

Paleodemographic and Biochemical Analysis of Urbanization, Famine, and Mortality

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Urbanization is a transitional period often associated with deteriorating population health and increased mortality, as the rapid increase of population density in urban centers facilitates the transmission of infectious diseases, unsanitary living conditions, and precarious food supplies. Research on the transition to an urban environment in the past offers a temporal depth to our understanding of the consequences of urbanization that cannot be accomplished through examination of contemporary populations. This project integrates paleodemographic (hazard analysis) and biochemical (stable isotope analysis) approaches to examine the health and diet of inhabitants in late medieval England (c. 1120-1539 CE), specifically the relationship between pathology and nutrition during urbanization and incidences of famine. Skeletal data and samples from the urban St Mary Spital cemetery in London and contemporaneous rural cemetery of Barton-upon-Humber, England were analyzed to: (1) determine how survivability patterns in medieval London changed over time as a result of intensive urbanization; (2) evaluate how temporal changes in mortality and survival of medieval London compare to the rural population of England; (3) investigate the relationship between diet and health during the transition to a more urban environment; and (4) examine how potential biochemical markers of famine are manifested in medieval London using stable isotope analysis, including an innovative incremental dentine analysis method. The results of hazard and survival analyses suggest that the effects of urbanization on survivability and mortality varied by sex and age. Specifically, results show that, for adults, urbanization may have been more detrimental to health than the rural environment but the implementation of sanitation directives in London as urbanization progressed may have improved living conditions through time. Analyses of stable isotope values from bone collagen samples in St Mary Spital reveal different dietary patterns between age groups and through time. Differences in isotope values between famine- and non-famine periods may be the consequence of famine or migration rather than differences in physiological stress. This project serves as the first bioarchaeological study to investigate urbanization using both paleodemographic and biochemical approaches, providing, a comprehensive and nuanced depiction of health and nutrition in an urbanizing environment.