A stressful legacy: Childhood stress and longevity

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Episodes of physiological stress experienced during childhood are often linked to decreased longevity. While studies have often shown a positive association between increasing numbers of childhood stress episodes and correspondingly earlier ages at death (i.e. weathering due to accumulated stress), research has also demonstrated that repeated stress episodes are more likely to occur following an early age at stress onset (i.e. it is the timing of defects that is central to long term cost). We explore these models, weathering versus defect timing, by reanalysing enamel hypoplasia and age at death in a series of individuals from Bahrain Island (Bronze age, Iron age, Hellenistic and Islamic periods, n=160). In all four samples, more than 80% of individuals have least one hypoplastic defect. The highest frequency is amongst sub-adults e.g the 10-15 yrs in the Hellenistic sample had 3.2 defects on average compared with <2 defects for adults over 30 yrs, which might suggest a weathering effect. However, the children in this sample who died between 3-10 yrs had significantly fewer defects, which does not correspond to a simple model of weathering. In contrast, all sub-adults with LEH experienced earlier onset – suggesting that timing is important.

We argue that both timing and weathering are factors but that the relative importance of these relationships is explicitly mediated by the developmental environment of children which in this instance includes variable infection rates.