



# Ageing and the impact of Covid-19 on Demographics

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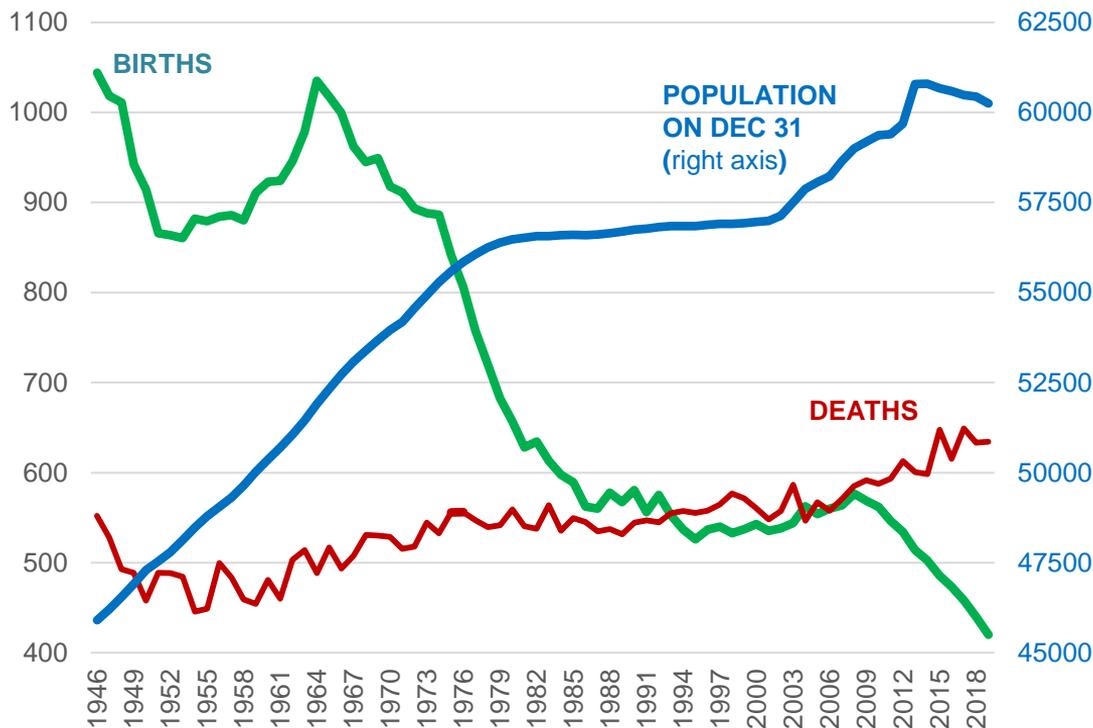
# Italian demography at a glance

	1934	1960	1986	2019
<b>POPULATION</b> (thousands)	42,527	50,025	56,598	60,433
<b>LIFE EXPECTANCY</b> at birth - females	57.4	73.9	78.9	85.3
<b>INFANT MORTALITY</b> in the first year of life (per 1,000)	98.7	43.9	10.2	2.7
<b>FIRST MARRIAGE</b> rate – females (per 1,000)	826.9	1,008.2	666.7	479.8
<b>MEAN AGE</b> at <b>FIRST CHILDBIRTH</b>	-	25.8	26.1	31.2
Total <b>FERTILITY RATE</b>	3.30	2.41	1.37	1.29
Average number of <b>PERSONS IN A HOUSEHOLD</b>	4.2	3.6	2.8	2.3

# Pre-Covid 19 structural transformations: a shrinking population....

## NATURAL POPULATION CHANGE IN ITALY, 1961 – 2019

(Absolute values in '000)



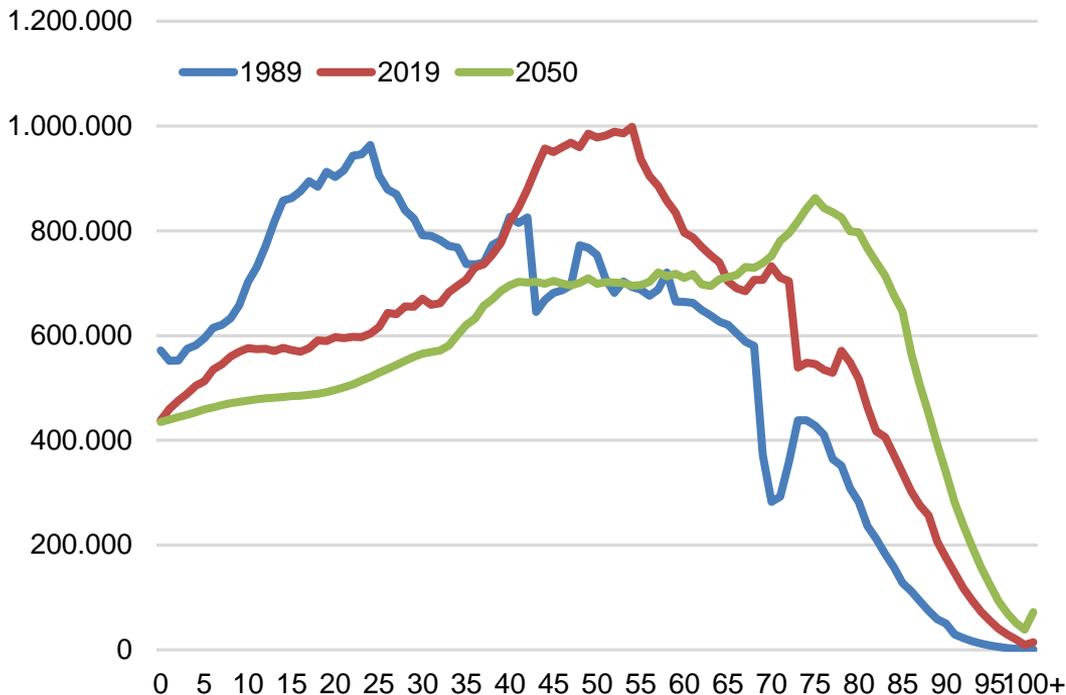
Population: - 551,000 people since Dec 31, 2014

**-214,000**  
Natural population change in 2019

# .... Structural ageing waves started from the 60s' *baby boom* (cohort effect)

## POPULATION BY AGE. YEARS 1989, 2019 AND 2050.

(Absolute values)

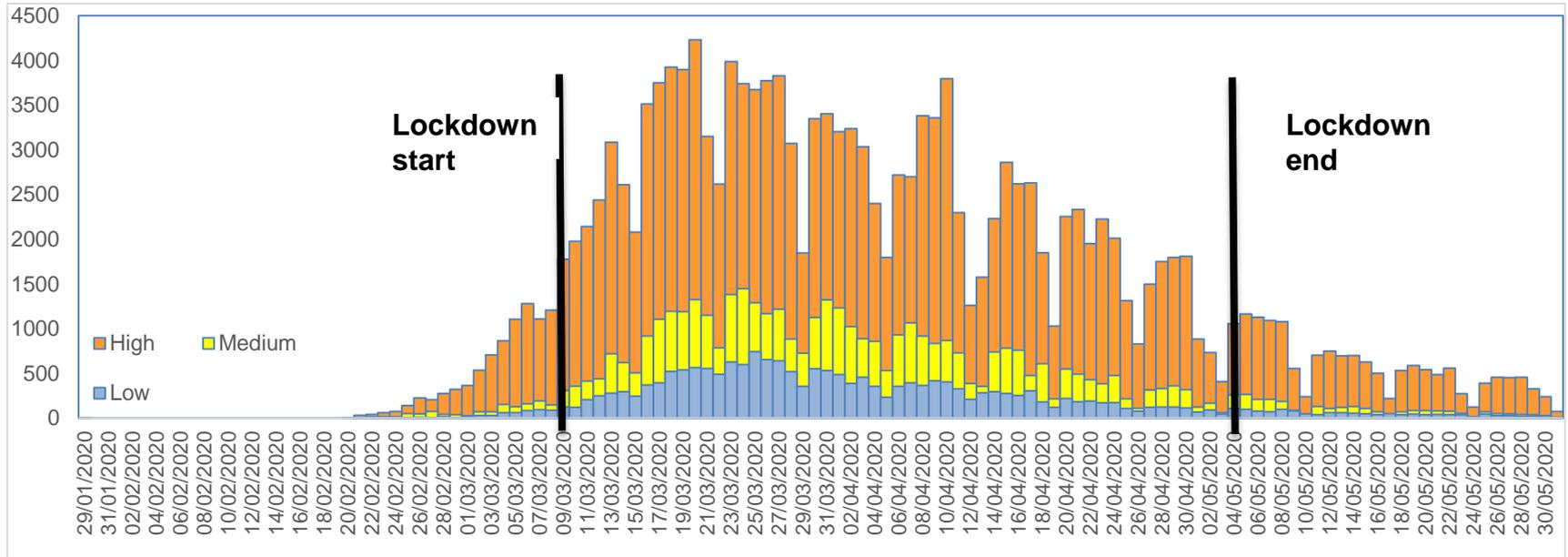


**AGEING** = less **BIRTHS**  
+  
longer **LIVES**  
in addition to  
**COHORT** effects

# The surge of the pandemics: contagion dynamics during the Italian first wave

## DAILY COVID-19 CASES NOTIFIED BY THE NATIONAL SURVEILLANCE AUTHORITY BY AREA OF CONTAGION INTENSITY

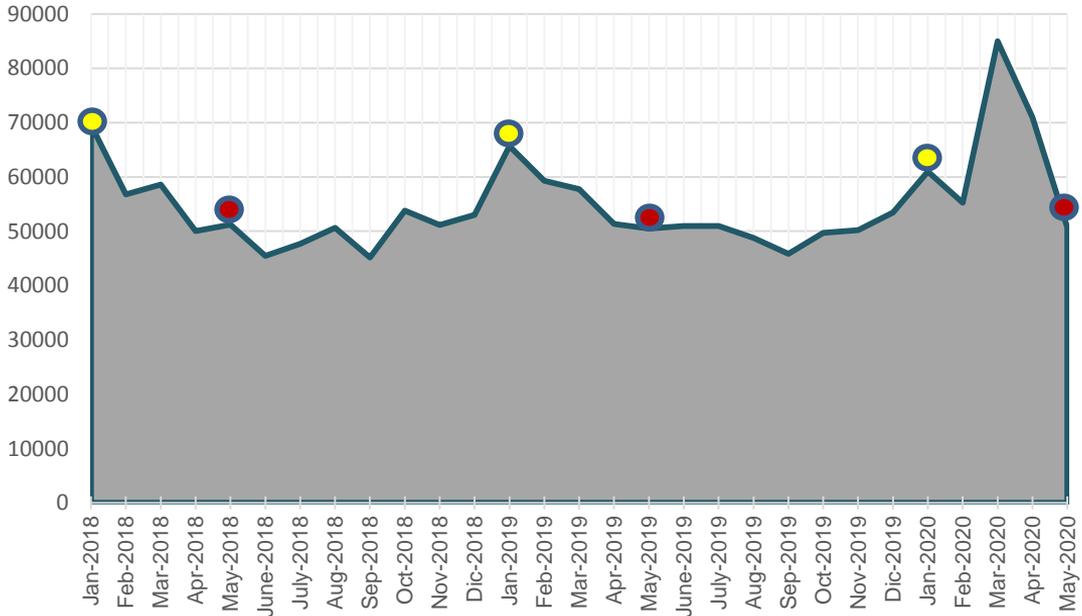
(Absolute values)



**Note:** Low: < 60 cases per 100 thousand residents;  
Medium: >=60 and <= 150 cases per 100 thousand residents;  
High: > 150 cases per 100 thousand residents

# Impact on mortality: if the spike is visible at the national level....

**MONTHLY DEATHS IN ITALY. JANUARY 2018-MAY 2020.**  
(Absolute values)

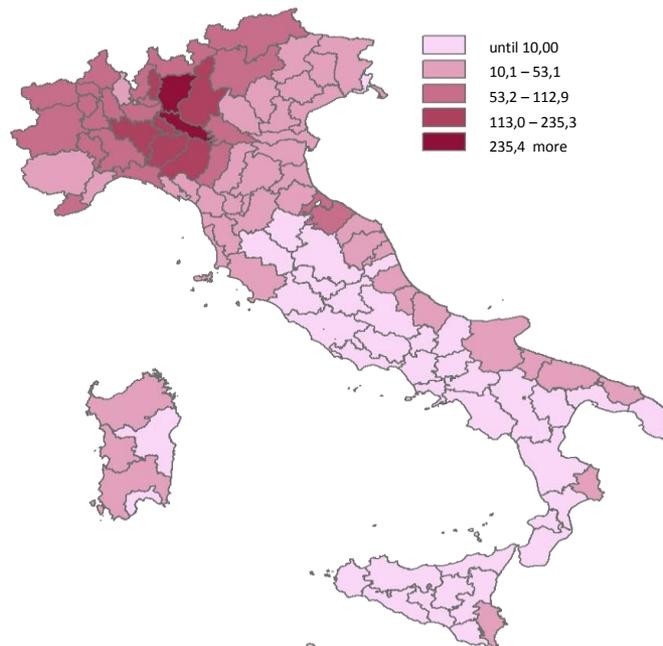


- In 2019, deaths amounted to 634,000 people, only 1,300 units higher than 2018.
- About 26.5% of all deaths in 2019 occurred between February and April: in line with the average 2015-18.
- January always shows a relative pike in mortality; however in January 2020 this spike appears relatively lower.

# Impact on mortality: ... the actual catastrophe emerges MAINLY at the local level

## MORTALITY INCREASE IN THE ITALIAN PROVINCES DURING THE PIKE OF THE PANDEMIC. MARCH-APRIL 2020.

(% variation w.r. to average 2015-19)



At the local level, highest increases affected the following **5 provinces:**

- Bergamo: +364.3%
- Cremona: +292.3%
- Lodi: +235.3%
- Brescia: +222.7%
- Piacenza: +196.7%

- The mortality impact of the pandemics was investigated by means of a simulation model.
- This model assumes 3 possible scenarios on the magnitude of the probability increase of Covid-related deaths, focusing on the highest vulnerable population group in terms of age, i.e. those aged 65 and older.
- Results made it possible to estimate the hypothetical quantitative effects, both in terms of the frequency of deaths, and with respect to changes in life expectancy (at birth and at 65 years of age), as well as with regard to the change in the elderly population, namely aged 65+ and 85+

# Ageing effects of Covid-19: results from a simulation exercise | 2

## BASIC ASSUMPTIONS: 3 DIFFERENT SCENARIOS.

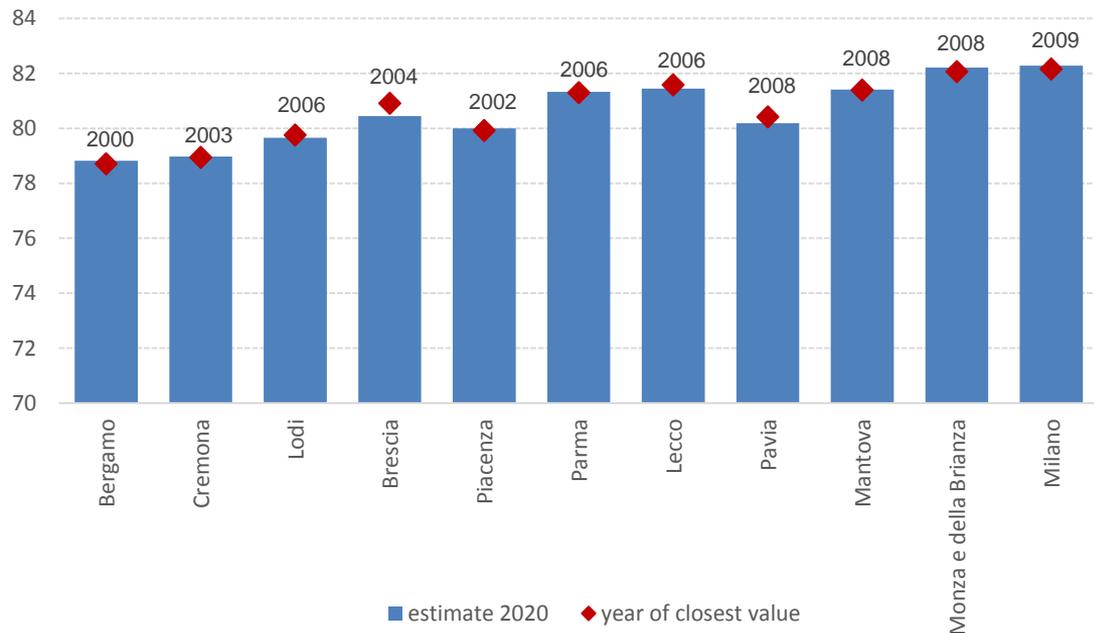
D=average % change in total deaths, March-April 2020 compared to March-April 2015-2019

	I (optimistic) scenario	II (moderate) scenario	III (pessimistics) scenario
January	Normal	Normal	Normal
February	Normal	Normal	Normal
March	100% of D	100% of D	100% of D
April	100% of D	100% of D	100% of D
May	25% of D	25% of D	25% of D
June	Normal	Normal	Normal
July	Normal	Normal	Normal
August	Normal	Normal	Normal
September	Normal	Normal	Normal
October	Normal	12.5% of D	25% of D
November	Normal	25% of D	100% of D
Dicember	normal	50% of D	100% of D

*The value of  $q'_x$  for the 2020 life table is, for every age from 65 onwards, the **arithmetic mean** of the modified  $q_x$  - as increased by the share of D - and the original  $q_x$ : the latter being weighted by the number of “normal” months, and the former being weighted by the number of corresponding months of growth.*

# Survival effects: some local dramatic examples

## LIFE EXPECTANCY AT BIRTH: COMPARISONS IN TIME SERIES



- In Bergamo: estimated life expectancy equivalent to that of the year 2000
- In Cremona: it goes back to 2003

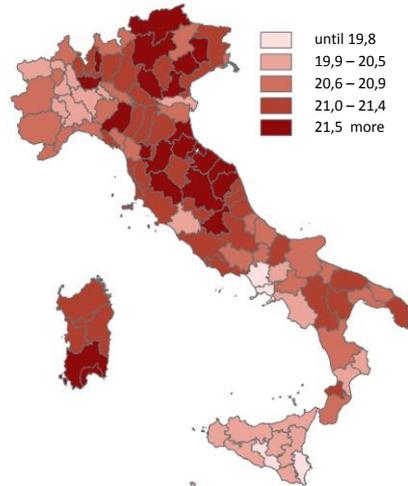
In many other provinces, almost all of them in the North, the return to the past, even if it does not come close to twenty years, still is longer than a decade.

# Ageing effects|1

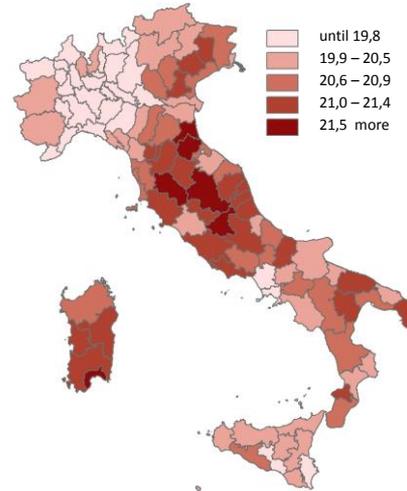
## Life expectancy: *results from a simulation exercise*

### ESTIMATED CHANGE IN LIFE EXPECTANCY AT 65 YEARS OF AGE IN THE ITALIAN PROVINCES.

Year 2018



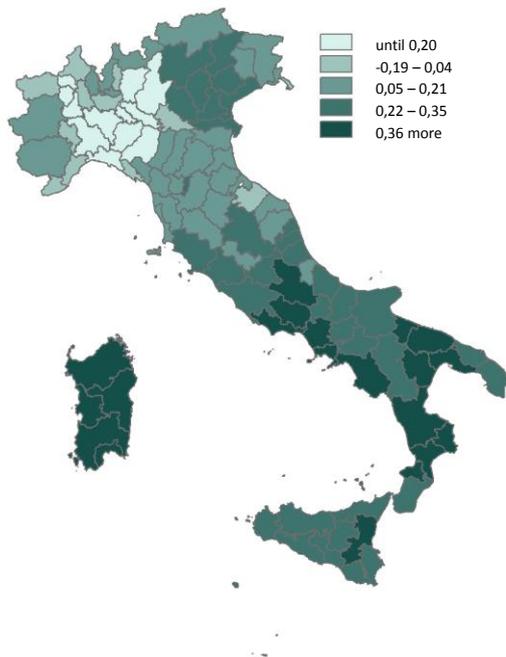
Year 2020: intermediate scenario



In the pre-Covid era, in all the Northern and part of the Central provinces of the country, an individual on his 65th birthday could expect to live, on average, for other 21 years.

According to our exercise, due to the mortality impact of the current pandemics, in many of these areas life expectancy could drop to around 19. However, Southern provinces do not seem to register significant changes (losses)

### CHANGE OF THE OLD AGE INDEX 65+



The growth in the weight of the elderly population (% on total population) in the presence of Covid-19 would reduce by 0.2 percentage points for the whole country (at the national level).

In 19 provinces this percentage is expected to fall.

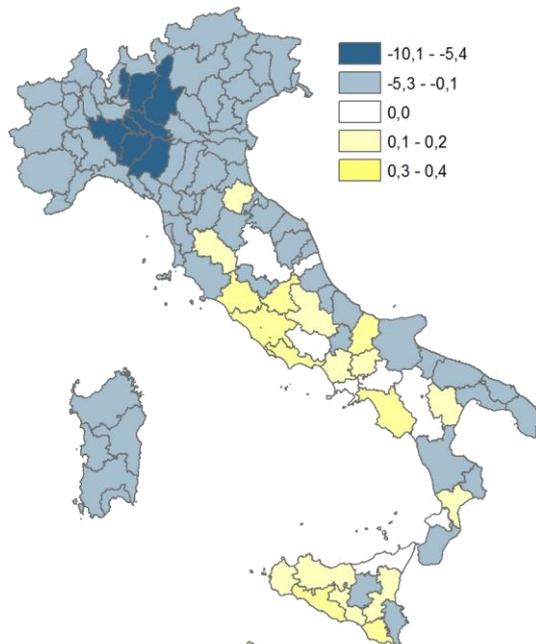
Cremona is the province with the highest negative variation (-0.6 percentage points).

## *Definition*

«A country's «**demographic asset**» of a population, at any given point in time, is the number of years, as a whole, it can expect to survive, taking into account its sex and age distribution as well as its corresponding sex and age life expectancy.

# The impact on the «demographic asset» | 2

## ESTIMATED LOSS IN THE DEMOGRAPHIC ASSETS OF THE ITALIAN PROVINCES IN THE YEAR 2020. MODERATE SCENARIO.



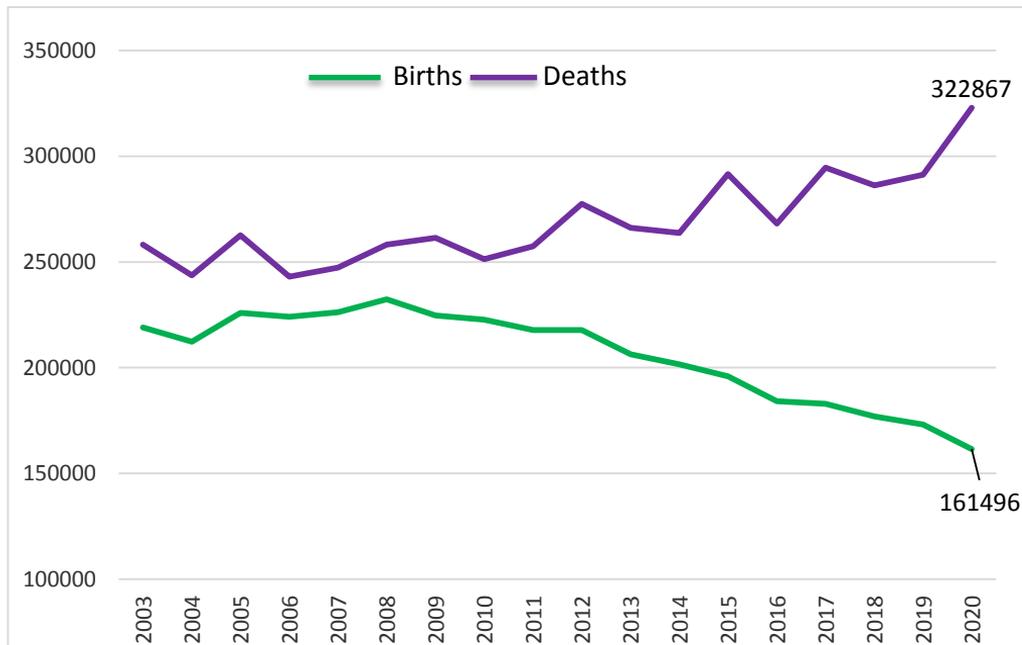
Losses are estimated to be highest in the following 5 provinces:

- Bergamo: -10%
- Cremona: -9,8%
- Lodi: -7,8%
- Piacenza: -7,1%
- Brescia: -7%

# Impact on natality: no significant pandemic effects so far (of course), but the continuation of the uninterrupted regressive trend in births started in 2008

## ITALY - BIRTHS AND DEATHS

(January-May 2003-2020; absolute values)

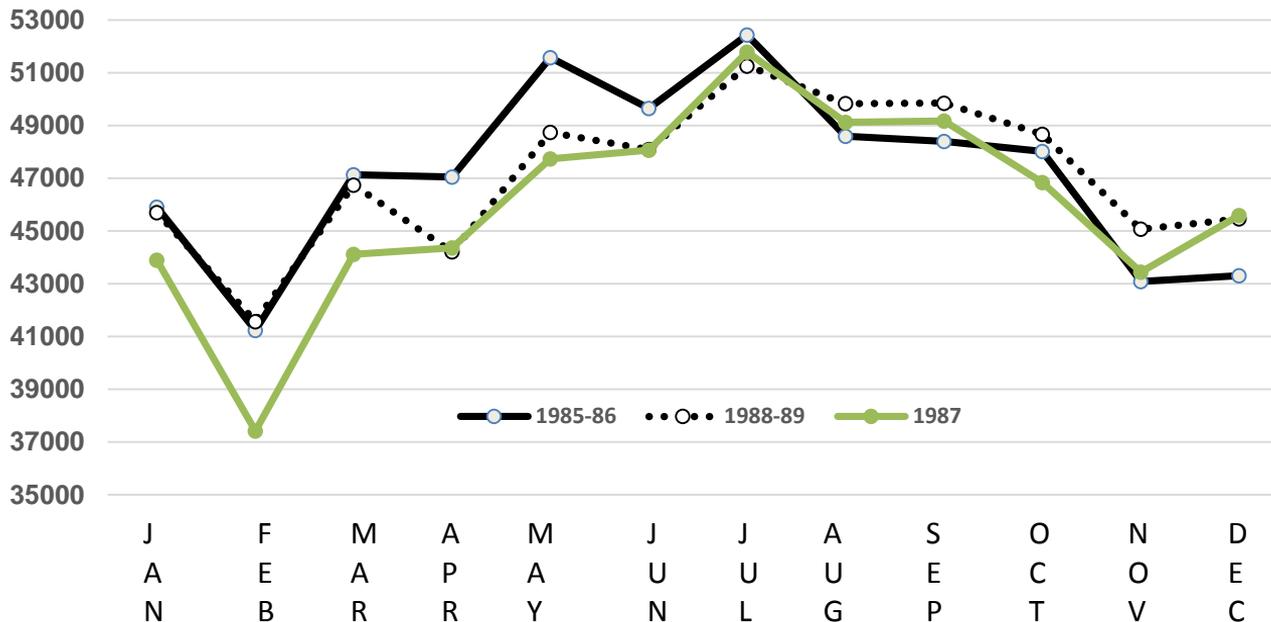


**-2,7%**  
births in Italy  
in the first 5  
months of 2020

# Impact on natality: a lesson from the Chernobyl disaster in the 1980s

## ITALY: MONTHLY BIRTHS IN 1987 AND AVERAGE VALUES FOR THE PERIODS 1985-86 AND 1988-89.

(Absolute values)



Expected fall in 2020 and continuation at the beginning of 2021

THANK YOU FOR YOUR  
ATTENTION!