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BRIDGING SCIENCE & BUSINESS

Genetic trends in gestation length

Katarzyna Stachowicz, Ee Cheng Ooi, Peter Amer

INTERBULL 2023, Lyon, France


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Thank you!

Countries that provided data:

1. Australia
2. Czech Republic
3. Ireland
4. Italy
5. The Netherlands
6. New Zealand
7. Norway
8. Poland
9. Switzerland
10. United States

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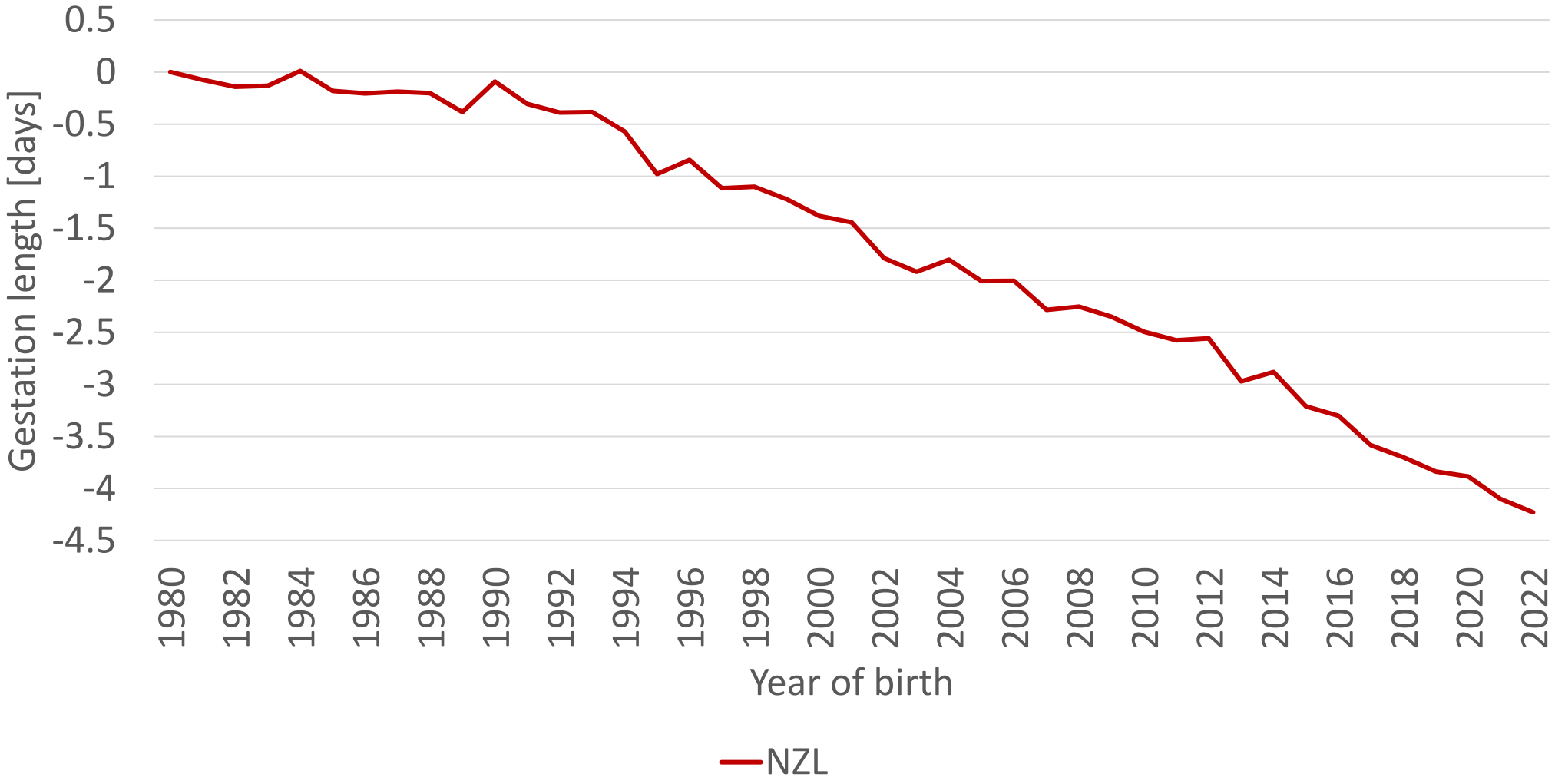
Why?



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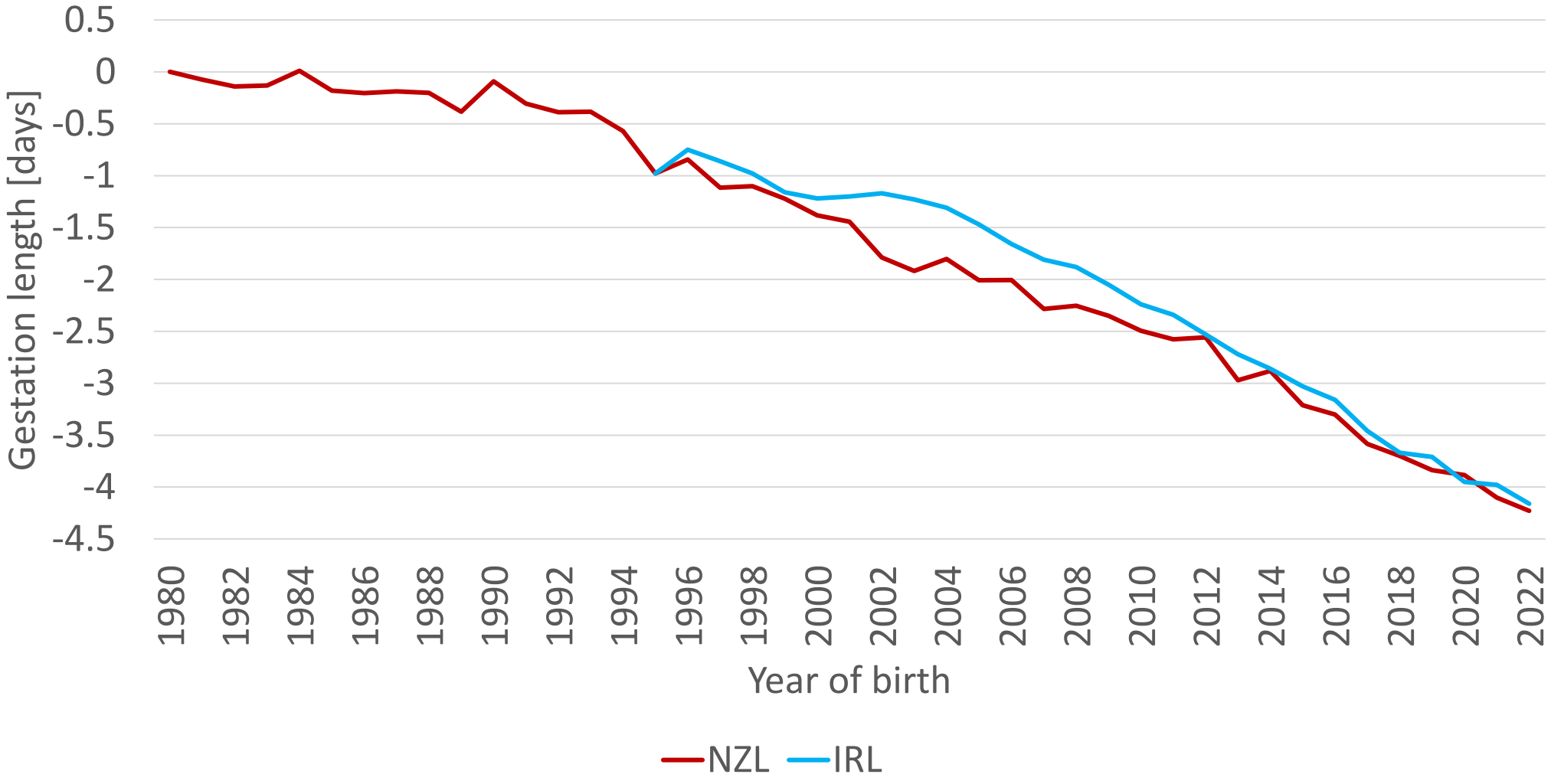

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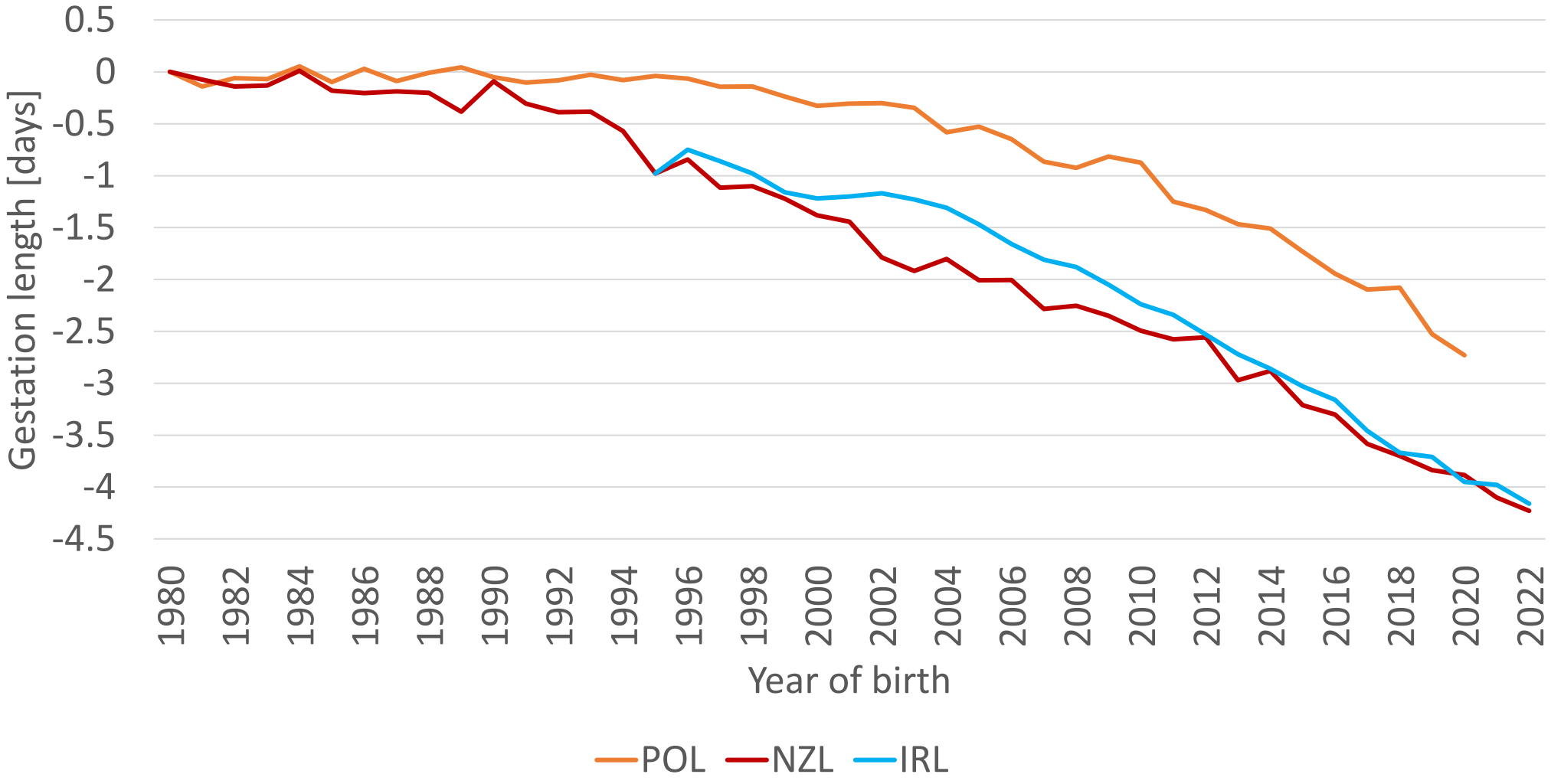

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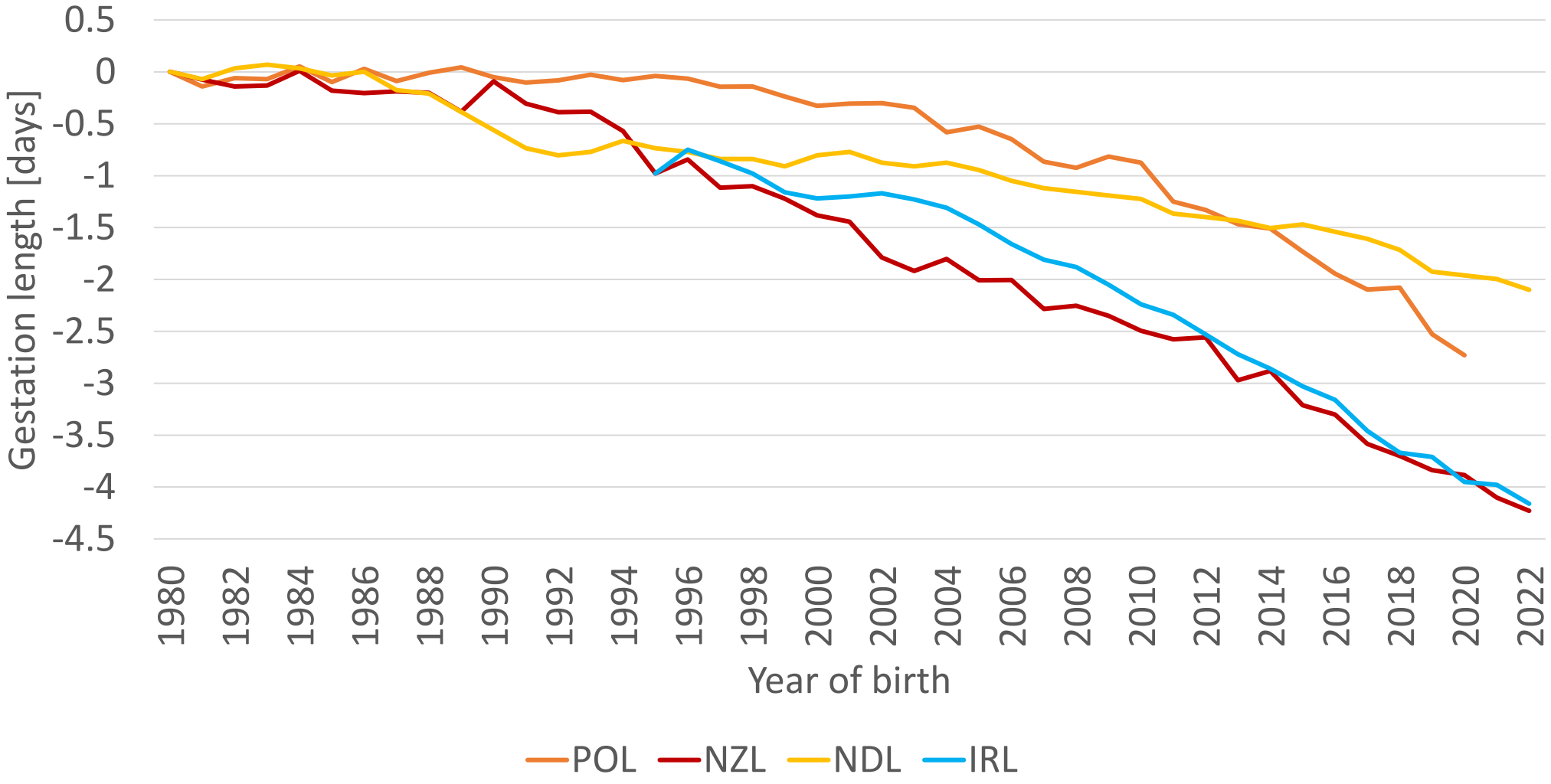

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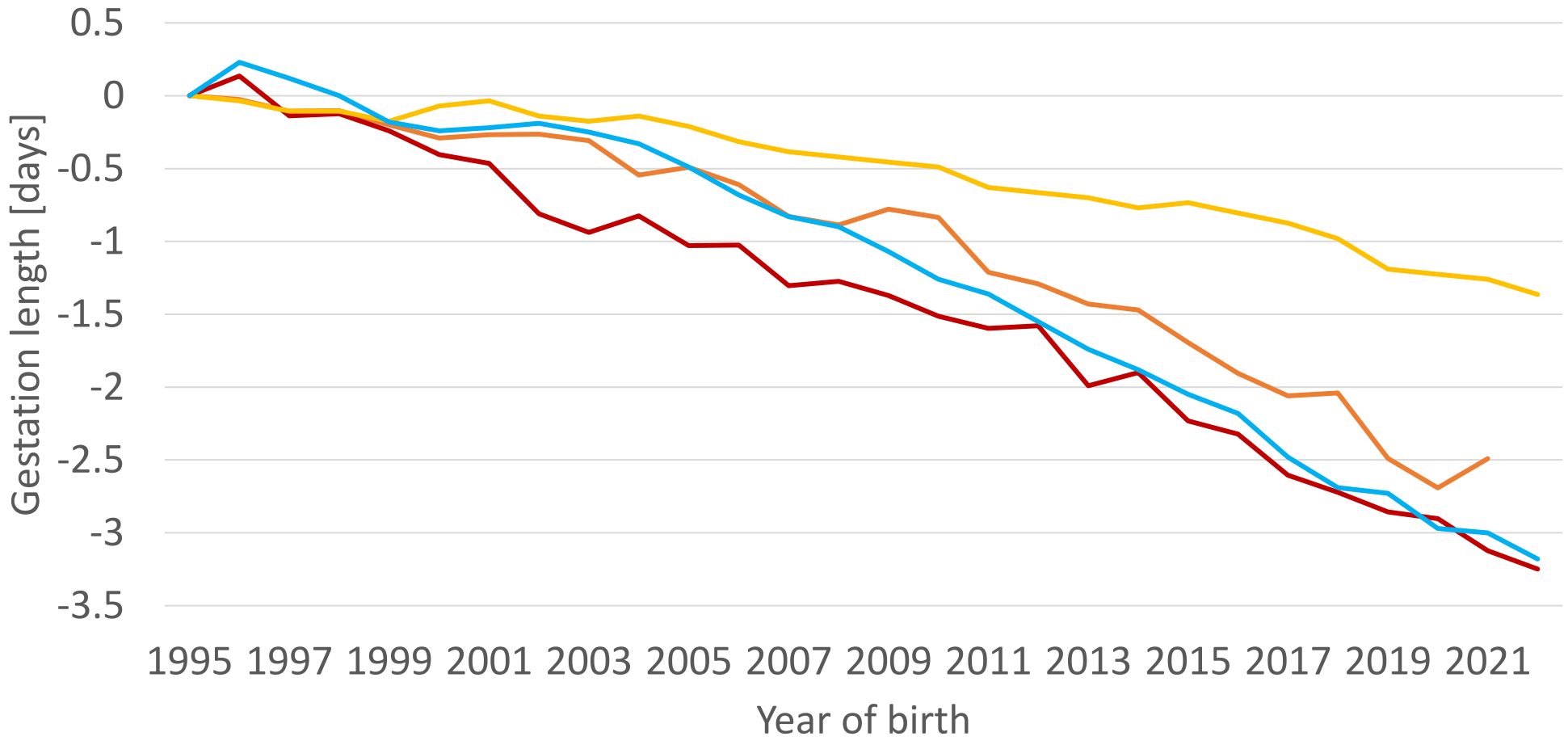
Genetic trends in GL



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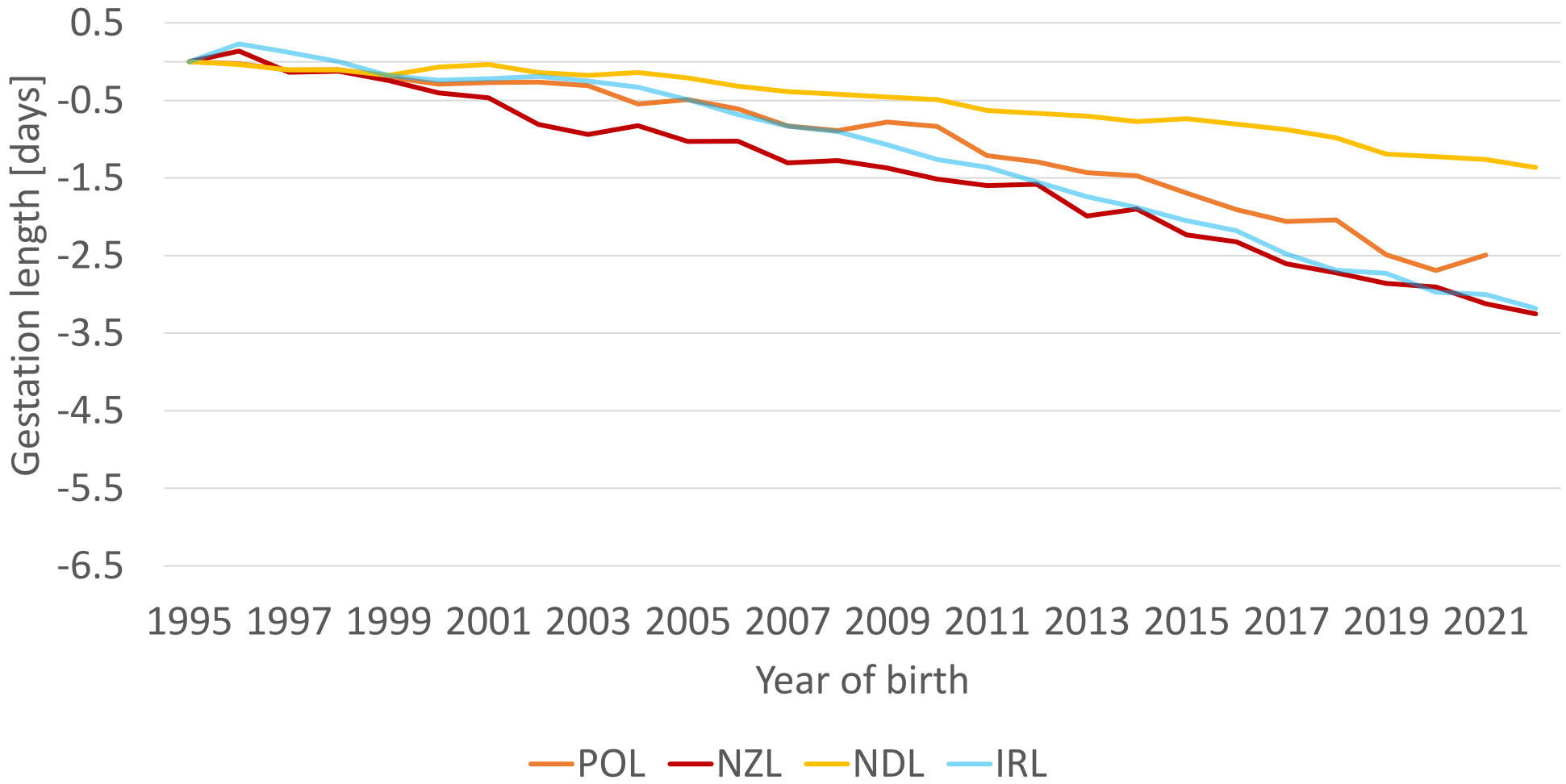

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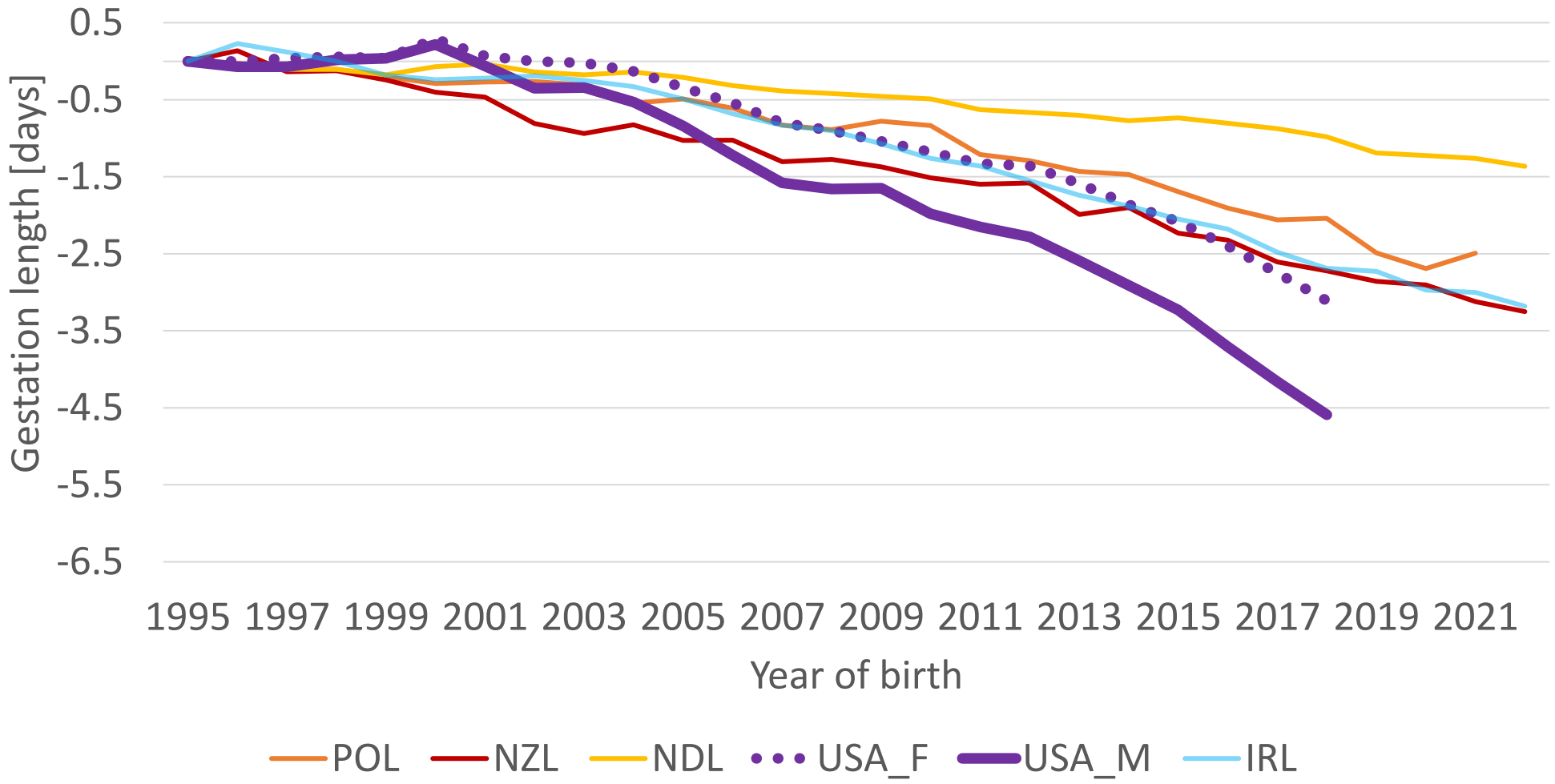

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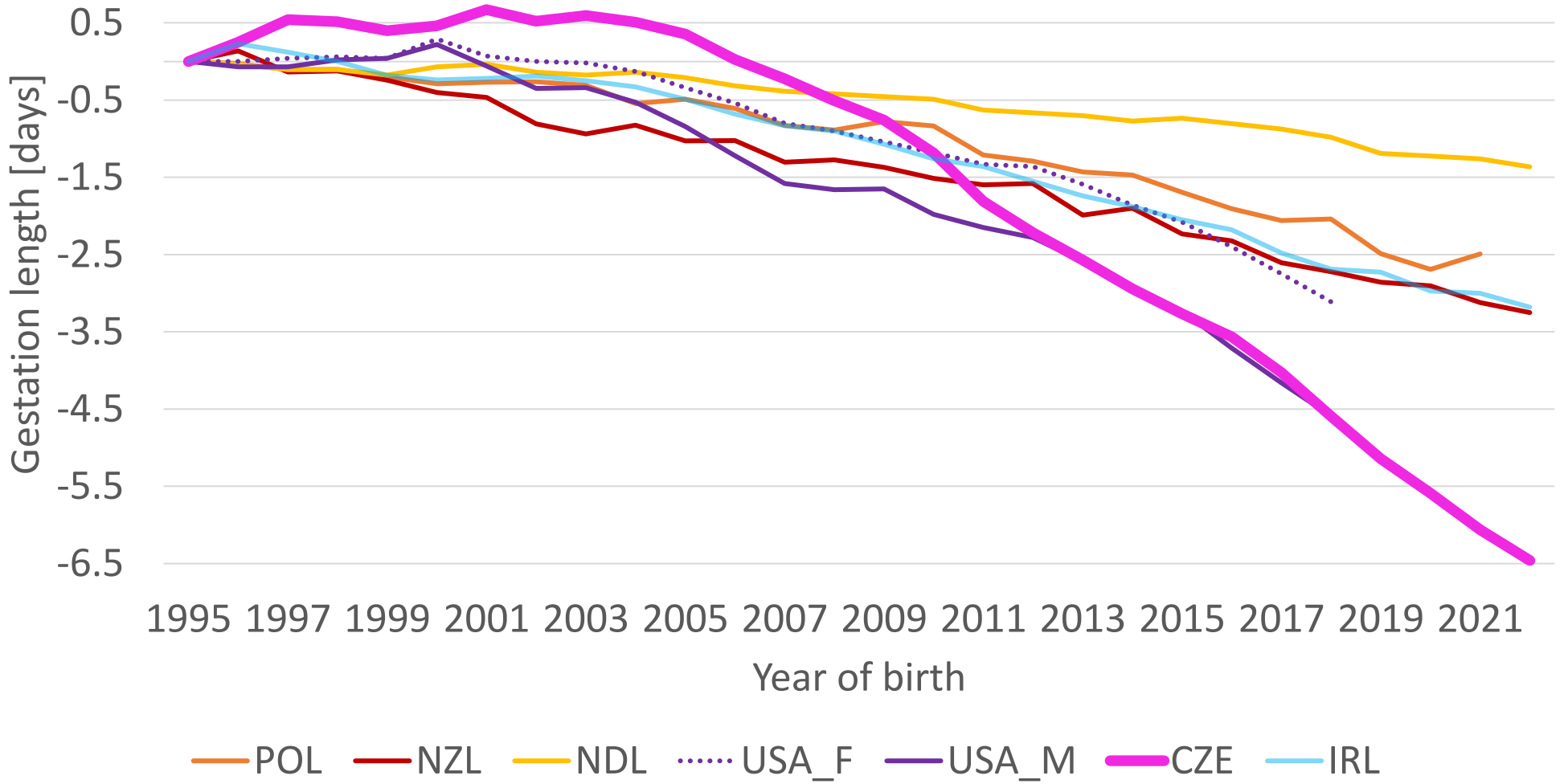

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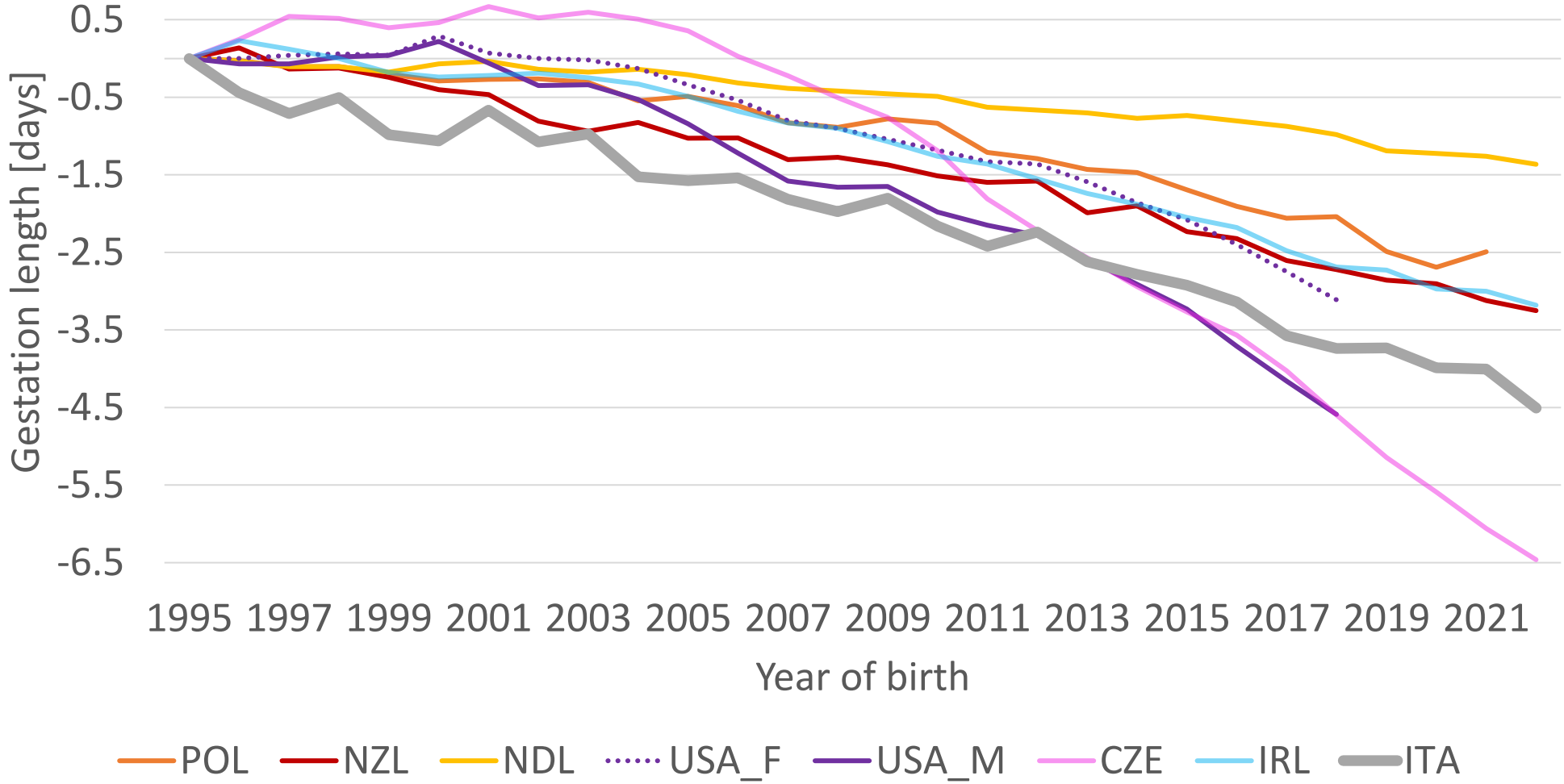

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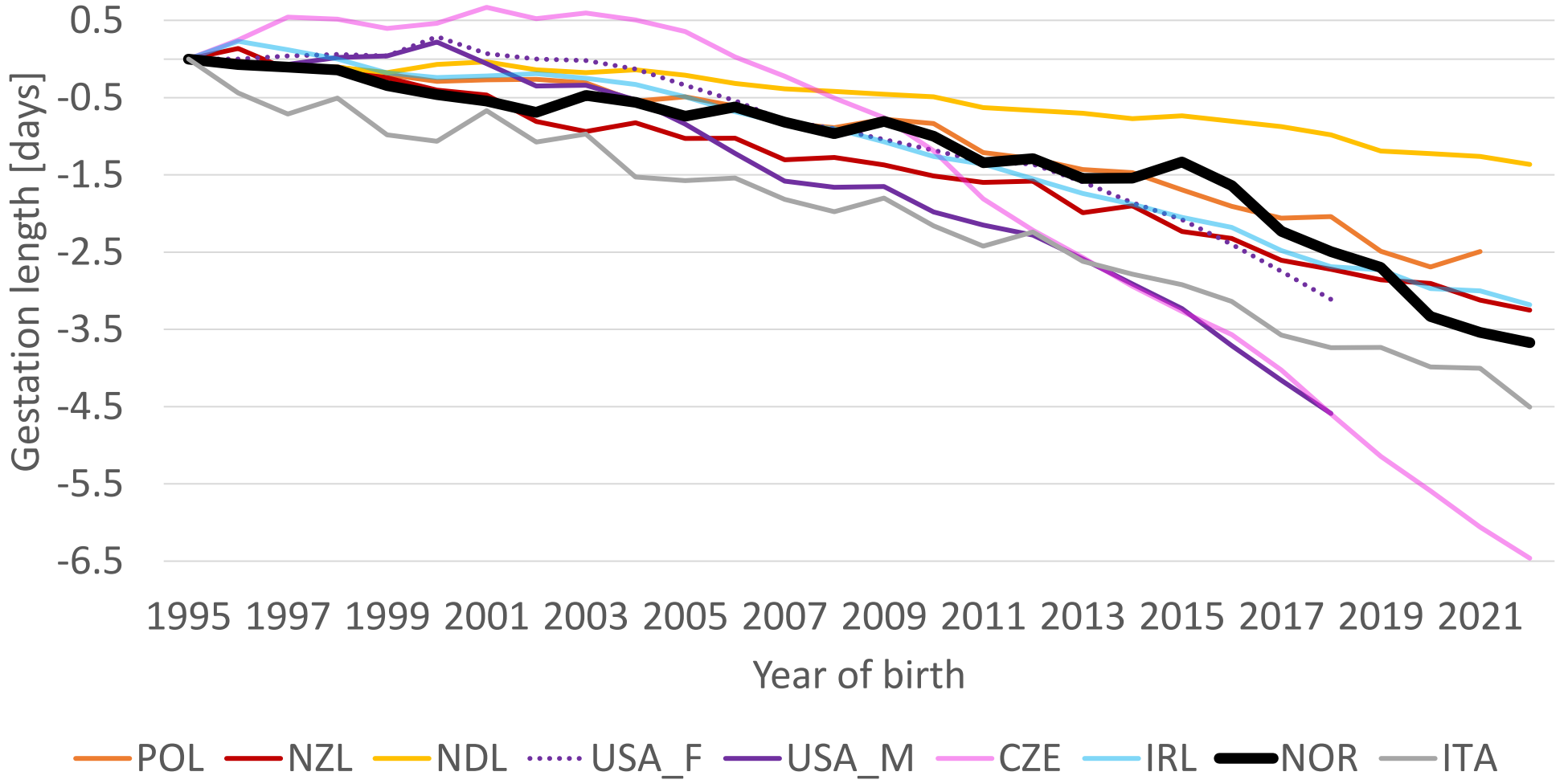

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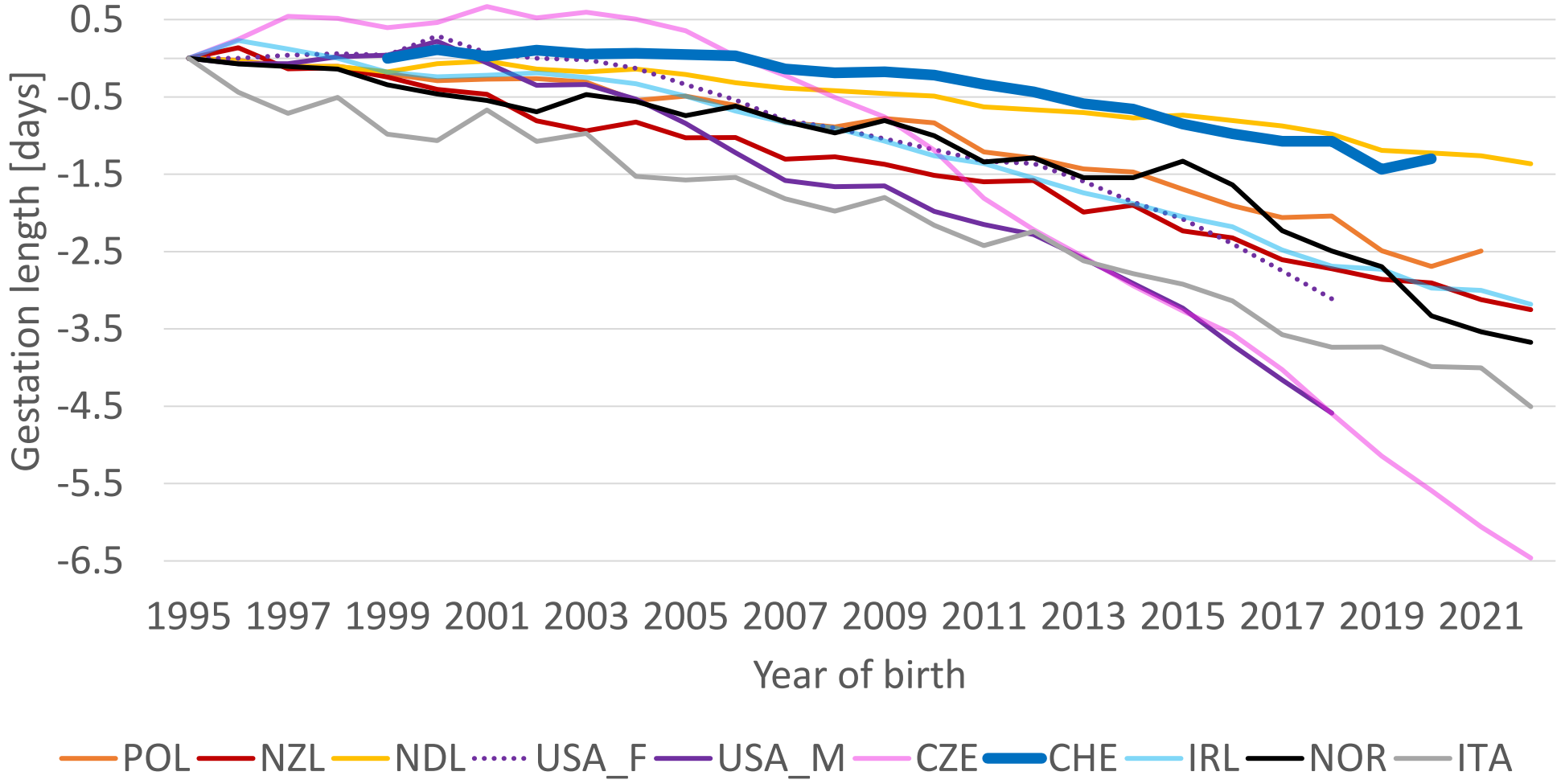

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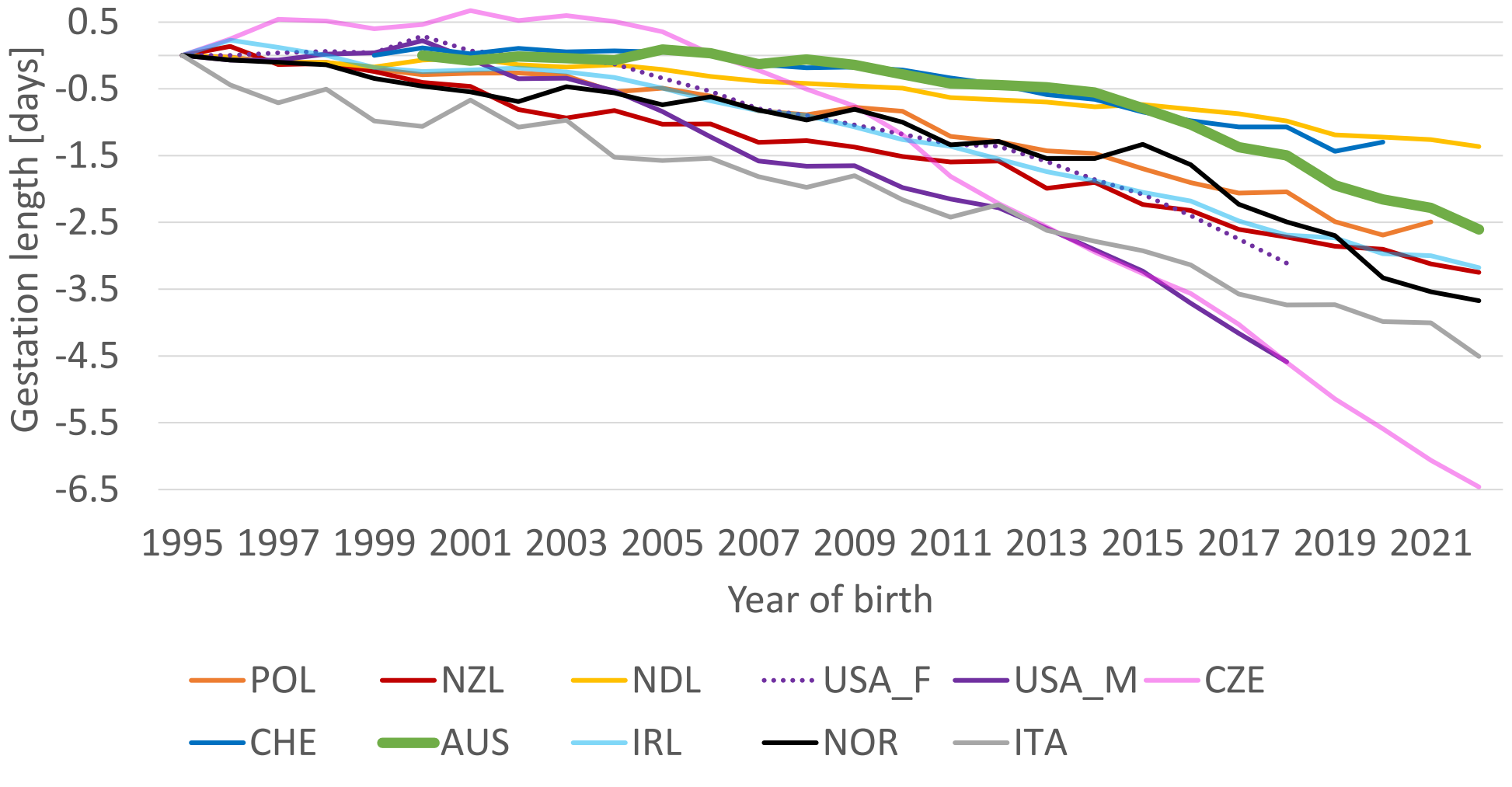

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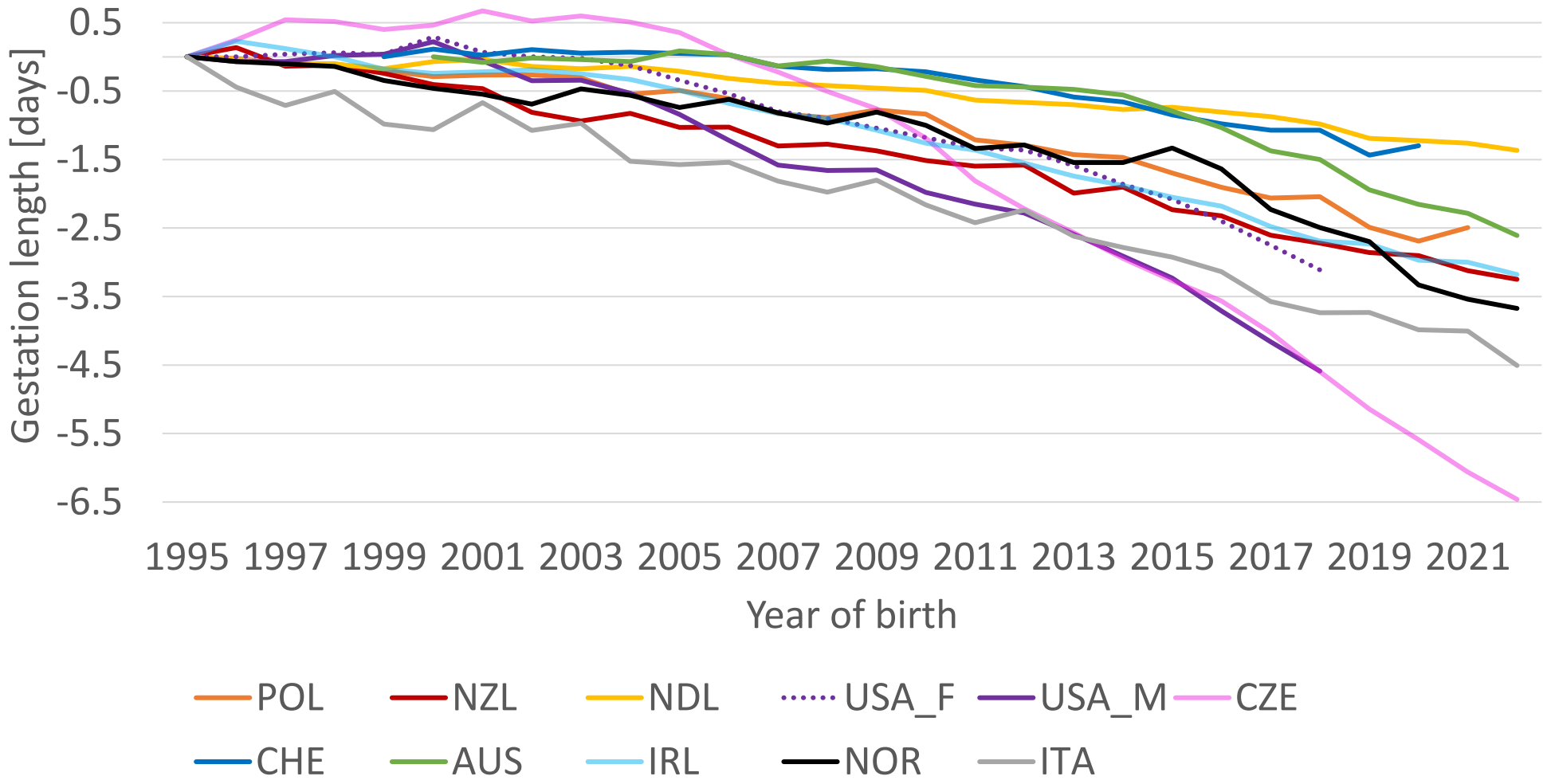

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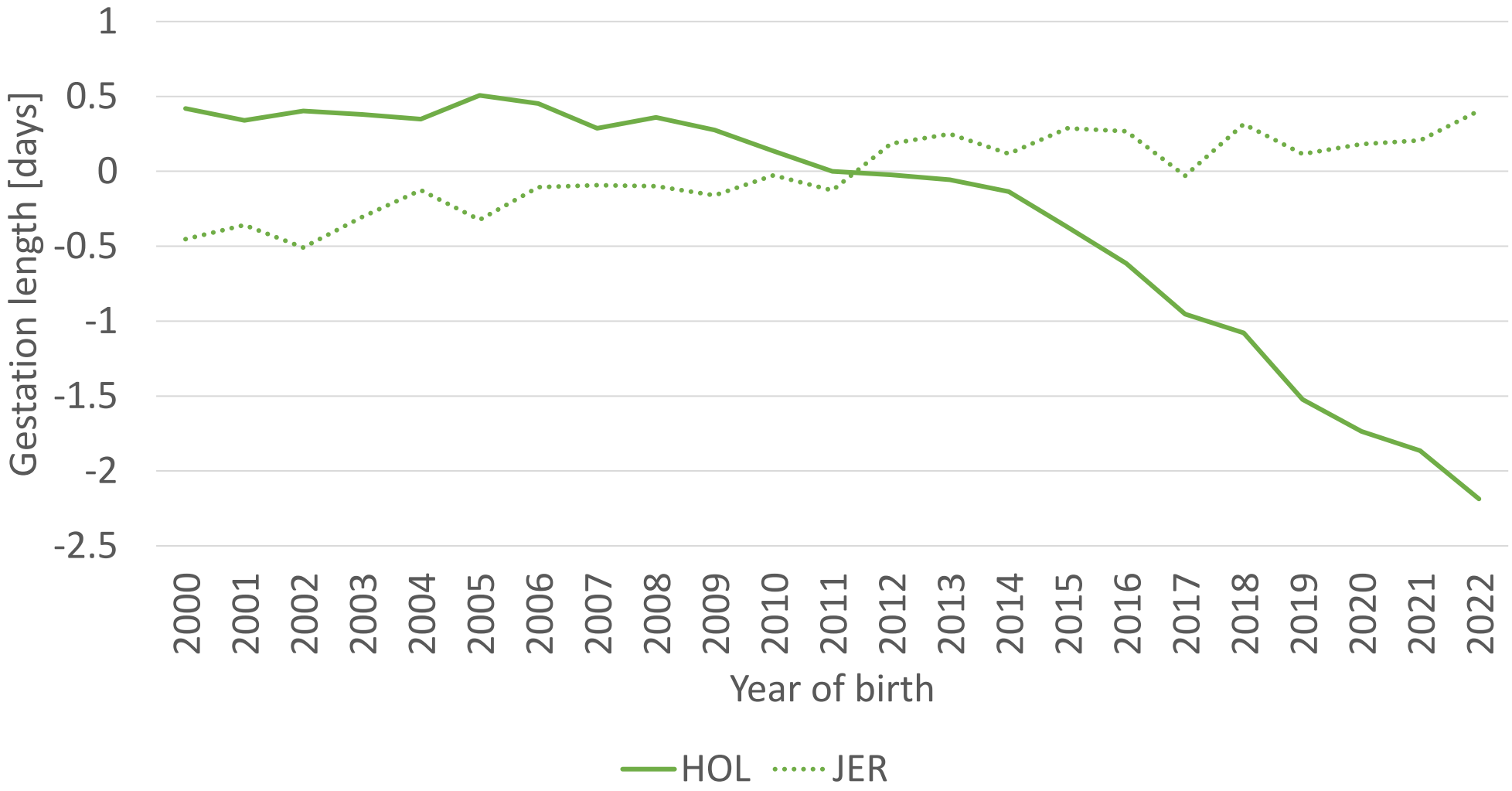
Breed? [AUS]



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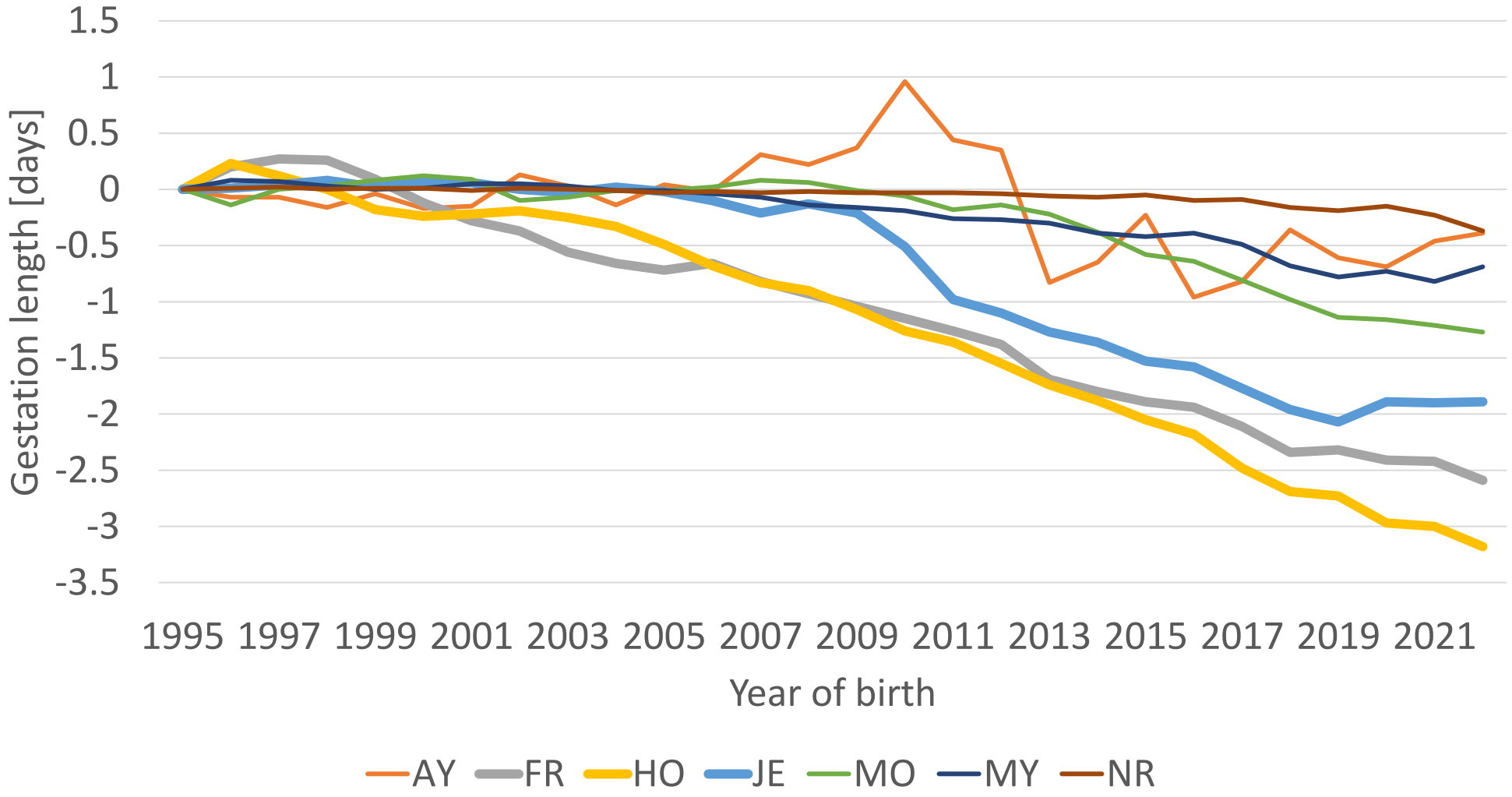
Breed? [IRL]



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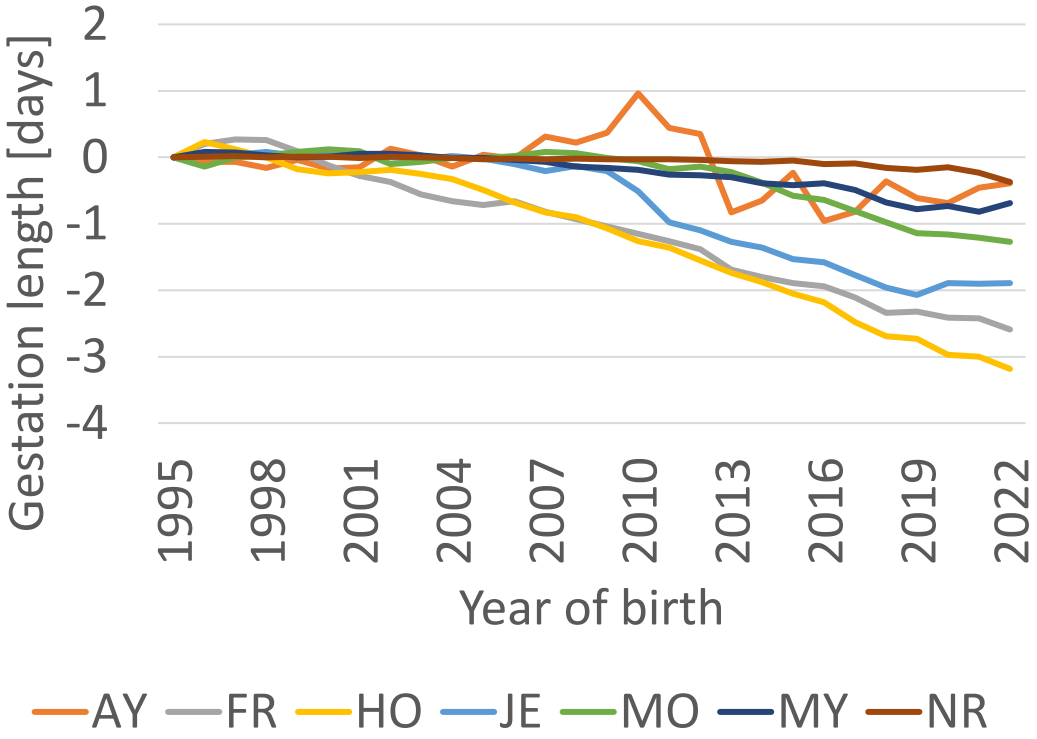

ORIGINAL RESEARCH article

Front. Genet., 05 November 2019

Sec. Livestock Genomics

Volume 10 - 2019 | https://doi.org/10.3389/fgene.2019.01068

Genomic Regions Associated With Gestation Length Detected Using Whole-Genome Sequence Data Differ Between Dairy and Beef Cattle

Deirdre C. Purfield[1*] Ross D. Evans[2] Tara R. Carthy[1] Donagh P. Berry[1]

[1] Animal & Grassland Research and Innovation Centre, Teagasc, Cork, Ireland

[2] Irish Cattle Breeding Federation, Cork, Ireland

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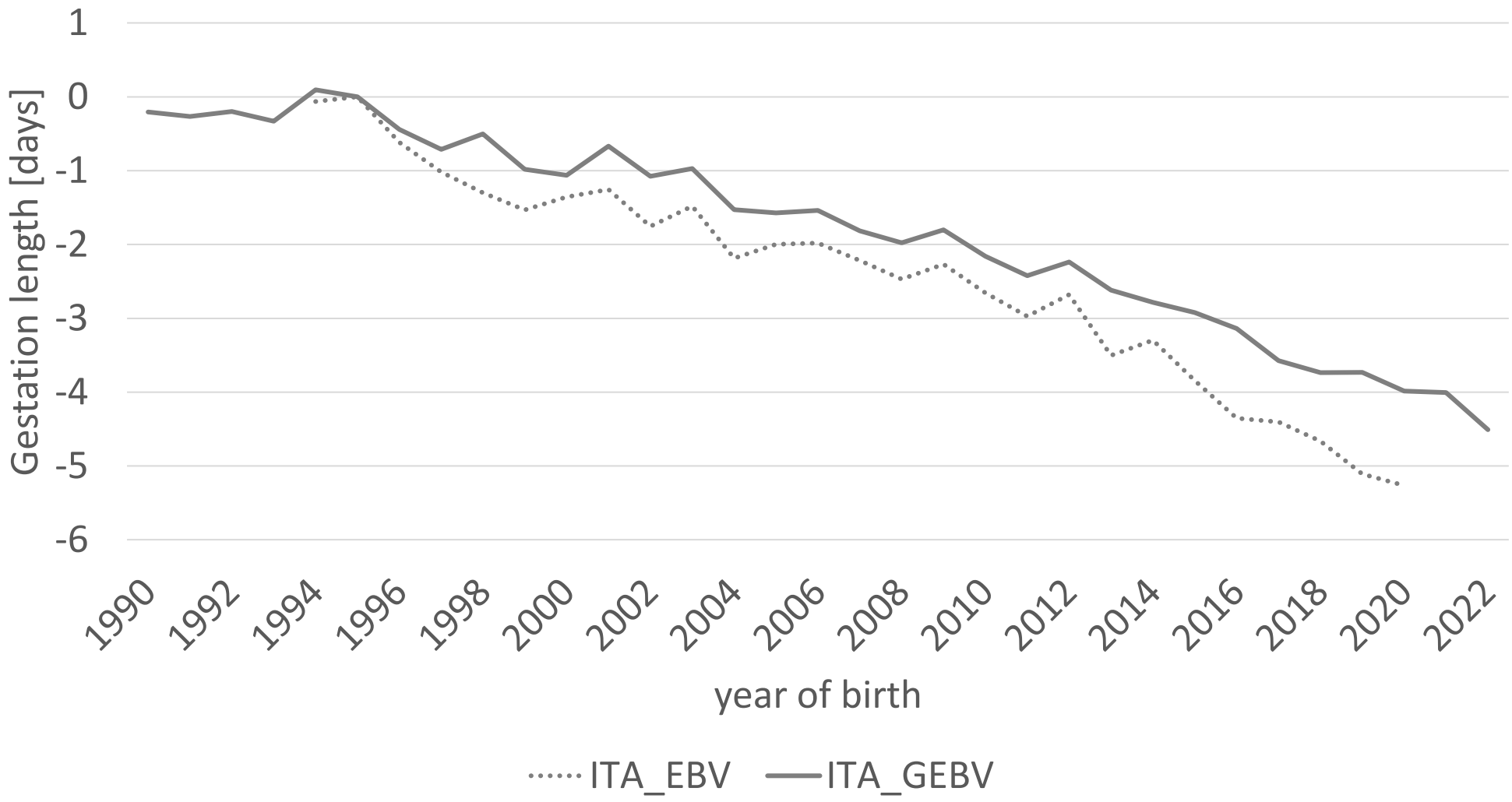
Genomics? [ITA]



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Tool to manage cows' fertility

Short gestation length semen

Boost profits with a shorter calving period and more days in milk. Our teams of selectively bred bulls will reduce gestation length by up to 10 days.

They're a cost-effective alternative to natural mating bulls in weeks 7 to 10.

Benefits of short gestation length semen

Hide

Get cows in-calf in late mating.

SGL semen gives you:

- a more condensed calving spread
- more days in milk - and more profit
- more time for cows to recover.

LIC

DataGene
Solutions for Herd Development

Gestation Length ABV

Technote 20

Summary

The Gestation Length ABV allows farmers to identify bulls and cows whose calves will be born earlier than their expected due date. Using shorter gestation length bulls, especially in late calved cows, can increase days in milk and improve fertility by allowing the cow to have more time between calving and joining.

Every joining is an opportunity to make genetic gain. Select bulls from the Good Bulls Guide that meet your breeding objective. In situations where it is desirable to have a shorter gestation length, select Good Bulls with a Gestation Length ABV below 0.

To decrease Gestation Length in a herd, use genomic testing to select females with a Gestation Length ABV below 0.

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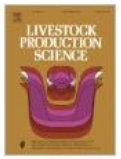
Correlations with other traits

ELSEVIER

Livestock Production Science
Volume 91, Issues 1–2, 1 December 2004, Pages 23-33



Gestation length in Danish Holsteins has weak genetic associations with stillbirth, calving difficulty, and calf size

M. Hansen [a b c], M.S. Lund [a], J. Pedersen [b], L.G. Christensen [c]

Genetic correlations with GL (ITA)	
Milk	-0.39
Fat	-0.34
Protein	-0.50
Calving ease	-0.49
Longevity	-0.25
Age at first calving	-0.42
Stillbirth	-0.39

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Correlations with other traits

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EBV correlations (NZL)	
Breeding Worth (Index)	-0.54
Fat	-0.50
Protein	-0.43
Milk	-0.25
Fat %	-0.11
Protein %	-0.23
Somatic Cell	-0.19
Fertility	-0.14
Functional Survival	-0.23
Heifer Calving Difficulty	0.01
Cow Calving Difficulty	0.07
Body Condition Score	-0.05
Liveweight	-0.06
Overall Opinion	-0.37
Stature	-0.04
Capacity	-0.27
Legs	-0.08
Udder Overall	-0.21
Dairy Conformation	-0.31

Impact?

J. Dairy Sci. 99:418–426
http://dx.doi.org/10.3168/jds.2015-9934

Phenotypic associations between gestation length and production, fertility, survival, and calf traits

G. M. Jenkins,* P. Amer,*[1] K. Stachowicz,* and S. Meier†
*AbacusBio Limited, PO Box 5585, Dunedin 9058, New Zealand
†DairyNZ, Private Bag 3221, Hamilton 3240, New Zealand

Both short and long gestation length animals produced significantly less milk and solids relative to intermediate-gestation-length cows, after adjusting for the day of the year they were born. However, for short gestation length cows, this effect disappeared when the earlier birth advantage was retained. Short gestation length cows did not exhibit a significant reduction in survival compared with intermediate gestation length cows. Short gestation length did not affect calving difficulty, but long gestation length was negatively associated with this trait. Calves gestated for shorter or longer periods were more likely to die in the perinatal period than other calves (3 and 7% higher incidence of mortality, respectively). **Overall, the net effects of shortened gestation lengths are likely to be economically positive.**

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Impact?

J. Dairy Sci. 92:2259–2269
doi:10.3168/jds.2007-0982

Genetic and environmental factors that affect gestation length in dairy cattle

H. D. Norman,[1] J. R. Wright, M. T. Kuhn, S. M. Hubbard, J. B. Cole, and P. M. VanRaden
Animal Improvement Programs Laboratory, Agricultural Research Service, USDA, Beltsville, MD 20705-2350

Several genetic and environmental factors can help improve prediction of calving date, but most improvement requires documented data on breed, parity, age, conception month, DIM, milk yield, service sire, cow sire, and evidence of impending multiple births. **Intentional selection for either shorter or longer GL without consideration of other dependent traits (e.g., calving ease and stillbirth) is not recommended without additional research.**

Knowledge of which environmental and genetic factors impact GL should lead to improved performance of US dairy cattle. (…) More accurate predictions of GL also can assist managers in meeting targeted lengths for dry periods. **Future research can determine and clarify relationships of GL with dystocia, stillbirth, and other health traits as data for those traits become more available through improved recording.**

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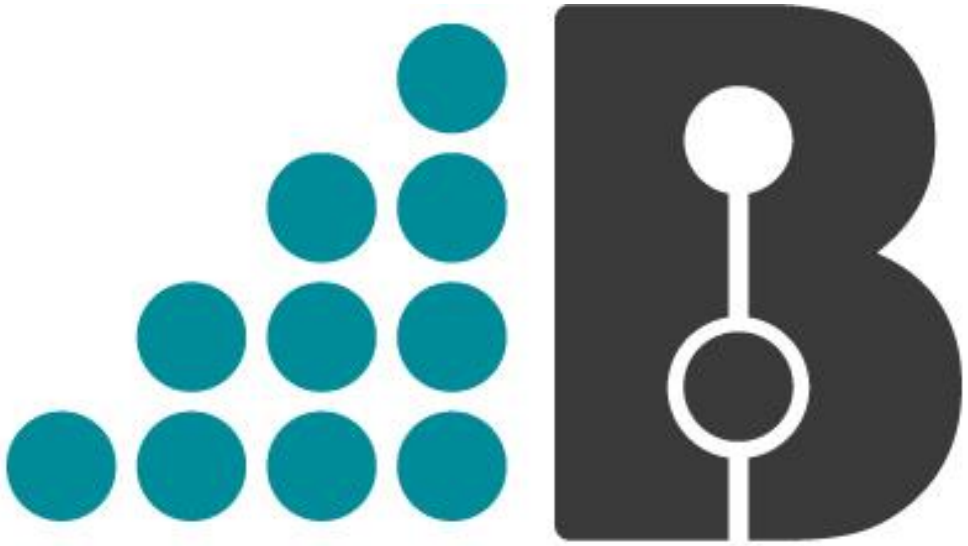
Final remarks

- Decreasing genetic trends
- Indirect selection pressure (through fertility?)
- Has significant economic value
- NZL – plans on introducing fertility trait independent from GL and including GL in the index with non-linear weighting
- Worth monitoring
- MACE evaluations?

Photograph by Mark Mitchell

Make a difference to food production internationally using science & technology



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