Summer babies grow up to be healthier adults

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Researchers from the study, published in the journal *Heliyon*, come from the Medical Research Council (MRC) Epidemiology Unit at the University of Cambridge in the UK.

They say their findings support the "fetal programming" hypothesis, which suggests that the environment in the womb leads to early life differences that can then affect health later in life.

Previous studies have found that birth season - which is indicative of in-utero vitamin D exposure - is associated with a wide range of health effects. The researchers note that "the most compelling associations to date appear to be those with immune-related disease, such as type 1 diabetes and multiple sclerosis."

Meanwhile, other studies have suggested a link between season of birth and birth weight.

"When you were conceived and born occurs largely at random," says lead author Dr. John Perry, "it's not affected by social class, your parents' ages or their health, so looking for patterns with birth month is a powerful study design to identify influences of the environment before birth."

He and his team believed the time during childhood growth and development is a significant link between early life and later health, so they set out to study the impact of birth month in more detail - investigating whether birth month had an effect on birth weight, onset of puberty in girls and adult height.

Babies born June-August have higher birth weights, are taller adults

To conduct their research, the team used data from the UK Biobank study - a major national health resource - to compare the growth and development of about 450,000 men and women. According to the team, this is the "most comprehensive assessment to date of the impact of birth season on childhood growth and physical development."

Results showed that babies who were born in June, July and August had higher birth weights and were taller as adults, and girls born during these months started puberty later - which is an indicator of better health in adulthood.

Interestingly, babies born in December, January and February showed outcomes that were "directionally opposite" to the outcomes for those born in the summer months.

These associations were seen with total hours of sunshine during the second trimester but not during the first 3 months after birth, and there were further associations regarding educational attainment. Specifically, those born in autumn were more likely than their summer-born counterparts to continue in education past the age of 16 or to achieve a degree-level qualification.

Dr. Perry says their study is the first to link puberty timing with seasonality but adds that "more work is needed to understand the mechanisms behind this effect."

He and his team hypothesize that these seasonal differences could be down to how much sunlight the mother receives during pregnancy - a factor that affects vitamin D levels. Commenting further, Dr. Perry says:

> "We don't know the mechanisms that cause these season of birth patterns on birth weight, height and puberty timing. We need to understand these mechanisms before our findings can be translated into health benefits.
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> We think that vitamin D exposure is important, and our findings will hopefully encourage other research on the long-term effects of early life vitamin D on puberty timing and health."

Study strengths and limitations

Their study has many strengths, including a large sample size of people "without biased ascertainment for birth," but there are still some limitations.

One such limitation is that the study did not include a direct measurement of maternal or fetal vitamin D status to be able to establish a causal relationship. What is more, there was not any data on maternal location, individually measured exposure to sunshine or vitamin D supplementation during pregnancy.

Regarding the last point, however, the researchers say that even the youngest participant in the UK Biobank - who was aged 38 - was conceived during a point in time when pregnant women were not encouraged to supplement with vitamin D in the UK.

A final limitation is that self-reported variables could be inaccurate or subject to recall bias, and there was no measure of puberty onset for men.

Still, despite these limitations, the study supports the impact that season of birth has on childhood and development. The researchers note that although other mechanisms could contribute to their findings, they "are consistent with a possible role of in-utero vitamin D exposure."

In June of this year, *Medical News Today* reported on a study that found a link between 55 diseases and season of birth, ultimately concluding that being born in October results in the worst lifetime health risks.