

# Ancient remains put teeth into Barker hypothesis

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Ancient human teeth are telling secrets that may relate to modern-day health: Some stressful events that occurred early in development are linked to shorter life spans.

"Prehistoric remains are providing strong, physical evidence that people who acquired tooth enamel defects while in the womb or early childhood tended to die earlier, even if they survived to adulthood," says Emory University anthropologist George Armelagos.

Armelagos led a systematic review of defects in teeth enamel and early mortality recently published in [Evolutionary Anthropology](#). The paper is the first summary of prehistoric evidence for the Barker hypothesis - the idea that many adult diseases originate during fetal development and early childhood.

"Teeth are like a snapshot into the past," Armelagos says. "Since the chronology of enamel development is well known, it's possible to determine the age at which a physiological disruption occurred. The evidence is there, and it's indisputable."

The Barker hypothesis is named after epidemiologist David Barker, who during the 1980s began studying links between early infant health and later adult health. The theory, also known as the Developmental Origins of Health and Disease Hypothesis (DOHaD), has expanded into wide acceptance.

As one of the founders of the field of bioarcheology, Armelagos studies skeletal remains to understand how diet and disease affected populations. Tooth enamel can give a particularly telling portrait of physiological events, since the enamel is secreted in a regular, ring-like fashion, starting from the second trimester of fetal development. Disruptions in the formation of the enamel, which can be caused by disease, poor diet or [psychological stress](#), show up as grooves on the [tooth surface](#).

Armelagos and other bioarcheologists have noted the connection between dental enamel and early mortality for years. For the [Evolutionary Biology](#) paper, Armelagos led a review of the evidence from eight published studies, applying the lens of the Barker hypothesis to remains dating back as far as 1 million years.

One study of a group of Australopithecines from the South African Pleistocene showed a nearly 12-year decrease in mean life expectancy associated with early enamel defects. In another striking example, remains from Dickson Mounds, Illinois, showed that individuals with teeth marked by early life stress lived 15.4 years less than those without the defects.

"During prehistory, the stresses of infectious disease, poor nutrition and psychological trauma were likely extreme. The teeth show the impact," Armelagos says.

Until now, [teeth](#) have not been analyzed using the Barker hypothesis, which has mainly been supported by a correlation between birth weight in modern-day, high-income populations and ailments like diabetes and heart disease.

"The prehistoric data suggests that this type of dental evidence could be applied in modern populations, to give new insights into the scope of the

Barker hypothesis," Armelagos says. "Bioarcheology is yielding lessons that are still relevant today in the many parts of the world in which infectious diseases and under-nutrition are major killers."

Provided by Emory University

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