

# Large headed women found to have pelvis shape to allow for delivery of large headed babies

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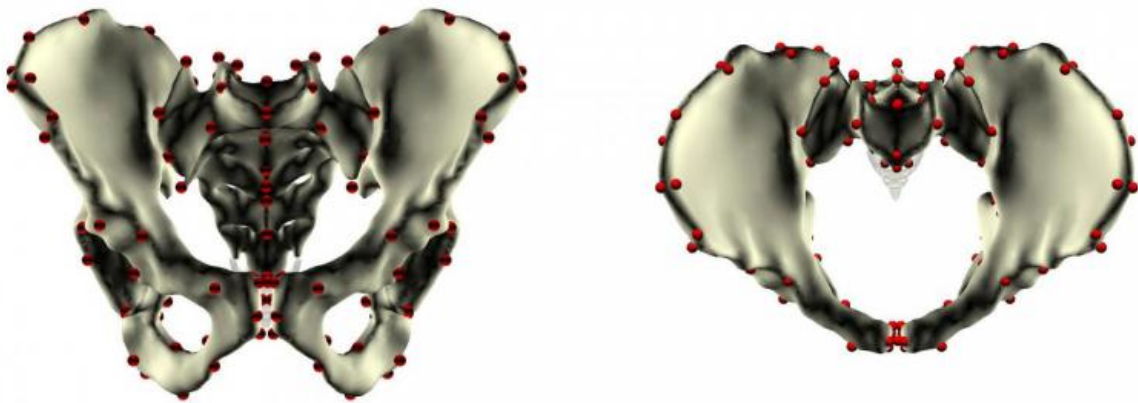


The skull of a newborn must fit through the female pelvis at birth -- it has to be as big as the diameter of the birth canal. Credit: Copyright: Magdalena Fischer

(MedicalXpress)—A pair of researchers, one with the University of Oslo, in Norway, the other with the University of Vienna in Austria, has found that women with large heads tend to have birth canals that are shaped differently on average to accommodate what will likely be babies being born with larger heads. In their paper published in *Proceedings of the National Academy of Sciences*, Barbara Fischer and Philipp Mitteroecker describe how they analyzed multiple human skeletons and noticed a trend—women with large heads had slightly differently shaped birth canals.

Big heads do not always mean large egos—some people actually have heads that are physically larger than average, which causes some other people, mostly women, to wonder about how things went when that baby was being delivered—a large [head](#), it would seem, would have more difficulty passing through the pelvic bones that make up the birth canal, causing the mother more distress than for mothers delivering smaller headed babies. But nature has found a way to help, it appears, as the two researchers discovered.

As part of a larger study to try to understand why it is that female human beings have on average narrow hips and thus a small [pelvis](#), relative to baby size, the researchers examined 99 [human skeletons](#), looking for clues. While they were not able to answer the question of why the female pelvis has not grown larger to accommodate the larger head that has evolved to hold our growing brains, they did spot a trend—they noticed that women with larger heads tended to have a [birth canal](#) that was structured slightly differently that would help in allowing passage of a baby with a larger than average head. A nice adaptation, they note, for such women, but it does not explain why the female pelvis has not evolved along with the brain—thanks to modern medicine, many more women today survive childbirth than at any other time in history, but if the pelvis had widened over the past generations, than women giving birth would not be at so much risk in the first place.



With the use of 3-D data, the authors identified a relationship between the shape of the pelvis, the body size and head circumference. Credit: Copyright: *PNAS*

The researchers note that the pelvis actually serves two purposes for [women](#), reproduction and locomotion—they suggest that nature has preserved the smaller pelvis because of some locomotive advantage, though no one has been able to show what that advantage might be.

**More information:** Covariation between human pelvis shape, stature, and head size alleviates the obstetric dilemma, Barbara Fischer, *PNAS*, [DOI: 10.1073/pnas.1420325112](https://doi.org/10.1073/pnas.1420325112)

## Abstract

Compared with other primates, childbirth is remarkably difficult in humans because the head of a human neonate is large relative to the birth-relevant dimensions of the maternal pelvis. It seems puzzling that females have not evolved wider pelvises despite the high maternal mortality and morbidity risk connected to childbirth. Despite this seeming lack of change in average pelvic morphology, we show that humans have evolved a complex link between pelvis shape, stature, and head circumference that was not recognized before. The identified covariance patterns contribute to ameliorate the "obstetric dilemma." Females with a large head, who are likely to give birth to neonates with a large head, possess birth canals that are shaped to better accommodate large-headed neonates. Short females with an increased risk of cephalopelvic mismatch possess a rounder inlet, which is beneficial for obstetrics. We suggest that these covariances have evolved by the strong correlational selection resulting from childbirth. Although males are not subject to obstetric selection, they also show part of these association patterns, indicating a genetic–developmental origin of integration.

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