% are living in high-income countries.

According to the **HMD**, in 2018, there were:

- 2,084 centenarians in Sweden, and
- 70,231 centenarians in Japan.

**What do we know about the
centenarian population
in developing countries?**

Little is known.

**Why is important to know
how many centenarians are
living in developing countries?**

Background

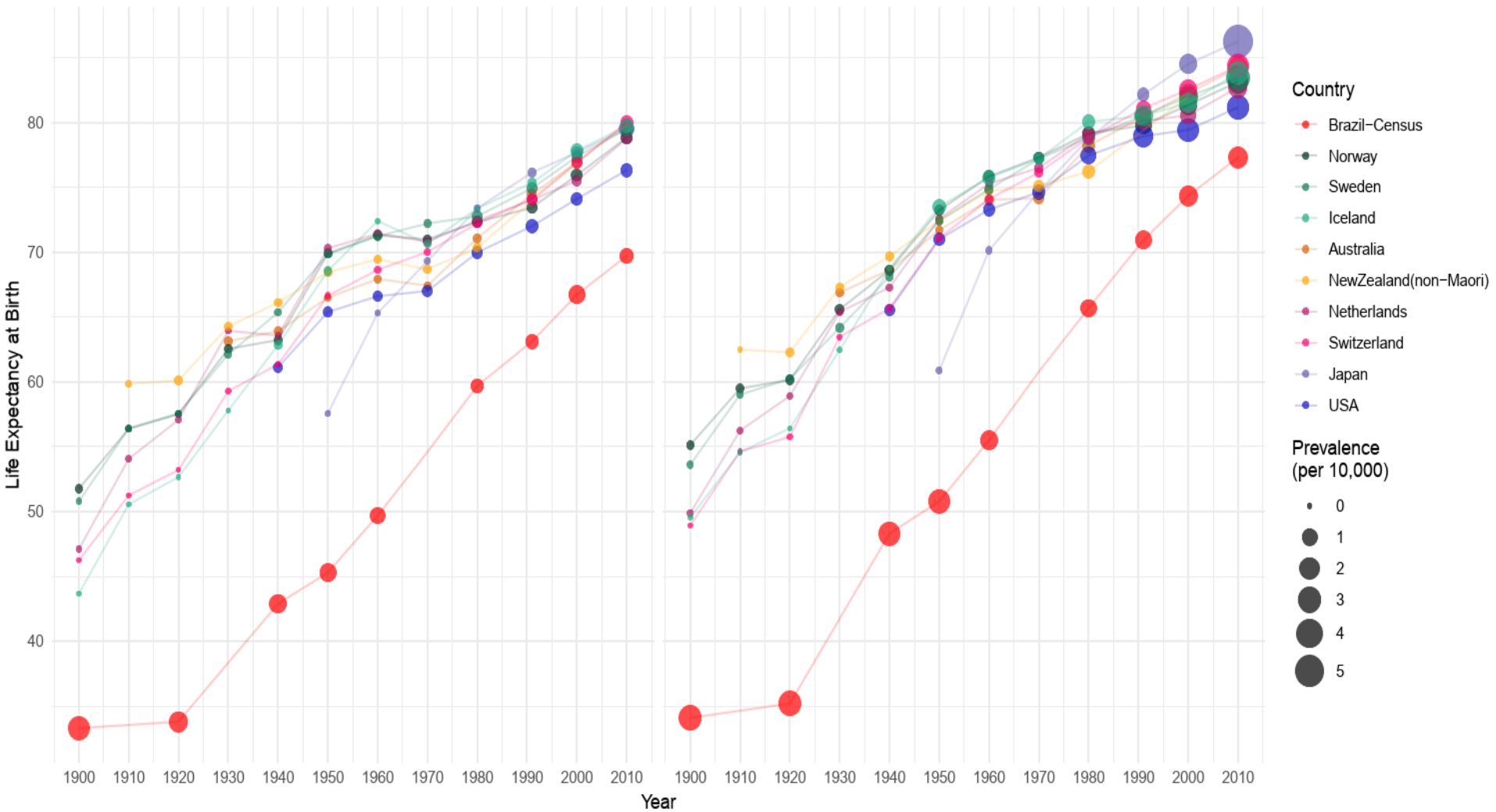
In Brazil, according to the official statistics there were:

- **13,571** centenarians (100+) in 1991
- **24,576** centenarians in 2000
- **24,236** centenarians in 2010

Prevalence of centenarians

Men

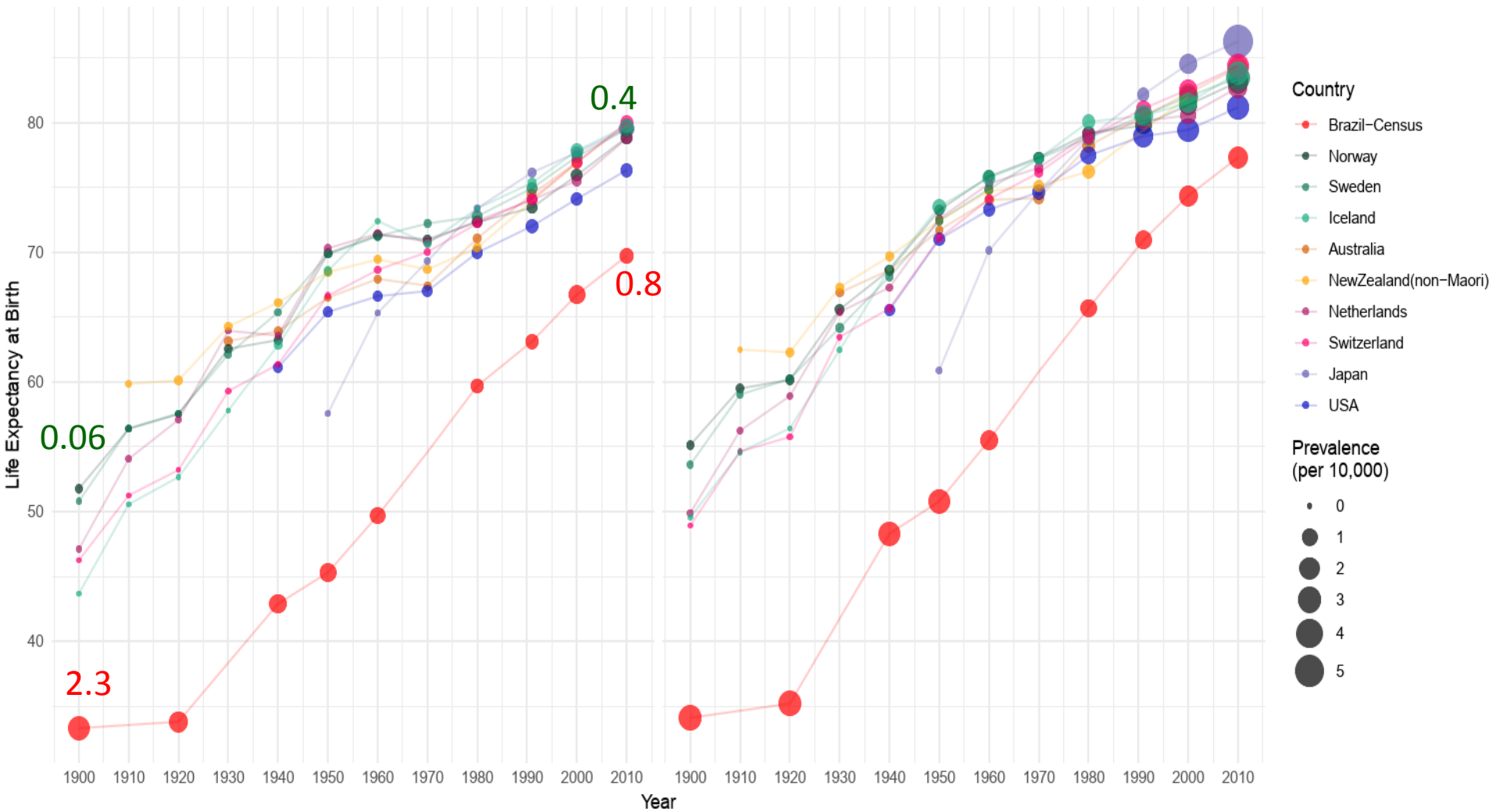
Women



Prevalence of centenarians

Men

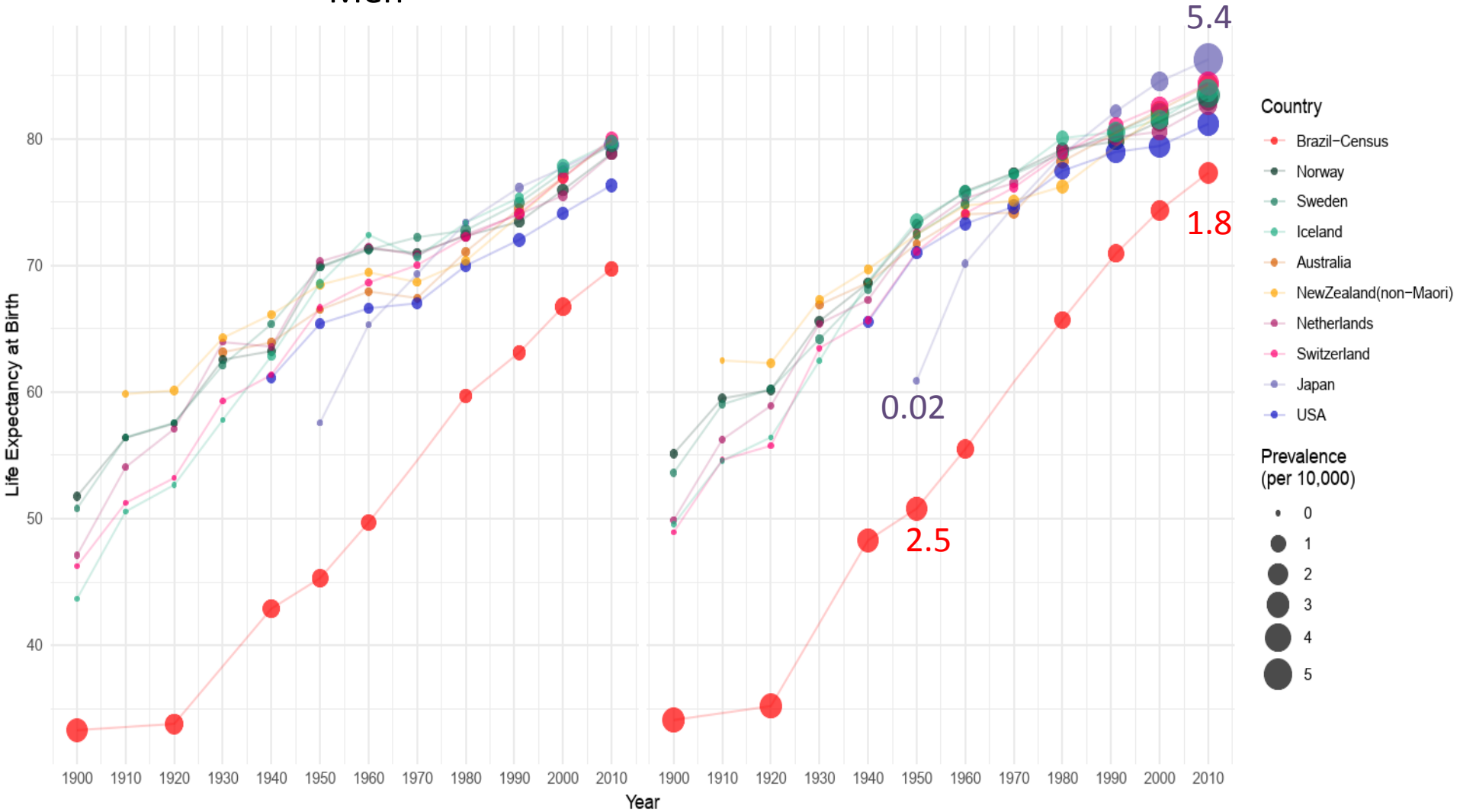
Women



Prevalence of centenarians

Men

Women



What is the size of the centenarian population in Brazil?

Objective

Estimate the number of individuals aged 100 or more between 1900 and 2010 in Brazil.

The variable- r method

(Horiuchi and Preston 1988)

$${}_5N_x(t) = {}_5N_y(t)e^{-\sum_{a=y}^x {}_5r_a} {}_{x-y}P_y$$

$$y = 50, 55, 60, 65$$

$$x = 100, 105, 110, 115$$

The variable- r method

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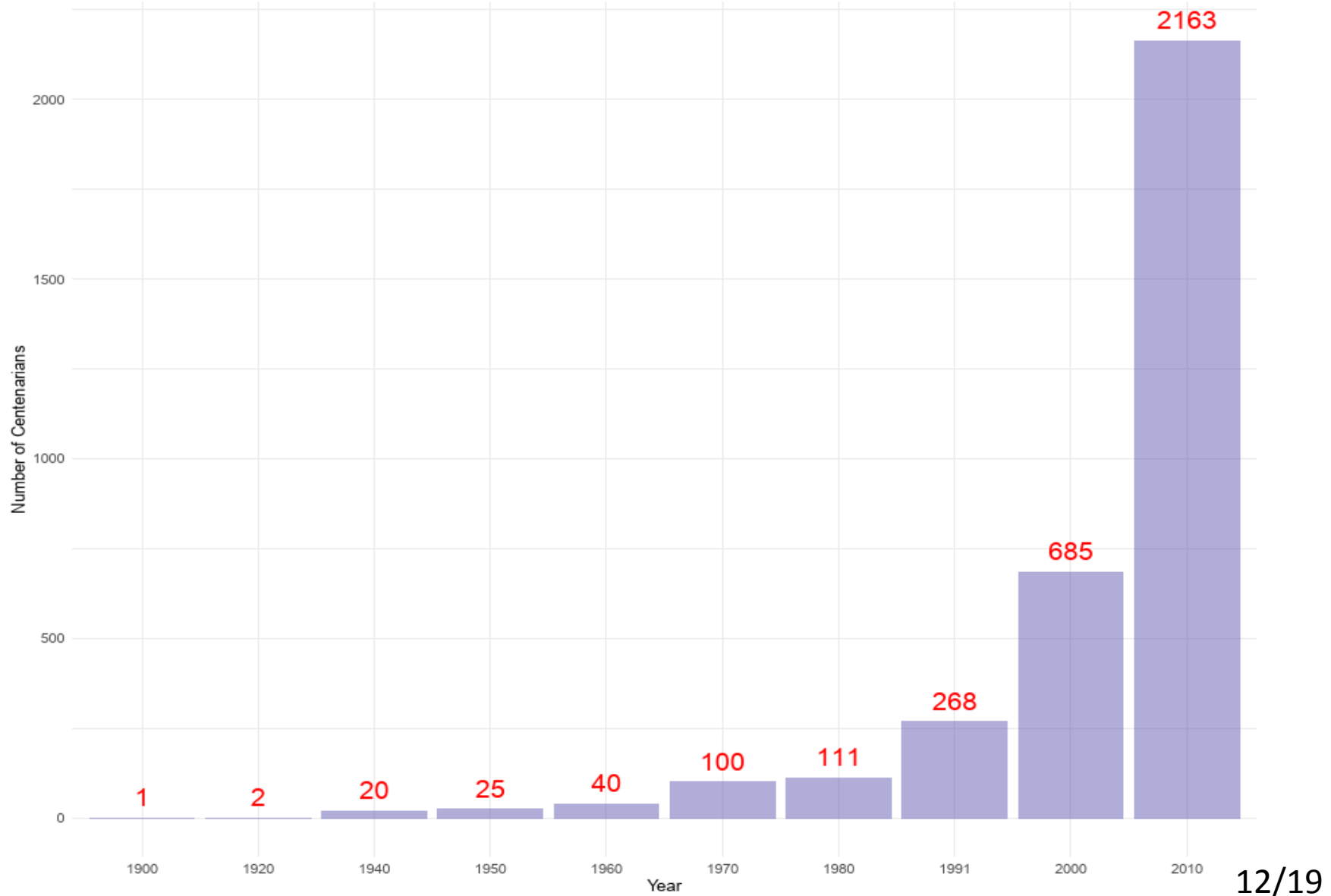
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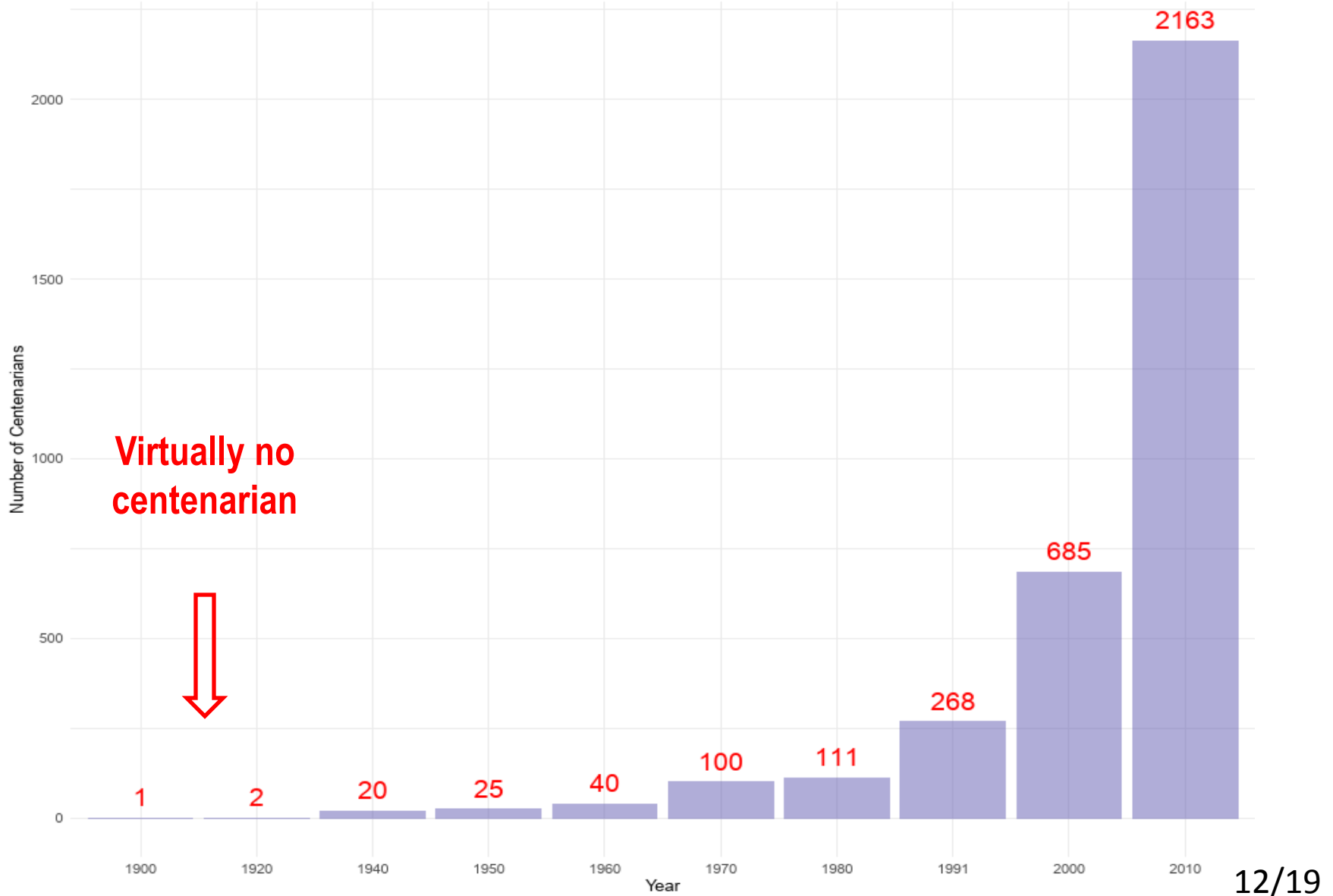
Conditional probability of surviving

- Coale and Demeny Life Tables for the period 1900 to 2010 (e_0 and e_{50}).
- Three mortality models: Kannisto, Weibull and Gompertz for 2000 and 2010 (using Brazilian mortality rates 60-80+).

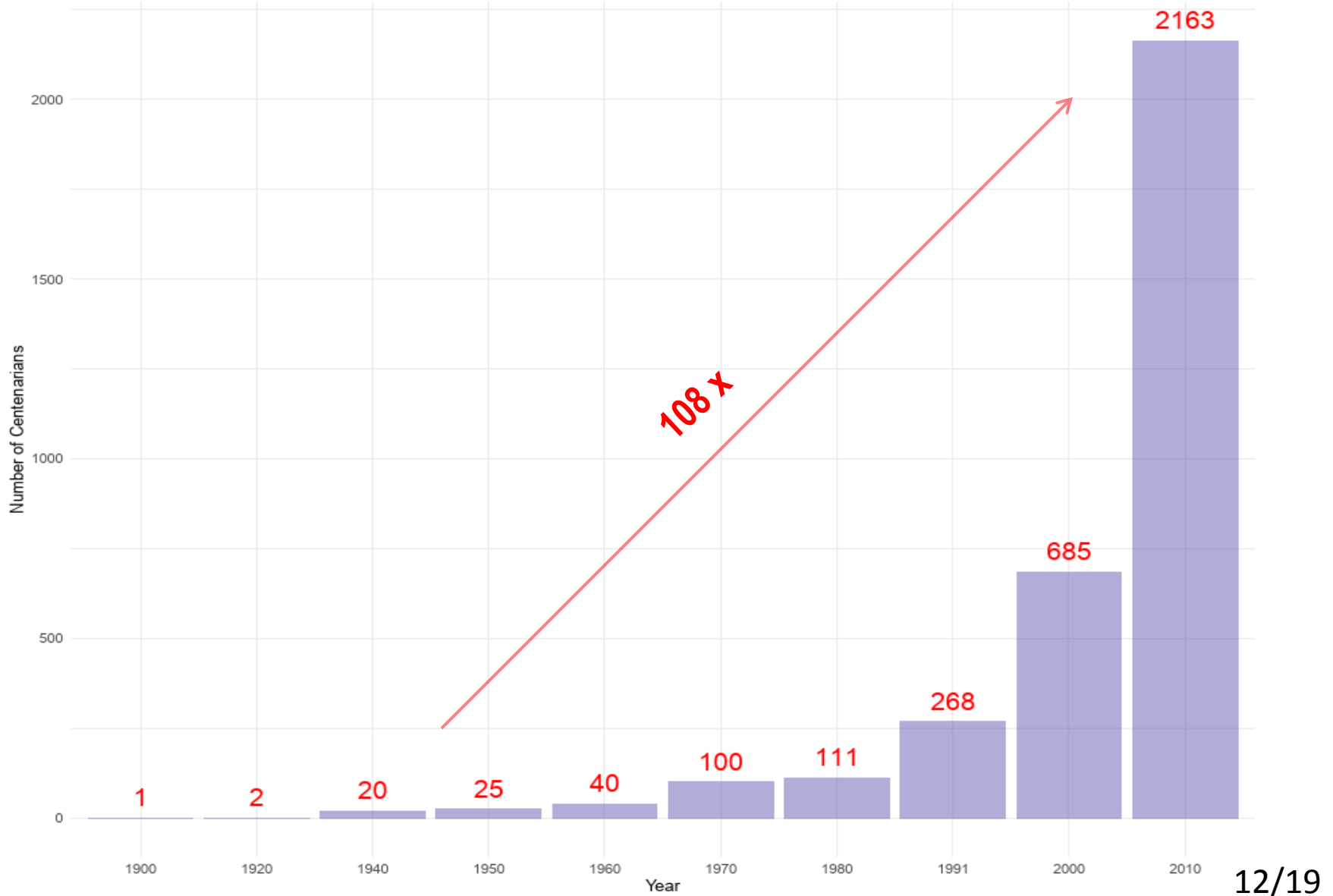
Estimated number of centenarians in Brazil



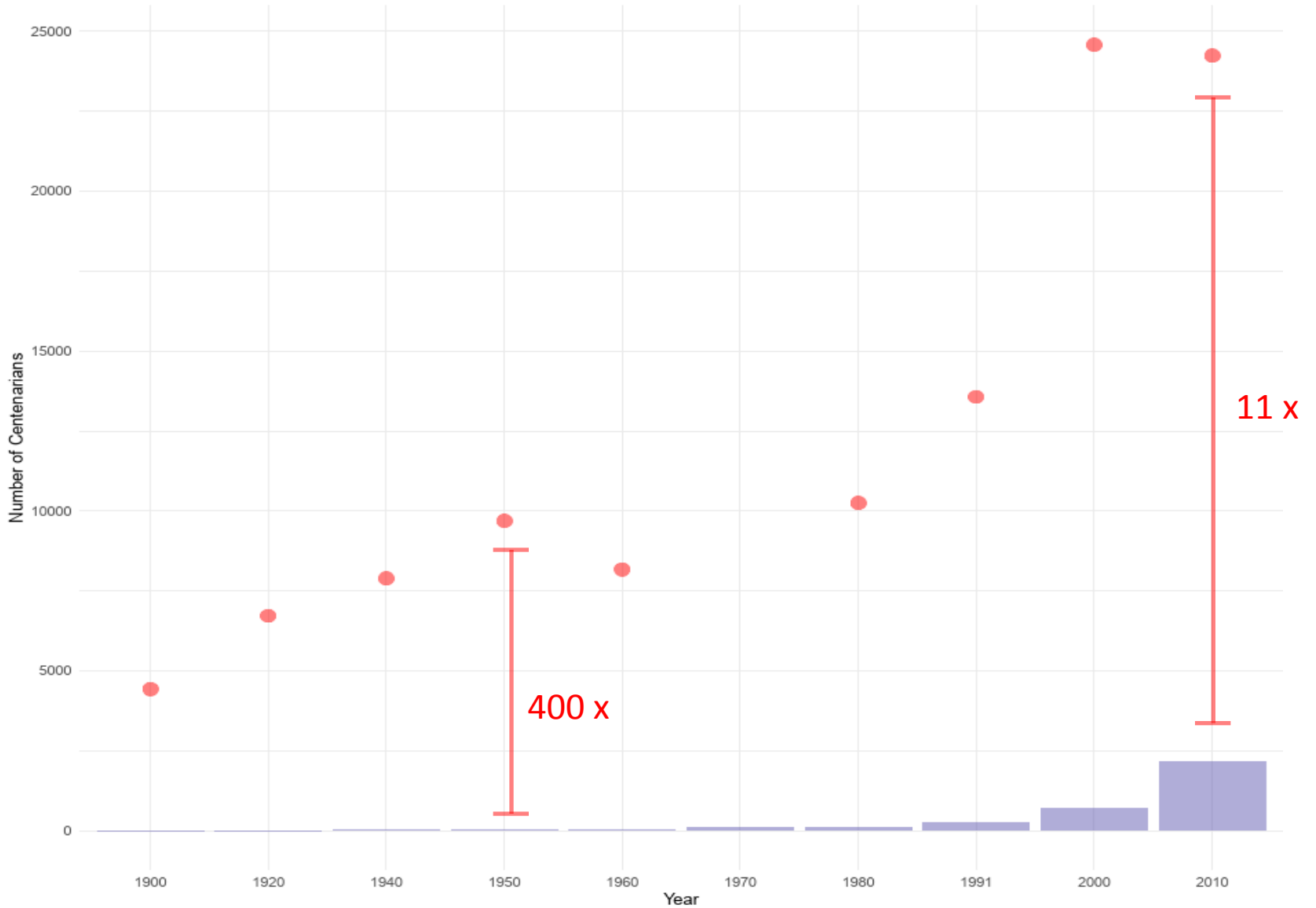
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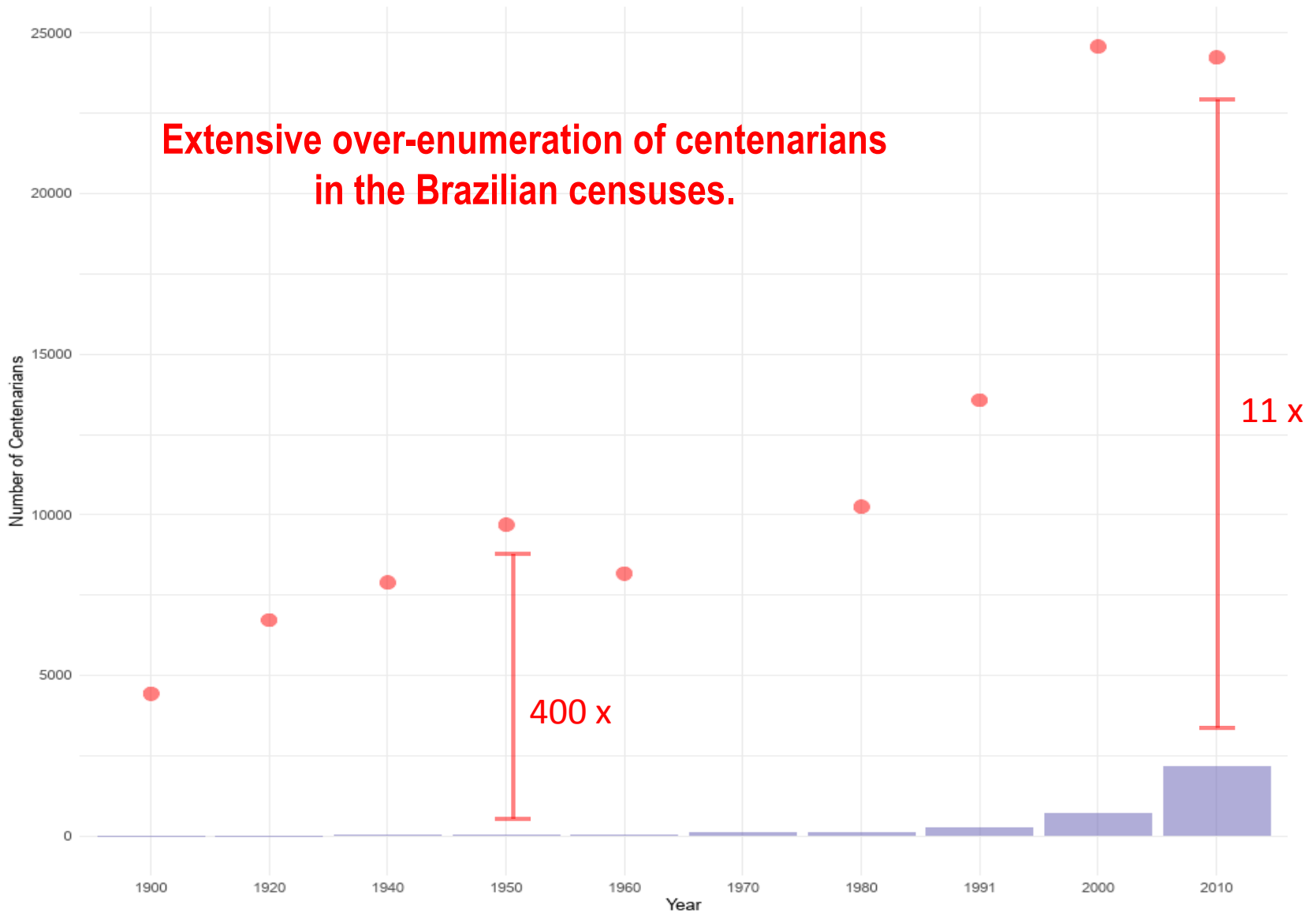
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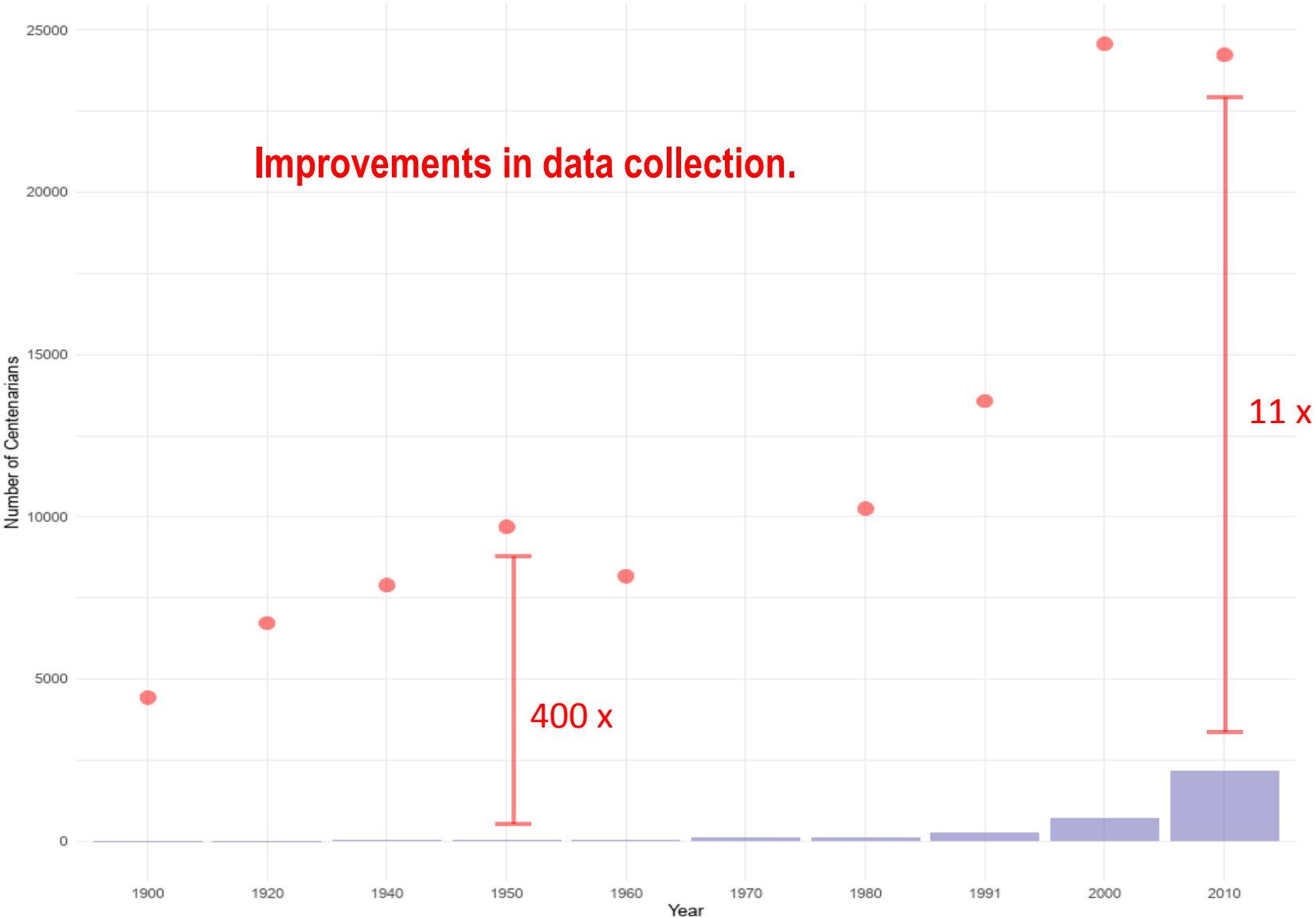
Number of Centenarians Estimated *Versus* Census



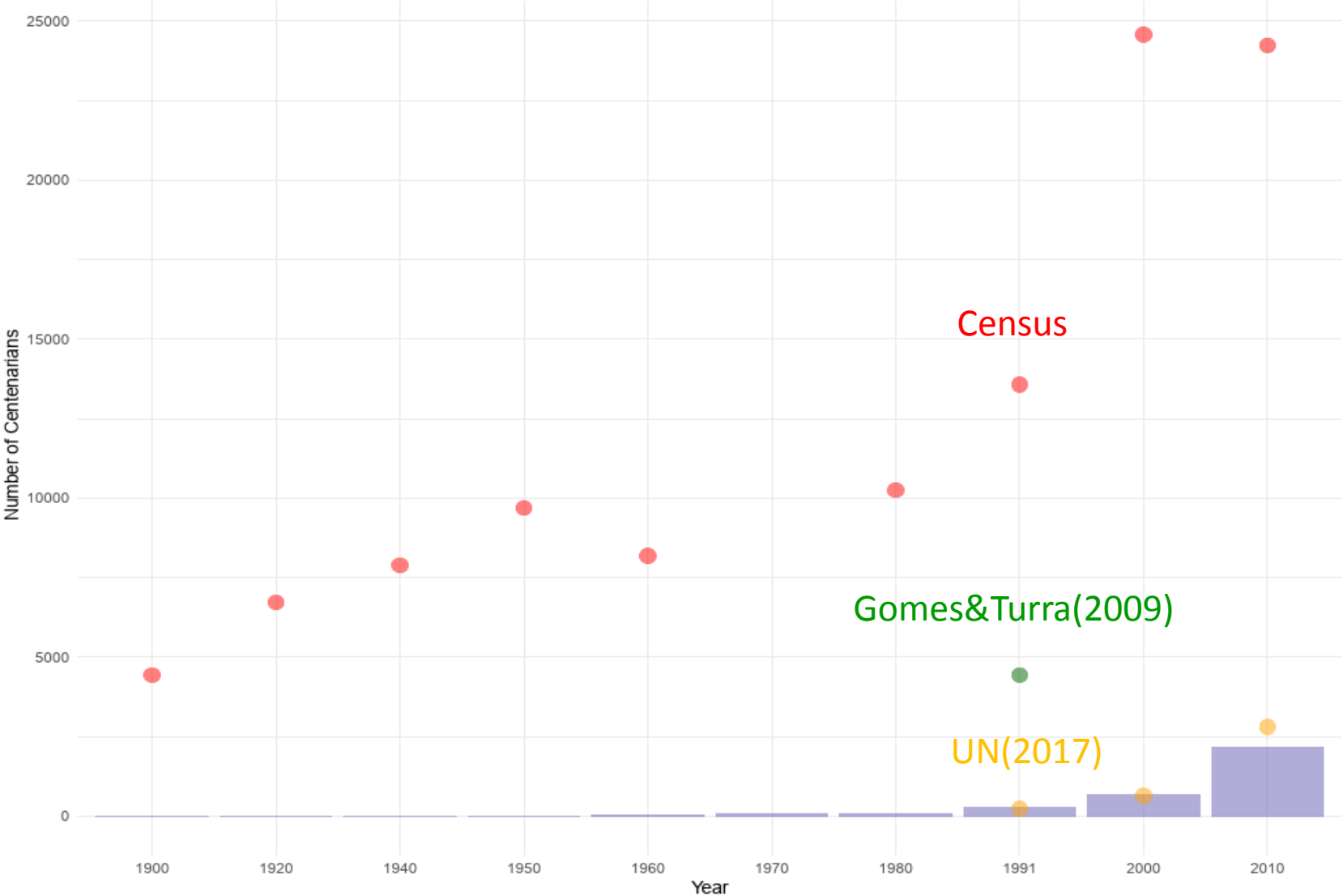
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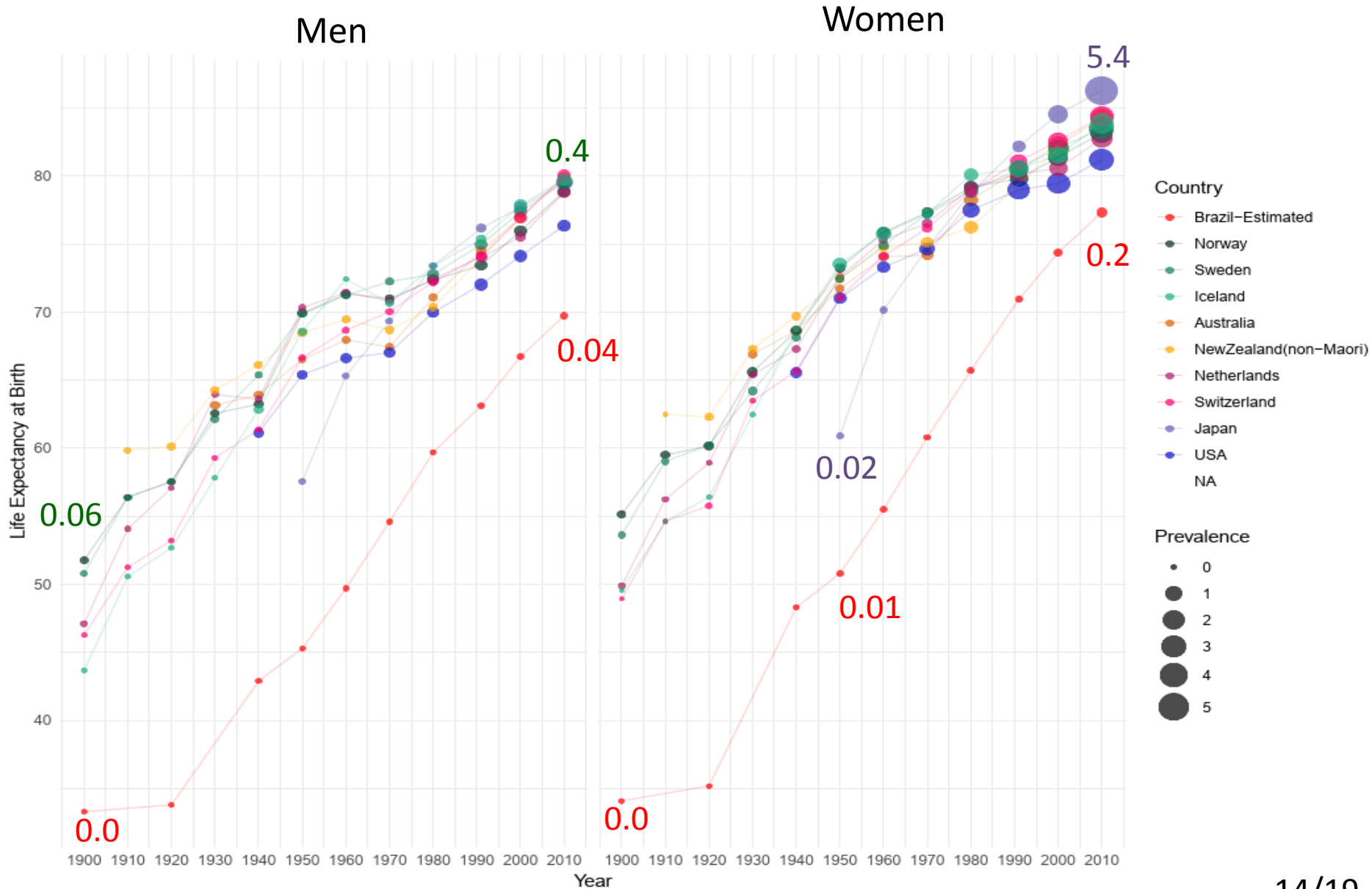
Number of Centenarians Estimated *Versus* Census



Number of Centenarians in Brazil



Prevalence of centenarians



**There was virtually no centenarian
in Brazil in the first 2 decades of
the 20th century.**

**Only in 2010 the number of
centenarians surpassed 1,000
individuals.**

**There is an extensive over-
enumeration of centenarians in
the census records.**

Limitations

We had to borrow mortality patterns from other countries.

Age-specific growth rates may vary over time due to changes in census data quality.

What is the true age pattern of mortality at older ages (65+) in Brazil and in LAC?

Thank you!

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