

Warfare and Structural Violence in Mississippian-Period Southeastern North America

CHARLES COBB* & DAWNIE STEADMAN**

The Plague of Athens is one of the earliest Western accounts of the victimization of non-combatants through the indirect effects of large-scale conflict. In the eye-witness description by Thucydides, the plague first struck in 430 BCE during the Peloponnesian War while the city was under siege by Sparta (Holladay and Pool 1979). Successive waves of this still unidentified epidemic over the course of several years devastated a population crowded behind walls, low on food, and living in unhygienic conditions.

We take for granted that warfare exacts a terrible death toll among civilian populations, infamously illustrated by the bombings of London, Coventry, Dresden, and Hiroshima during World War II. The 21st century has given rise to such perverse euphemisms as “collateral damage” to hide the discomfort with this reality. As the Plague of Athens demonstrates, however, there is also a high collateral cost to warfare in terms of morbidity. Protracted, large-scale conflict creates living conditions that foster physiological stressors, compromise immune systems, and facilitate the spread of pathogens – conditions that can dramatically affect both populations that may be subject to only minimal direct violence and the biology of later generations of those populations.

We examine this phenomenon in more detail with respect to Native American communities of southeastern North America in the

centuries immediately prior to the arrival of Europeans (ca. 1000–1500 CE). Indigenous societies during this era were undergoing the equivalent of the Neolithic Revolution (hereafter the agricultural transition) as defined for the larger Mediterranean World (Blitz 2010; Cobb 2003; Wilson 2017). They were greatly increasing their dependence on domesticated plants, particularly maize; they were rapidly nucleating into sizable towns numbering in the hundreds, and in some cases, thousands of individuals; they were mobilizing their populations to erect impressive earthworks; they were developing expressions of distinct social hierarchy; and, they were engaging in warfare and experiencing sickness to an unprecedented degree for southeastern North America. It is our contention that there was a strong relationship between endemic conflict and morbidity in some regions of the Mississippian Southeast that is a variant of the phenomenon of structural violence.

Epidemiological transitions and structural violence

Beginning in the 1980s, a steady stream of bio-archaeological studies revealed that there was a dark side to the agricultural transition – and that was a broad pattern of declining health (e.g., Cohen and Armelagos 1984; Cohen 1989; Goring-Morris and Belfer-Cohen 2010; Larsen 2006). The widespread evidence for skeletal markers of infectious disease and nutritional stress was believed to correlate

* Florida Museum of Natural History, University of Florida, Gainesville, FL (USA)

** Department of Anthropology, University of Tennessee, Knoxville (USA)

with decreased diet breadth associated with dependence on domesticates, crowded living conditions, and other unanticipated costs on the road to “civilization.” It should be pointed out that there is not necessarily a direct or universal link between a rise in poor health (as expressed through hard tissue) and the evolution of social complexity. The notion of the so-called osteological paradox conceived by Wood et al. (1992) suggested that increased incidence of skeletal manifestations of morbidity could in fact reflect the fact that a greater proportion of the population was surviving bouts of severe illness and stress. As a generalization, however, anthropologists have shown that there are “epidemiological transitions” in a broad evolutionary framework that are characterized by a surge in clusters of diseases associated with certain thresholds of social and technological interaction and organization: Neolithic Revolutions, 19th-century industrialization, and the more recent spread of emergent and re-emergent diseases due to the forces of globalization (Barrett et al. 1998; Zuckerman et al. 2014).

Framing these broad trends against the ambiguities of the osteological paradox suggests the importance of local variables in shaping patterns of health. Whereas the general conditions of the agricultural transition may lay the groundwork for a rise in morbidity, many societies may follow paths of social complexity quite distinct from their neighbors, thereby leading to variable health outcomes. Further, not all interest groups within a society face the same health challenges or enjoy the same benefits because of differential access to basic resources. The authors of the seminal study on the osteological paradox recognized the importance of historical context in their summary observation that “*we suspect that both interpretations [Neolithic Revolutions may be a source of both adverse and positive health outcomes] may be correct for different periods and locations*” (Wood et al. 1992, 357).

We suggest that inter-group conflict represents one of those key variables that shapes different disease histories for societies undergoing agricultural transitions. In certain respects, the epidemiological consequences of warfare can be conceptualized as a variant of structural violence. Models of structural violence view inequality, poverty and adverse health as the result of institutionalized power networks that deflect resources away from certain segments of society. Scholars such as Johan Galtung (1969), who originated the concept, and Paul Farmer (2004), who have applied it to epidemiology, have defined structural violence as having both intended and unintended effects because it is rooted in exploitative strategies wielded by those holding the reins of power, but the direct consequences of those strategies were not necessarily premeditated. In pre-modern contexts, for example, onerous tribute demands may have been instituted to enrich the coffers of rulers, while starvation of taxpayers may have been one of the unforeseen consequences. In short, people may be unanticipated victims of long-term histories of overlapping, embedded institutions – histories that govern agency in such a way that alternative choices to destructive behaviors may not be evident or even socially possible (Bernbeck 2008).

Although anthropologists still lack a consensus as to why societies adopt agriculture, it is evident that this shift fosters structural constraints with unintended disadvantages as well as advantages. Agricultural strategies entail a number of scheduling commitments to the landscape related to sowing, harvesting, and so on. In turn, agricultural groups become more sedentary, often witness population increases, and forego some of the flexibility associated with hunters and gatherers – it can be very difficult (although not unheard of) for an agricultural community to return to a life of hunting and gathering because a complex welter of their choices is structured by their lifeway. Importantly, a number of the social and demographic conditions associated with

agriculture – notably sedentism, increases in labor investment, and population increase – also may have adverse health consequences. These may range from protein deprivation to stress related to the demands of field labor, all of which are triggers for compromised immune systems and an upsurge in morbidity and mortality. In addition, settled life and population expansion create natural reservoirs for crowd diseases. These are the interacting variables that in part define the first epidemiological transition that also corresponds with agricultural transitions.

It has also been noted that agricultural transitions are often associated with a rise in endemic warfare (Dye 2009; Ferguson 2006). This is not to say that all societies that made the shift to agriculture and sedentism necessarily engaged in inter-group conflict. For those that did, however, settlement topography often was a compromise between the need to effectively exploit local resources for subsistence and related purposes, and the need to provide personal and community safety under conditions of chronic conflict. Towns and cities begin to construct fortifications and their residents may reduce their mobility during times of conflict. Populations may also reside in compact hill towns or fortresses. The land around settlements may be clear-cut to provide better visibility. Communities also alter their subsistence patterns in response to conflict. They may, for example, adopt strategies to reduce movement away from areas of refuge by intensifying the localized exploitation of a small range of high-yield plants and animals.

All of these practices have health consequences. The narrowing of diet breadth among populations forced to dramatically reduce their movement may promote nutritional deficiencies that, in turn, undermine immune systems. Populations hunkered inside fortifications further enhance the reservoir-effect for crowd diseases. As seen in the case of the Plague of Athens, the massing of individuals during

times of war have led to some of the more spectacular eruptions of infectious disease. In the Western world, these include a major outbreak of syphilis in Europe among French troops outside Naples in 1495 (Baker and Armelagos 1988), and waves of typhus along the Christian and Moorish frontier during the final stage of the Reconquista in Iberia beginning in 1489 (Olson 1999). All of these processes – demography, agriculture, and ultimately, warfare – dovetail in such a way so as to create a new epidemiological landscape that is the culmination of centuries of decisions made by individuals and households. As a case study in this process of the structural violence, conflict, and health, we turn to southeastern North America in the first centuries of the second millennium CE.

Mississippian health and warfare in the Middle Cumberland region

Native American groups occupying what is today the southeastern and southerly mid-western United States after 1000 CE are referred to as “Mississippian” (Fig. 1). This is less an ethnic or social term, and more of a reference to diverse societies who exhibited a suite of similar traits or practices: notably sizable towns with earthen mound and plaza arrangements, maize agriculture, and social stratification. Warfare-associated activities among Mississippian groups seem to have increased significantly after ca. 1000 CE, coinciding with the agricultural transition and the rise of towns (Anderson 1994a; DePratter 1991; Dye 1995; Milner 1999). Fortifications, typically consisting of the remains of wooden palisades, are common at Mississippian sites (Krus 2016; Milner 1999). Occasionally, villages were overrun and burned to the ground (Price 1978). Further, bellicose imagery is common in Mississippian media, ranging from personal ornaments to rock art (Brown 1976; Cobb and Giles 2009; Knight 1986; Knight et al. 2001). Communities throughout the Southeast appear to have experienced another phase of escalated aggression

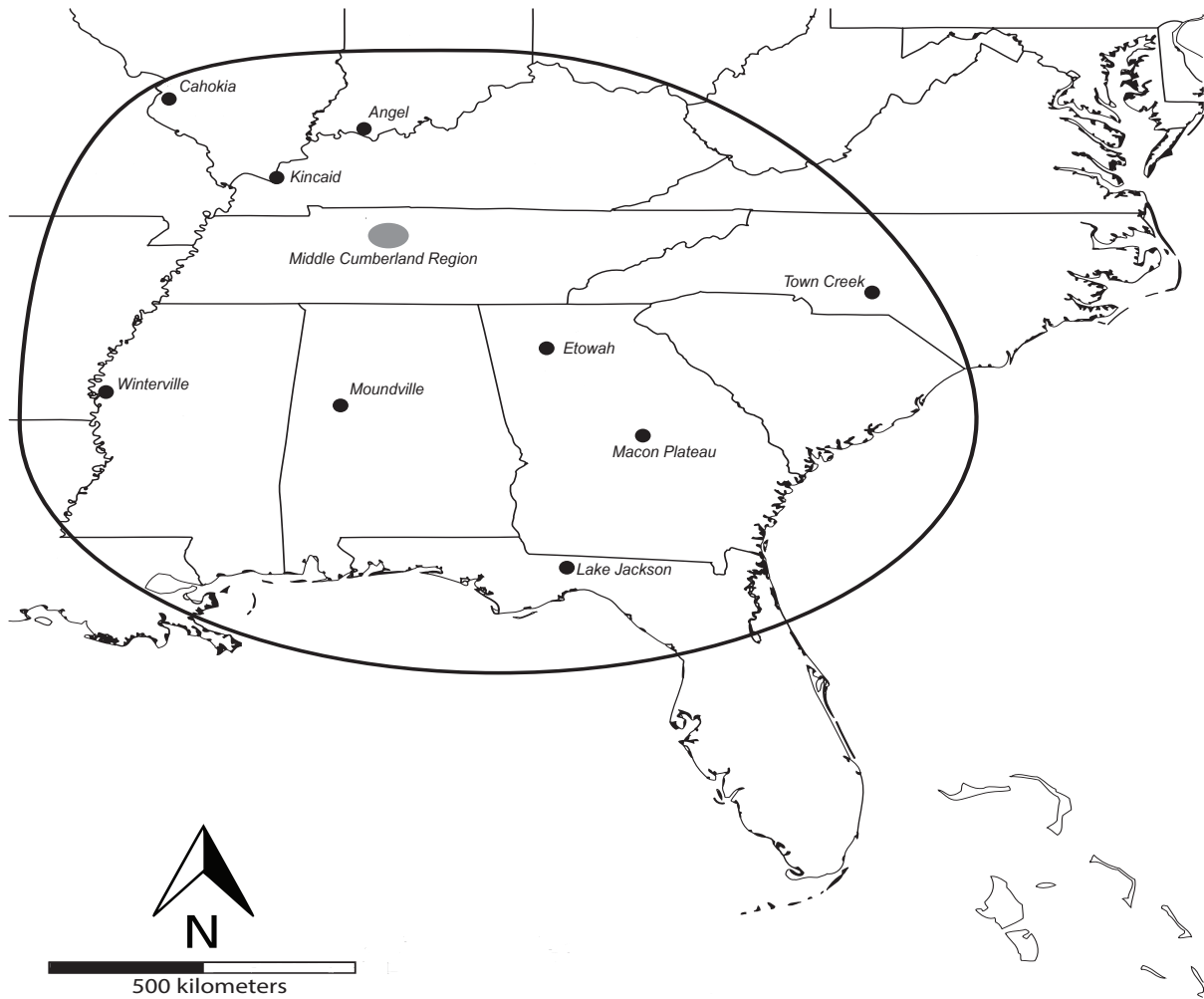


Fig. 1. Areal extent of Mississippian phenomenon, with locations of some of the major mound centers and the Middle Cumberland Region. Digitizing: Charles Cobb.

around 1300 CE, characterized by an upsurge in nucleated towns surrounded by wooden palisades (Anderson 1994b, 136–37; Brose 1989, 29; Milner 1999; Morse and Morse 1983, 283).

There is widespread evidence at Mississippian sites for violence from projectiles (primarily the bow and arrow) and blunt force trauma from direct combat (Bridges et al. 2000; Milner et al. 1991; Smith 2003; Steadman 2008). Still, there is considerable variability in trauma as well as in infectious diseases. Skeletal samples from sites in west-central Illinois display moderate to high levels of violence attributable to conflict, and a range of stressors linked to dietary stress (Cook 1984; Steadman 2008). The occurrence of several

cases of tuberculosis at the peak of Moundville (ca. 1250–1400 CE), one of the largest Mississippian centers, indicates that a sedentary and nucleated lifestyle inside and around the palisades was beginning to take a toll on health (Powell 2000). Interestingly, the skeletal evidence for warfare in the Moundville skeletons is almost nil (Powell 1988; Schoeninger et al. 2000), perhaps because of its intimidating size (Bridges et al. 2000). These varying patterns affirm the implications of the osteological paradox that disease is not a necessary consequence of agriculture, nucleation, and warfare; this correlation must be demonstrated rather than assumed.

In a recent study of Mississippian settlements in the Central Illinois River Valley (CIRV),

VanDerwarker and Wilson (2016) argue that they have an example where regional conflict had a major impact on subsistence patterns, thus creating an atmosphere of structural violence. As with many other Mississippian regions, concerns over defense in the CIRV were expressed in a widespread pattern of fortifications. In addition, several of the villages were catastrophically burned. In a detailed paleobotanical analysis from four of the sites, VanDerwarker and Wilson found clear evidence for a marked decrease in wild plant abundance that they believe “likely reflects a broader pattern of declining dietary diversity” (VanDerwarker and Wilson 2016, 89). Likewise, there was a decline in fish remains. They attribute these patterns to a decrease in the normal foraging range for wild resources because of concerns of the population with traveling too far from the safety of their communities.

In a brief bioarchaeological study, we have made similar arguments regarding structural violence, warfare, and health for the Middle Cumberland Region (MCR) of central Tennessee (Cobb and Steadman 2011) (Fig. 1). We expand upon that study here. There are 25–30 towns with earthen mounds and hundreds of smaller sites identified in the MCR, an area spanning about 70 km east-west and 50 km north south. Although these are not all necessarily contemporaneous, the region still appears to have been one of the more densely populated Mississippian regions at its peak in the 1200s and 1300s CE. Importantly, by the 1300s fortified settlements were ubiquitous (Jolley 1983; Smith 1992).

Our research involved an osteological analysis of over 1600 individuals from 13 Mississippian sites in the MCR. The overall frequency of trauma likely related to inter-group conflict is 5.4 percent (Worne et al. 2012). This is drawn from a sample of 870 individuals for whom over 25 percent of the skull was complete, and that showed evidence for scalp marks, sharp and blunt force trauma to the head and body,

Site Name	Porotic Lesion %	Linear Enamel Hypoplasia %
Cain's	0.15	0.13
Fisher	0.25	0.17
Mound Bottom	0.08	0.25
Fewkes	0.15	0.53
Gordontown	0.19	0.36
Bowling	0.32	0.48
Arnold	0.21	0.23
Jarman	0.31	0.4
Ganier	0.67	0.12
Averbuch	0.28	0.52
Sellars	0.06	0.43
Moss Wright	0.11	0.28
Rutherford	0.4	0.28

Tab. 1. Percentage of skeletal sample exhibiting porotic lesions and linear enamel hypoplasia.

and even projectile points embedded in bone. Given the difficulties of comparative analysis with other regions because of different approaches toward recording and reporting on skeletal trauma, it is difficult to estimate statistically whether the MCR reflects an inordinately high degree of conflict. It is important to bear in mind, however, that these signatures of trauma are limited to the surviving hard tissue. Evidence for wounds related to violence would be considerably higher had the soft tissue survived. At the least, the bioarchaeological data suggest that conflict was widespread in the MCR. This, combined with the ubiquity of fortified sites in the region, indicates concern with violence likely was an everyday matter and that conditions favored staying close to one's village as much as possible – much the same atmosphere that seems to have prevailed in the Central Illinois River Valley.

It is admittedly difficult to draw a straight line between a topography of conflict and an environment of epidemiological risk. Nonetheless, some of the general patterns of disease and stress in the MCR are instructive.

Evidence for non-infectious diseases commonly attributed to dietary deficiencies, notably porotic lesions and linear enamel hypoplasia (LEH), were pervasive in our skeletal samples (**Tab. 1**). The horizontal grooves in teeth that define LEH indicate intervals when the tooth stopped growing due to a severe episode of nutritional stress. This condition was common at all sites in our sample, and notably high at several (Jarman, Bowling, Sellars, Fewkes, Averbuch). Porotic lesions can be attributed to a number of causes, ranging from protein deprivation to vitamin C Deficiency. Although generally lower in prevalence than LEH throughout the MCR, it was still common at all sites and markedly high at villages like Ganier and Rutherford. In addition, infectious diseases like tuberculosis ($n=5$ sites) and treponematosi s ($n=4$ sites) were documented at several sites. As with trauma attributable to violence, infectious disease and poor nutrition are much more likely to be manifested in soft tissue than in bone. Thus it is probably safe to conclude that the prevalence of maladies that

could potentially be linked to food insecurity and crowding was well above that exhibited by the bioarchaeological data based on bone.

Although these patterns hint at the inter-correlation of sedentism, warfare, and disease, they are coarse-grained characterizations. To provide a finer perspective on our research we turn to a more detailed examination of the Averbuch site. This is a Mississippian town in our sample of 13 sites where archaeological investigations in the 1970s in advance of a rapidly encroaching housing development yielded a sample of 886 burials – most of them occurring in three separate cemeteries (**Fig. 2**).

Our Bayesian analysis of 18 radiometric dates from Averbuch provides intriguing insights on the evolution of the town (Cobb et al. 2015). It seems to have been established sometime in the 1300s CE as a generalized cluster of residential structures and a large cemetery. Then, in the 1400s a wooden palisade was

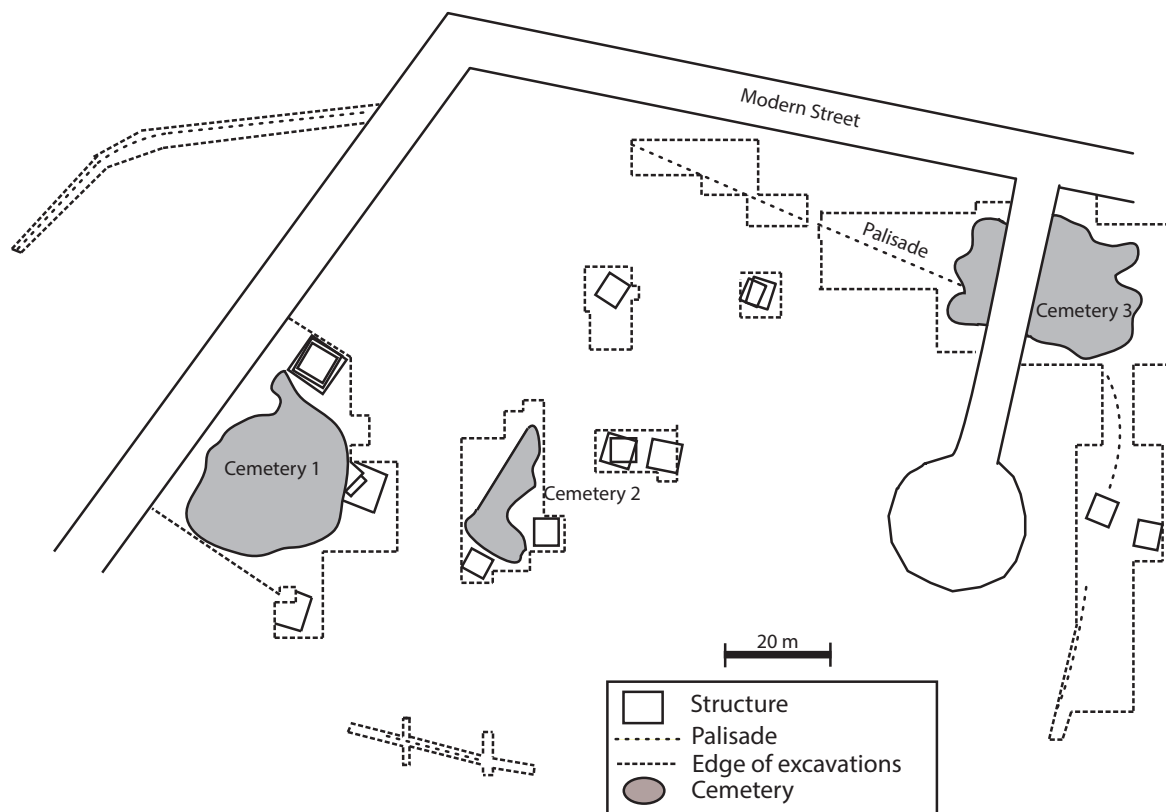


Fig. 2. Plan view of the Averbuch site, Tennessee, USA. Digitizing: Charles Cobb.

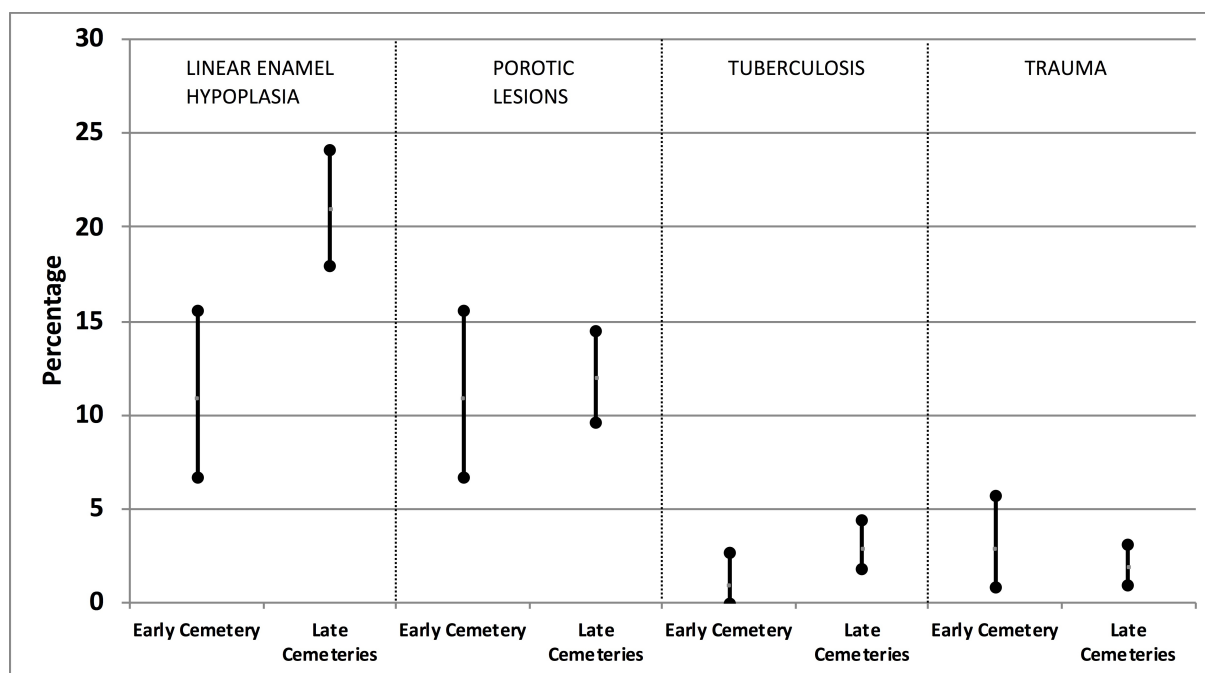


Fig. 3. Temporal trends in pathologies at the Averbuch sites, displayed in non-parametric confidence intervals.

erected around the town while residences and cemetery activities retreated within. We also have been able to sequence the three cemeteries at Averbuch. Based on our analysis of radiometric dates from cemeteries 1 and 3, and inferences drawn from diagnostic pottery from cemetery 2, cemetery 3 was established in the 1300s whereas cemeteries 1 and 2 were established in the 1400s.

Through the temporal ordering of the cemeteries, we are able to grossly track trends through time for conflict-related trauma, linear enamel hypoplasia, porotic lesions, and tuberculosis (Fig. 3). Drawing our comparisons with non-parametric confidence intervals, the one distinctive trend is the apparent surge in problems with gaining adequate nutrition between the 1300s and 1400s, as reflected in the spike in cases of enamel hypoplasia. The other trends seem relatively stable, although there is a slight uptick in the incidence of tuberculosis. However, considerations of the osteological paradox still mean that we cannot take all of these patterns at face value. In a regional bioarchaeological study of health and demographic trends in the MCR, Fojas (2016) did find that mortality was elevated

in the latter part of the Mississippian period. But this trend did not strictly correlate with all skeletal signatures for adverse health. For example, individuals with LEH tended to have longer life spans whereas those displaying porotic lesions had shorter ones. A key point with the osteological paradox, however, is that it focuses on differential survivorship. If one considers the prevalence of morbidity as a marker for what we would refer to today as quality of life, then there is a broad and distinct decline in health in the MCR from early to late Mississippian times.

In light of this evidence, it is interesting that the analyst who analyzed the botanical remains from Averbuch expressed surprise at the extremely high focus on maize on the site, and the relative paucity of other plants except for hickory nuts (Crites 1984). It is noteworthy that this evidence dovetails with a bone isotope analysis of several Mississippian skeletal samples from the Middle Cumberland region, including four individuals from Averbuch (Buikstra et al. 1988). That study concluded that there was a shift to maize dependence in the MCR that was “rapid and extreme” compared to a number of major

sites in the Central Mississippi Valley to the west (Buikstra et al. 1988, 248). Although this process has often been viewed in terms of the pressures of population growth, we hypothesize that the dramatic turn to maize may have been related in part to the upsurge in violence in the 1300s. Similar to the pattern found in the Central Illinois River Valley, communities may have concentrated their subsistence to maize fields outside the immediate confines of their walls as concerns with travel away from the town increased. This decision may have come at the expense of greatly narrowing the diet breadth of Averbuch in addition to increasing dependence on a staple subject to the whims of rainfall. The limited representation of edible plant species at Averbuch is a stark contrast to the typical Mississippian diet elsewhere in the larger Mississippian region, which usually displays a wide variety of other cultigens as well as numerous wild species.

It is also noteworthy that the level of violence appears to be stable at Averbuch from the 1300s to the 1400s. Given that the surrounding palisade was built in the 1400s, it very well might have offered a measure of greater protection even if conflict in the region were increasing. Nevertheless, despite the stability in trauma rates through time, women seem to have been increasingly at risk (Fig. 4). There were no female victims of violence in Cemetery 3, the early cemetery. Later in time women seem to have been equally vulnerable to violence as men, as reflected in Cemetery 1. This may suggest that conflict was encroaching spatially on Averbuch such that all portions of the population may have been more at risk even within the shadow of the palisade wall (Vidoli and Worne 2018).

Overall, the reduced diet breadth, along with other stressors, seems to have had a major adverse effect on the health of the community:

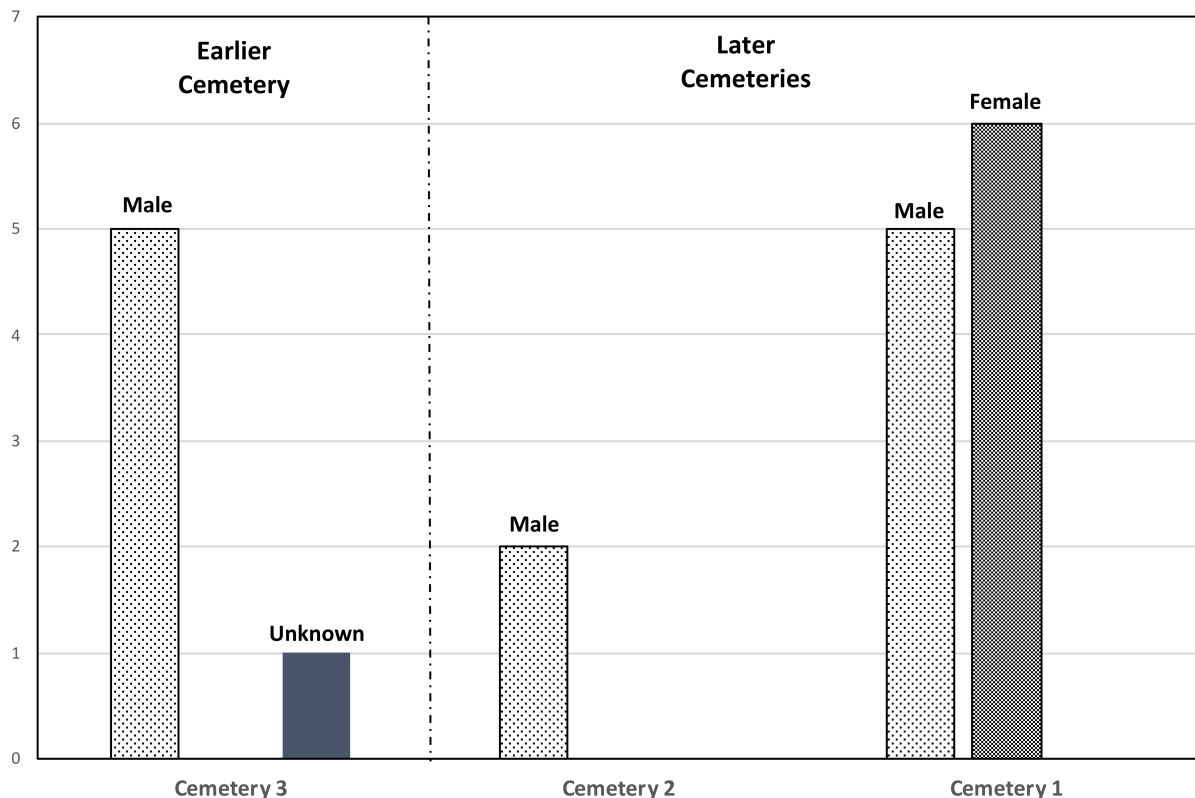


Fig. 4. Temporal trends in sex-linked trauma at the Averbuch site.

the relative percentages of linear enamel hypoplasia and porotic hyperostosis are among the highest in the MCR. Also, Averbuch is one of the few sites in the region with cases of both tuberculosis and trepanomatosi. We think we can safely conclude that the inhabitants of Averbuch were truly sick of war.

The Material and Sensual Dimensions of Conflict

When we consider the contingencies of history, other factors both large and small play an important role in how warfare may intersect with agricultural and epidemiological transitions. It is now well documented that a major series of multi-decadal droughts began to plague eastern North America beginning in the late 1200s and lasting well into the 1400s (Meeks and Anderson 2013). A corresponding deterioration in a climate favorable to agriculture seems to have been a major factor, if not the only one, in a widespread abandonment in the 1400s by Mississippian communities of a very large section of the American mid-west and southeast (Cobb and Butler 2002; Meeks and Anderson 2013; Williams 1990). The MCR was part of this phenomenon, and unstable food stores and conflict were likely some of the consequences of the droughts that may have ultimately led to the massive depopulation.

Noticeably missing from our study are the more experiential dimensions of life during wartime. As Pollock (2016) maintains, while human suffering occurs in all times and places, it is a topic only occasionally addressed by archaeologists – especially in pre-modern contexts. The outcome of structural violence is, by definition, suffering. Yet rarely do we get intimate analyses of the impacts of endemic conflict on the everyday lives of ordinary people from the material record. Granted, this is not easy to do. How do we, as archaeologists, elicit from the material record the stress, anxiety, and terror of people held captive to chronic warfare?

While this aspect has not been a focus of this study, there are elements of the archaeological record that suggest the tensions that must have been experienced by populations in the MCR during a period of volatility marked by conflict, climatic change, and food insecurity. Our study of the intrasite chronology of Averbuch shows that the palisade built in the 15th century runs across the first-built cemetery as well as the location of several houses (Fig. 2). Given the relatively short and presumably continuous occupation of Averbuch (ca. 100–150 years), it is unlikely that residents had forgotten the location of the burial place – especially since most of the burials were placed in stone “boxes,” or crypts, in shallow contexts. The materiality of the palisade can be read in two, complementary ways. First, and more obviously, it is a defensive work. Second, its erection over a presumed sacred place is a manifestation of haste and anxiety. It so happens that a near-identical event is recorded at Gordontown, a mound site in the MCR contemporary with Averbuch. These hurried constructions over burial places suggest that an atmosphere of volatility was rapidly overtaking the MCR in the 1400s CE. This notion is further supported by the fact that we have recently obtained 15th-century dates for palisade construction at two other sites in the MCR, Sellars and Brentwood Library (Krus and Cobb 2018).

Another proxy for the anxiety likely experienced by residents of the MCR is heightened population movement. A bio-distance study based on morphological traits of the skeletal samples from our original sample of 16 study sites has shown that migration within the MCR appears to have increased through time, corresponding with the rise in warfare (Vidoli 2012; Vidoli and Worne 2018). This pattern, combined with the epidemiological data from Averbuch, suggests a dual component to mobility during times of conflict. On the one hand, on an everyday basis people may have greatly circumscribed their movement from the protected confines

of their villages; on the other hand, if living in these communities became increasingly untenable because of constant attacks, they may have eventually been deserted for the safety of nearby allied communities.

A focus on structural violence does run the risk of eliding the ways in which a community was successfully persisting. Although the bioarchaeological data from the MCR reflect a population greatly exposed to physical and epidemiological risk, many aspects of what we consider to be a traditional Mississippian lifeway continued unabated. In particular, the impressive assemblage of mortuary artifacts at Averbuch (including engraved shell gorgets, effigy vessels, and worked bone ornaments) reflects a population deeply dedicated to sustaining their spiritual traditions and to producing impressively crafted objects to accompany their loved ones to the afterlife.

Conclusion

The role of conflict is only beginning to be systematically incorporated into studies of earlier epidemiological transitions. Warfare embodies a number of decisions that greatly impact the built environment and cultural landscape of towns and polities. Settlement nucleation, enclosures, and the clustering of allied communities become ways of cultural emplacement that reduce violent confrontations and promote group safety. At the same time, these strategies paradoxically also promote thresholds of crowding and reduced mobility that may encourage disease. Fear of movement may also curtail access to foodstuffs and basic resources. These are

the conditions that foster epidemiological transitions as a variant of structural violence if they occur over a sufficiently wide area, and are sustained for a sufficiently long time.

We believe that considering social and bodily expressions that span human suffering to celebratory communal rites is essential for completing the circle on studies of violence and sickness. Research on structural violence must address the everyday, concrete behaviors that may, over the long run, lead to the establishment of traditions of landscape and emplacement that, in turn, propagate marginalization and health inequalities. To be truly holistic, interrogations of structural violence must consider how conflict and disease are mediated through culture and incorporated into the ideologies of everyday life.

Acknowledgments

Portions of this research were funded by the National Science Foundation (BCS-0852686) and the Wenner Gren Foundation (Grant No. 8477). Our gratitude is extended to various individuals at the Archaeological Research Laboratory at the University of Tennessee who facilitated our access to the Averbuch collections, and to both Mike Moore at the Tennessee Division of Archaeology and Kevin Smith at Middle Tennessee State University who have helped in countless ways with our research. Finally, we extend a major thanks to Susan Pollock for many years of friendship and scholarly exchange at our shared academic home of Binghamton University.

References

- Anderson, David G. 1994a. "Factional Competition and the Political Evolution of Mississippian Chiefdoms in the Southeastern United States." In *Factional Competition in the New World*, edited by Elizabeth M. Brumfiel and John W. Fox, 61–76. Cambridge, UK: Cambridge University Press. DOI: [10.1017/CBO9780511598401.007](https://doi.org/10.1017/CBO9780511598401.007).
- Anderson, David G. 1994b. *The Savannah River Chiefdoms: Political Change in the Late Prehistoric Southeast*. Tuscaloosa: The University of Alabama Press.

- Baker, Brenda, and George J. Armelagos. 1988. "The Origin and Antiquity of Syphilis: Paleopathological Diagnosis and Interpretation." *Current Anthropology* 29 (5): 703–38. DOI: [10.1086/203691](https://doi.org/10.1086/203691).
- Barrett, Ronald, Christopher W. Kuzawa, Thomas McDade, and George J. Armelagos. 1998. "Emerging and Re-Emerging Infectious Diseases: The Third Epidemiologic Transition." *Annual Review of Anthropology* 27: 247–71. DOI: [10.1146/annurev.anthro.27.1.247](https://doi.org/10.1146/annurev.anthro.27.1.247).
- Bernbeck, Reinhard. 2008. "Structural Violence in Archaeology." In "Imperial Inspections: Archaeology, War and Violence," edited by Maria Theresia Starzmann, Susan Pollock, and Reinhard Bernbeck, special issue, *Archaeologies* 4 (3): 390–413. DOI: [10.1007/s11759-008-9076-6](https://doi.org/10.1007/s11759-008-9076-6).
- Blitz, John H. 2010. "New Perspectives in Mississippian Archaeology." *Journal of Archaeological Research* 18 (1): 1–39. DOI: [10.1007/s10814-009-9033-y](https://doi.org/10.1007/s10814-009-9033-y).
- Bridges, Patricia S., Keith P. Jacobi, and Mary Lucas Powell. 2000. "Warfare-Related Trauma in the Late Prehistory of Alabama." In *Bioarchaeological Studies of Life in the Age of Agriculture: A View from the Southeast*, edited by Patricia M. Lambert, 35–62. Tuscaloosa: The University of Alabama Press.
- Brose, David S. 1989. "From the Southeastern Ceremonial Complex to the Southern Cult: "You Can't Tell the Players Without a Program"." In *The Southeastern Ceremonial Complex: Artifacts and Analysis*, edited by Patricia Galloway, 27–37. Lincoln: University of Nebraska Press.
- Brown, James A. 1976. "The Southern Cult Reconsidered." *Midcontinental Journal of Archaeology* 1 (2): 115–35.
- Buikstra, Jane E., William Autrey, Emanuel Breitburg, Leslie Eisenberg, and Nikolaas Van Der Merwe. 1988. "Diet and Health in the Nashville Basin: Human Adaptation and Maize Agriculture in Middle Tennessee." In *Diet and Subsistence: Current Archaeological Perspectives. Proceedings of the Nineteenth Annual Conference of the Archaeological Association of the University of Calgary*, edited by Brenda V. Kennedy and Genevieve M. LeMoine, 243–59. Calgary: University of Calgary.
- Cobb, Charles R. 2003. "Mississippian Chiefdoms: How Complex?" *Annual Review of Anthropology* 32: 63–84. DOI: [10.1146/annurev.anthro.32.061002.093244](https://doi.org/10.1146/annurev.anthro.32.061002.093244).
- Cobb, Charles R., and Bretton Giles. 2009. "War is Shell: The Ideology and Embodiment of Mississippian Warfare." In *Warfare in Cultural Context: Practice, Agency, and the Archaeology of Violence*, edited by Axel Nielsen and William Walker, 84–108. Tucson: University of Arizona Press.
- Cobb, Charles R., and Dawnie W. Steadman. 2011. "Pre-Columbian Warfare and Indecorous Images in Southeastern North America." In *The Ethics of Anthropology and Amerindian Research: Reporting on Environmental Degradation and Warfare*, edited by Richard J. Chacon and Rubén G. Mendoza, 37–50. New York: Springer. DOI: [10.1007/978-1-4614-1065-2](https://doi.org/10.1007/978-1-4614-1065-2).
- Cobb, Charles R., Anthony M. Krus, and Dawnie W. Steadman. 2015. "Bayesian Modeling of the Occupation Span of the Averbuch Site in the Middle Cumberland Drainage, Tennessee." *Southeastern Archaeology* 34 (1): 6–56. DOI: [10.1179/2168472314Y.00000000005](https://doi.org/10.1179/2168472314Y.00000000005).
- Cobb, Charles R., and Brian M. Butler. 2002. "The Vacant Quarter Revisited: Late Mississippian Abandonment of the Lower Ohio Valley." *American Antiquity* 67: 625–41. DOI: [10.2307/1593795](https://doi.org/10.2307/1593795).
- Cohen, Mark N. 1989. *Health and the Rise of Civilization*. New Haven: Yale University Press.
- Cohen, Mark N., and George J. Armelagos, eds. 1984. *Paleopathology at the Origins of Agriculture*. Orlando: Academic Press.
- Cook, Della C. 1984. "Subsistence and Health in the Lower Illinois Valley: Osteological Evidence." In *Paleopathology at the Origins of Agriculture*, edited by Mark N. Cohen and George J. Armelagos, 235–69. Orlando: Academic Press.
- Crites, Gary D. 1984. "Late Mississippian Paleoethnobotany in the Nashville Basin: The Evidence from Averbuch." In *Averbuch: A Late Mississippian Manifestation in the Nashville Basin, Vol. 1, Observations*, edited by Walter E. Klippel and William M. Bass, 12.1–12.23. Report submitted to the National Park Service. Knoxville: Department of Anthropology, University of Tennessee.
- DePratter, Chester B. 1991. *Late Prehistoric and Early Historic Chiefdoms in the Southeastern United States*. New York: Garland.

- Dye, David H. 1995. "Feasting with the Enemy: Mississippian Warfare and Prestige Goods Circulation." In *Native American Interactions*, edited by Kenneth E. Sassaman and Michael S. Nassaney, 289–316. Knoxville: The University of Tennessee Press.
- Dye, David H. 2009. *War Paths, Peace Paths: An Archaeology of Cooperation and Conflict in Native Eastern North America*. New York: Altamira Press.
- Farmer, Paul. 2004. "An Anthropology of Structural Violence." *Current Anthropology* 45 (3): 305–25. DOI: [10.1086/382250](https://doi.org/10.1086/382250).
- Ferguson, R. Brian. 2006. "Archaeology, Cultural Anthropology, and the Origins and Intensifications of War." In *The Archaeology of Warfare: Prehistories of Raiding and Conquest*, edited by Elizabeth N. Arkush and Mark W. Allen, 469–523. Gainesville: University Press of Florida.
- Fojas, Christina Laiz. 2016. "Modeling Prehistoric Health in the Middle Cumberland Region of Tennessee: Mississippian Populations at the Threshold of Collapse." PhD diss., University of Tennessee, Knoxville.
- Galtung, Johan. 1969. "Violence, Peace, and Peace Research." *Journal of Peace Research* 6 (3): 167–91.
- Goring-Morris, Nigel, and Anna Belfer-Cohen. 2010. "'Great Expectations', or the Inevitable Collapse of the Early Neolithic in the Near East." In *Becoming Villagers: Comparing Early Village Societies*, edited by Matthew S. Bandy and Jake R. Fox, 62–77. Tucson: The University of Arizona Press.
- Holladay, A. James, and J. C. F. Poole. 1979. "Thucydides and the Plague of Athens." *The Classical Quarterly* 29 (2): 282–300. DOI: [10.1017/S0009838800035928](https://doi.org/10.1017/S0009838800035928).
- Jolley, Robert L. 1983. "Mississippian Adaptations to the Middle Cumberland Drainage of Central Tennessee." *Midcontinental Journal of Archaeology* 8 (1): 73–90.
- Knight, Vernon James Jr. 1986. "The Institutional Organization of Mississippian Religion." *American Antiquity* 51 (4): 675–87. DOI: [10.2307/280859](https://doi.org/10.2307/280859).
- Knight, Vernon James Jr., James A. Brown, and George E. Lankford. 2001. "On the Subject Matter of Southeastern Ceremonial Complex Art." *Southeastern Archaeology* 20 (2): 129–41.
- Krus, Anthony M. 2016. "The Timing of Precolumbian Militarization in the U.S. Midwest and Southeast." *American Antiquity* 81 (3): 375–88. DOI: [10.7183/0002-7316.81.2.375](https://doi.org/10.7183/0002-7316.81.2.375).
- Krus, Anthony M., and Charles R. Cobb. 2018. "The Mississippian Fin de Siècle in the Middle Cumberland Region of Tennessee." *American Antiquity* 83 (2): 302–19. DOI: [10.1017/aaq.2018.1](https://doi.org/10.1017/aaq.2018.1).
- Larsen, Clark Spencer. 2006. "The Agricultural Revolution as Environmental Catastrophe: Implications for Health and Lifestyle in the Holocene." *Quaternary International* 150 (1): 12–20. DOI: [10.1016/j.quaint.2006.01.004](https://doi.org/10.1016/j.quaint.2006.01.004).
- Meeks, Scott C., and David G. Anderson. 2013. "Drought, Subsistence Stress, and Population Dynamics: Assessing Mississippian Abandonment of the Vacant Quarter." In *Soils, Climate, and Society: Archaeological Investigations in Ancient America*, edited by John D. Wingard and Sue Eileen Hayes, 61–83. Boulder: University Press of Colorado.
- Milner, George R., Eve Anderson, and Virginia G. Smith. 1991. "Warfare in Late Prehistoric West-Central Illinois." *American Antiquity* 56: 581–603. DOI: [10.2307/281538](https://doi.org/10.2307/281538).
- Milner, George R. 1999. "Warfare in Prehistoric and Early Historic North America." *Journal of Archaeological Research* 7 (2): 105–51. DOI: [10.1007/BF02446275](https://doi.org/10.1007/BF02446275).
- Morse, Dan F., and Phyllis A. Morse. 1983. *Archaeology of the Central Mississippi Valley*. New York: Academic Press.
- Olson, James G. 1999. "Epidemic Typhus: A Forgotten but Lingering Threat." In *Emerging Infections* 3, edited by W. Scheld, W. Craig, and J. Hughes, 67–72. Washington DC: ASM Press. DOI: [10.1128/9781555818418.ch5](https://doi.org/10.1128/9781555818418.ch5).
- Pollock, Susan. 2016. "The Subject of Suffering." *American Anthropologist* 118 (4): 726–41. DOI: [10.1111/aman.12686](https://doi.org/10.1111/aman.12686).
- Powell, Mary Lucas. 1988. *Status and Health in Prehistory: A Case Study of the Moundville Chiefdom*. Washington D.C.: Smithsonian Institution Press.

- Powell, Mary Lucas. 2000. "Ancient Diseases, Modern Perspectives: Treponematosi and Tuberculosis in the Age of Agriculture." In *Bioarchaeological Studies of Life in the Age of Agriculture*, edited by Patricia M. Lambert, 6–34. Tuscaloosa: The University of Alabama Press.
- Price, James D. 1978. "The Settlement Pattern of the Powers Phase." In *Mississippian Settlement Patterns*, edited by Bruce D. Smith, 201–32. New York: Academic Press.
- Schoeninger, Margaret J., Lisa Sattenspiel, and Mark R. Schurr. 2000. "Transitions at Moundville: A Question of Collapse." In *Bioarchaeological Studies of Life in the Age of Agriculture: A View from the Southeast*, edited by Patricia M. Lambert, 63–77. Tuscaloosa: The University of Alabama Press.
- Smith, Kevin E. 1992. "The Middle Cumberland Region: Mississippian Archaeology in North Central Tennessee." PhD diss., Vanderbilt University.
- Smith, Maria O. 2003. "Beyond Palisades: The Nature and Frequency of Late Prehistoric Deliberate Violent Trauma in the Chickamauga Reservoir of East Tennessee." *American Journal of Physical Anthropology* 121 (4): 303–18. DOI: [10.1002/ajpa.10232](https://doi.org/10.1002/ajpa.10232).
- Steadman, Dawnie Wolfe. 2008. "Warfare Related Trauma at Orendorf, a Middle Mississippian Site in West-Central Illinois." *American Journal of Physical Anthropology* 136 (1): 51–64. DOI: [10.1002/ajpa.20778](https://doi.org/10.1002/ajpa.20778).
- VanDerwarker, Amber M., and Gregory D. Wilson. 2016. "War, Food, and Structural Violence in the Mississippian Central Illinois Valley." In *The Archaeology of Food and Warfare*, edited by Amber M. VanDerwarker and Gregory D. Wilson, 75–105. New York: Springer. DOI: [10.1007/978-3-319-18506-4_5](https://doi.org/10.1007/978-3-319-18506-4_5).
- Vidoli, Giovanna M. 2012. "Shifting Borders: Population Movement and the Geopolitical Landscape of the Middle Cumberland Region during the Mississippian Period." PhD diss., Binghamton University.
- Vidoli, Giovanna M., and Heather Worne. 2018. "Relationships and Trauma: Lived Perspectives at Averbuch." *Tennessee Archaeology* 9 (2): 156–69.
- Williams, Stephen. 1990. "The Vacant Quarter and Other Late Events in the Lower Valley." In *Towns and Temples Along the Mississippi*, edited by David H. Dye and Cheryl Anne Cox, 170–80. Tuscaloosa, AL: The University of Alabama Press. DOI: [10.2307/1593795](https://doi.org/10.2307/1593795).
- Wilson, Gregory D., ed. 2017. *Mississippian Beginnings*. Gainesville: University of Florida Press.
- Wood, James W., George R. Milner, Henry C. Harpending, and Kenneth M. Weiss. 1992. "The Osteological Paradox: Problems of Inferring Prehistoric Health from Skeletal Samples." *Current Anthropology* 33 (4): 343–70. DOI: [10.1086/204084](https://doi.org/10.1086/204084).
- Worne, Heather, Charles R. Cobb, Giovanna Vidoli, and Dawnie Steadman. 2012. "The Space of War: Connecting Geophysical Landscapes with Skeletal Evidence of Warfare-Related Trauma." In *The Bioarchaeology of Violence*, edited by Debra L. Martin, Ryan P. Harrod, and Ventura R. Perez, 141–59. Gainesville: University of Florida Press.
- Zuckerman, Molly Kathleen, Kristin Nicole Harper, Ronald Barrett, and George John Armelagos. 2014. "The Evolution of Disease: Anthropological Perspectives on Epidemiologic Transitions." *Global Health Action* 7:1, 23303. DOI: [10.3402/gha.v7.23303](https://doi.org/10.3402/gha.v7.23303).