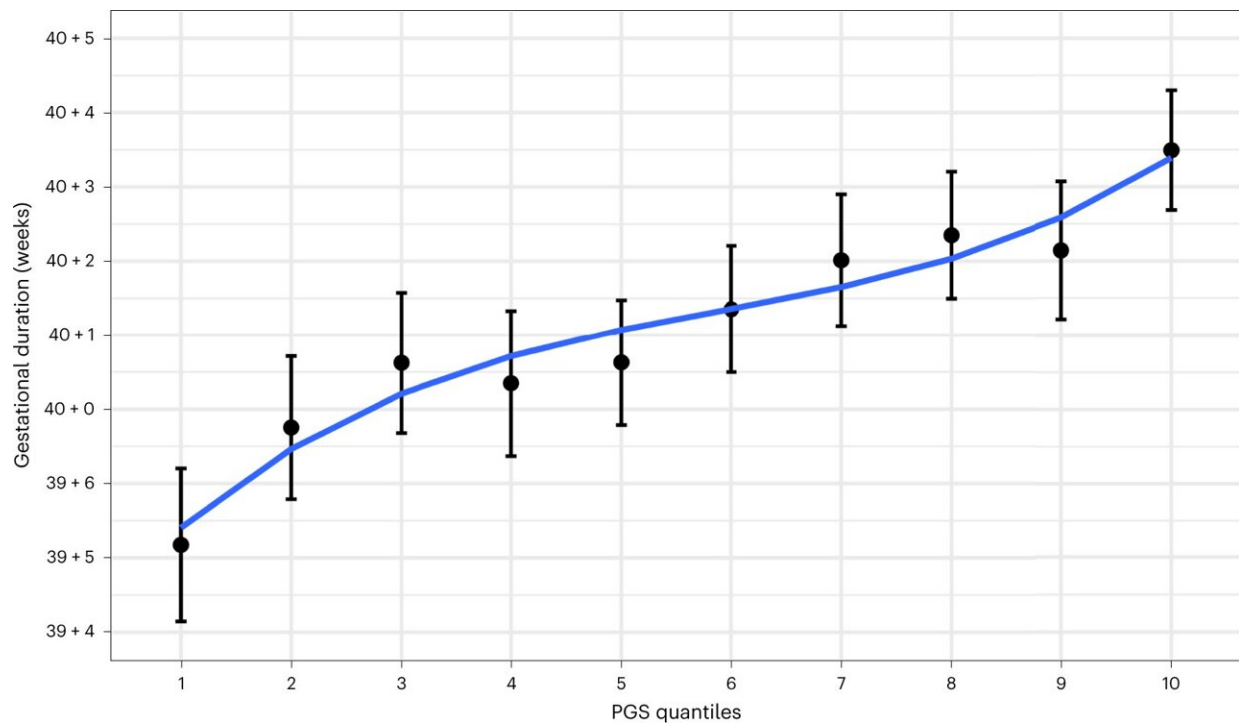


# Genetics of preterm birth and pregnancy length clarified

April 3 2023



Polygenic prediction of gestational duration. Mean (95% CI) gestational duration for each decile of the gestational duration polygenic score (n = 3,943). Only spontaneous deliveries were considered. PGS, polygenic score. Credit: *Nature Genetics* (2023). DOI: 10.1038/s41588-023-01343-9.

<https://www.nature.com/articles/s41588-023-01343-9>

New knowledge of the genetic factors behind premature delivery and gestational duration has now emerged. Findings presented by a major

international study under the aegis of the University of Gothenburg include the ways in which, before birth, the woman's and the unborn child's genes have mutually antagonistic effects.

These results, now published in the journal *Nature Genetics*, enhance the potential for long-term development of drugs to induce parturition ([birth](#)) and—even more importantly—achieve the goal of preventing preterm births.

Globally, preterm (or premature) birth is the most frequent immediate cause of death among newborns and children aged up to five years; and the earlier the parturition, the higher the risk. "Preterm birth" refers to delivery before the 37th week of pregnancy. Most births take place in gestation week 39 or 40.

Bo Jacobsson, professor of obstetrics and gynecology at Sahlgrenska Academy, University of Gothenburg, and senior consultant doctor at Sahlgrenska University Hospital, led the study. His previous advances in this area were already acclaimed.

## **New understanding of mechanisms**

The minimal margins in a human birth set us apart from other mammals. A woman's pelvis barely allows a fully grown fetus to pass through; in contrast, a female chimpanzee's pelvic passage, for example, has twice the diameter as that of her young.

The process preceding a [human birth](#) is thus extremely critical, and to enhance understanding of the processes governing when the onset of labor takes place, it is human beings specifically who need to be studied—in this case, the genetics of the woman and her unborn child.

The present study surpasses its predecessors in size and breadth. This

time, some 90 researchers from the Early Growth Genetics Consortium (EGG), an international network, took part. Just over 20 international birth cohorts comprising a total of 279,043 individuals studied, were included.

"The results have given us more routes to understanding how labor is initiated, both at full term and in premature labor. In samples, we were able to identify numerous previously undiscovered genetic variants associated with the timing of parturition, and these provide unmatched insights into the underlying biological mechanisms," Jacobsson notes.

## **Maternal–fetal genetic deal**

To understand whether gestational duration is determined by the genes of the woman or the fetus, we examined 136,833 cases. These involved either the combination of both parents and their offspring or the woman and her offspring, enabling the effects of the woman's and the child's genome respectively to be distinguished with greater precision.

The first author of the study, Pol Solé Navais, is a researcher at the University of Gothenburg's Sahlgrenska Academy. He describes how the findings support the hypothesis of genetic conflicts between mother and child.

"What we see is that there might be a conflict between the genomes of the woman and unborn child respectively when it comes to the duration of pregnancy. Genetically, the woman's genes favor earlier onset of labor to expel the child, for her own survival, while those of the [unborn child](#) favor extension of the pregnancy to gain weight. So, they reach a kind of compromise deal," he says.

In the long run, the research has two aims: to develop drugs that can prevent [preterm birth](#), and to mitigate or boost contractions during

delivery. According to the researchers, their study results show that studies on [human genetics](#) are a good way to find conceivable targets for these drug therapies.

**More information:** Pol Solé-Navais, Genetic effects on the timing of parturition and links to fetal birth weight, *Nature Genetics* (2023). [DOI: 10.1038/s41588-023-01343-9](#).  
[www.nature.com/articles/s41588-023-01343-9](http://www.nature.com/articles/s41588-023-01343-9)

Provided by University of Gothenburg

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