THE BIOLOGICAL CONSEQUENCES OF URBANIZATION IN MEDIEVAL POLAND

DISSERTATION

Presented in Partial Fulfillment of the Requirements for

the Degree of Doctor of Philosophy in the

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By

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ABSTRACT

This dissertation tests the hypothesis that urbanization in a medieval Polish population caused the general quality of life to decline. Furthermore, it will test the hypothesis that these consequences of urbanization occurred gradually and were not severe. These hypotheses are tested by documentation of stress indicators, specific infectious diseases, dietary indicators, and traumatic injuries. As a corollary, I document workload as an indicator of lifestyle.

To test these hypotheses, three medieval Polish skeletal samples are used, representing the three temporal periods of interest: pre-urbanization (A.D. 950-1025), early urbanization (A.D. 1025-1100), and late urbanization (A.D. 1100-1250). The prevalence of stress indicators (porotic hyperostosis, cribra orbitalia, enamel hypoplasias, and periostitis) and specific infectious diseases (leprosy, treponematosis, and tuberculosis) are compared among the three temporal groups to determine whether health declined. In addition, the average adult stature is temporally compared, as stature reflects overall health. The prevalence, pattern and severity of DJD are also compared among the three temporal groups in order to identify changes in activity patterns. Temporal comparisons of prevalence, severity, and pattern of dental pathological conditions (dental caries, antemortem tooth loss, periapical lesions, dental calculus, and dental wear) are

used to assess changes in diet. Finally, the prevalence of traumatic injuries are compared among the three temporal groups to determine whether interpersonal violence increased.

The results of this study indicate that health declined mildly, during the more than 200 years of urbanization represented by this sample. In addition, there is a change in activity patterns and diet. However, there is no change in rates of interpersonal violence. These results have important implications for urbanization studies, as they emphasize the need to take rate of change and severity into consideration when assessing the consequences of urbanization.

Dedicated to my parents, Gary and Judith,
and to James.

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FIELDS OF STUDY

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LIST OF ABBREVIATIONS

Full Name	Abbreviation
Age: birth - 5 years	C1
Age: 5 – 10 years	C2
Age: 10 – 15 years	C3
Age: 15 – 20 years	C4
Age: child, unknown age	C
Age: 20 – 35 years	YA
Age: 35 – 50 years	MA
Age: 50+ years	OA
Age: adult, unknown age	A
Age: indeterminate	U
Antemortem tooth loss	ATL
Cervical vertebra	CERV VERT
Clavicle	CLAV
Cribra orbitalia	CO
Degenerative joint disease	DJD
Enamel hypoplasia	EH
Femur	FEM
Fibula	FIB

First molar……………………………………………………………………………M1

Humerus………………………………………………………………………………HUM

Left (dental wear, periostitis, DJD)…………………………………………………L

Lumbar vertebra………………………………………………………………LUM VERT

Mandibular canine……………………………………………………….....MAND CAN

Mandibular incisor……………………………………………………………MAND INC

Maxillary canine…………………………………………………………….MAX CAN

Maxillary incisor…………………………………………………………....MAX INC

Nasopharyngeal lesion………………………………………………..NASAL LESION

Periostitis……………………………………………………………………PERIO

Porotic hyperostosis………………………………………………………………..PH

Radius………………………………………………………………………………RAD

Right (dental wear, periostitis, DJD)………………………………………………..R

Second molar…………………………………………………………………………M2

Sex: female…………………………………………………………………………..F

Sex: male………………………………………………………………………………M

Sex: indeterminate…………………………………………………………………..U

Temporomandibular joint……………………………………………………….....TMJ

Thoracic vertebra……………………………………………………………THOR VERT

Tibia……………………………………………………………………………………TIB

Time period: pre-urbanization…………………………………………………………PRE

Time period: early urbanization……………………………………………………….URB

Time period: late urbanization……………………………………………………….POST

Time period: indeterminate……………………………………………………………U

Trauma – cranial……………………………………………………..TRAUMA-CRAN

Treponemal lesion, caries sicca…………………………………………TREP LESION

Tuberculosis………………………………………………………………………..TB

Unknown……………………………………………………………………...UNK

Vertebrae…………………………………………………………………...VERTS

CHAPTER 1

INTRODUCTION

Purpose

The purpose of this dissertation is twofold: (1) to examine the question of whether urbanization affects the health, diet, activity patterns, and interpersonal violence of a population, and (2) to investigate the nature of this impact. A bioarchaeological analysis of human skeletal samples was conducted in order to test the hypothesis that urbanization caused a decline in quality of life. Furthermore, this study tests the hypothesis that these changes occurred gradually and were not severe. Human skeletal remains from four medieval Polish collections are utilized in this study, as they represent pre- and late urbanization populations.

The question addressed in this paper is part of a larger body of work investigating the effects of urbanization on populations living all over the world at different times throughout history. Urbanization is one of the most significant changes in the history of human settlement, and many studies focus on the fundamental questions of why people migrated to large, more densely populated settlements and why they remained there despite negative consequences. Although previous research indicates that urbanization negatively impacts the health of populations (e.g., Storey, 1992; Pearson et al., 1993; Matalas et al., 1999; Lewis, 2002; Khumalo, 2004), the continuing trend of urbanization suggests that there are advantages to living in an urban environment that compensate for the detrimental effects. This study addresses whether negative health effects, if any, occurred gradually or more rapidly. In other words, if a health decline was gradual and/or it leveled off quickly, it may not have been a factor in the persistence of the urbanization trend. This paper contributes to the theoretical context of urbanization studies by assessing the prevalence of skeletal indicators of health over time, which will enable short-term and long-term impacts to be evaluated and to determine whether these impacts were severe or moderate and whether they occurred at a gradual or rapid rate.

Previous studies have investigated the effects of urbanization in historical (e.g., Steckel, 1994; Pivovarov, 2003) and contemporary settings (e.g. Schell, 1991; Pearson et al., 1993; Matalas et al., 1999; Dufour and Piperata, 2004; Falola and Salm, 2004) and have found that urbanization negatively affects populations in terms of growth, physiological stress, disease, and overall health. Bioarchaeological studies (e.g., Storey, 1992; Lewis, 2002; Marquez Morfin et al., 2002; Storey et al., 2002) demonstrate that markers of stress and deprivation have a higher prevalence in samples representing urban populations than from samples from non-urban populations. However, none of these studies explicitly examines the question of why urbanization persisted despite these detrimental health consequences. This dissertation seeks to answer that question.

Expected Outcomes

Based on earlier studies (e.g., Storey, 1992; Lewis, 2002; Marquez Morfin et al., 2002; Storey et al., 2002), it is expected that health will decline over time; however, this decline will occur gradually and it will not be severe. Such a mild, gradual decline may not have been perceptible by the population. As a result, it would not have prevented individuals from choosing to move to urban centers. Urbanization, then, persisted despite the negative health consequences. In other words, it took so many years for health to be negatively affected that people did not realize the population as a whole was experiencing an overall decline in health. Since life expectancy at birth was approximately 40 years of age and many did not live beyond 60 years or so (Singman, 1999), the collective memory of how healthy the population was a generation or two before may simply not have been present. Furthermore, it is expected that there will be a temporal increase in interpersonal violence, but it will be more rapid than the decline in health. Activity patterns should change over time as individuals shift from agricultural-based pursuits to craft specialization. It is also expected that the diet of the population will remain temporally consistent as the population continued to consume similar foods.

Organization of Dissertation

This dissertation is divided into nine chapters. Chapter Two addresses the biocultural context of this study in terms of the political and religious changes that were occurring in medieval Poland, providing the necessary background for the questions addressed by this paper. In addition, this chapter defines urbanization and urban centers, examines the process of urbanization, and reviews previous urbanization studies. Lastly, the four main hypotheses of this dissertation are presented. Chapter Three describes the materials and methods used to test the hypotheses, including descriptions of the skeletal markers and pathological conditions documented in this study. In addition, the scoring rubrics and statistical analyses are described. Chapter Four provides the results of the statistical analyses, and Chapters Five and Six discuss the results and give the conclusions of this study.

CHAPTER 2

BIOCULTURAL CONTEXT OF URBANIZATION IN MEDIEVAL POLAND

In order to investigate the impact of urbanization on the health and lifestyle of populations living in medieval Poland, it is essential to understand the biocultural context in which urbanization was taking place as well as the process of urbanization itself. During the medieval period, Poland was in a state of flux, as many changes were occurring politically and socially. These factors influenced and led to the urbanization trend, which in turn, likely affected the health and well-being of the population. Urban centers possess a combination of advantages and disadvantages; on the one hand, living in an urban area generally affords greater economic opportunities (Clark, 2003), while on the other hand, there are many chronic problems that can affect health and lifestyle (McGrath, 1992; Storey, 1992). These chronic problems form the basis of this dissertation, as I seek to assess whether these problems led to a decline in health and a shift in lifestyle. This chapter describes the political and social context of Poland in the medieval period, the process of urbanization, and the effects of urbanization on the health and lifestyle of other historical and contemporary populations. Lastly, based on the biocultural context, I put forth four main hypotheses to be tested by this study.

Urban Centers

An urban environment is typically defined by its population size, economic features, social complexity, and social services provided by the ruling class or government (Lewis, 2002). In this study, a settlement is classified as urban if it has a large, dense population engaged in craft specialization, with a range of political and administrative services provided to the inhabitants of the city. In conjunction with the economic opportunities afforded by urban centers due to the large population size and the demand for goods produced through craft specialization, there are a number of disadvantages for the population. The sedentary and densely populated nature of an urban setting may be problematic in terms of poor sanitation, accumulation of garbage and waste, and pollution of the water supply (McGrath, 1992; Storey, 1992). These negative aspects of urban living may lead to a number of health problems, including higher rates of infectious disease and parasitism. A sedentary, dense population is ideal for the spread of communicable or "crowd" diseases, and a polluted water supply may serve as a pathway for infectious pathogens to reach their hosts (Cohen, 1989; Armelagos, 1990; Inhorn and Brown, 1990; McGrath, 1992; Storey, 1992). When combined with malnutrition, disease and parasitism have a synergistic effect, compounding health problems (Scrimshaw, 1975; Scrimshaw et al., 1968).

Increased population density and sedentism are not unique to urbanization, however, as these factors have also been proposed to contribute to a decline in health that occurred in conjunction with the introduction of agriculture (Cohen and Armelagos, 1984; Buikstra, 1992; Katzenberg, 1992; Larsen, 1995). Many bioarchaeological studies have investigated the biological consequences of the shift from foraging to agriculture in historical and prehistoric settings. Analysis of a variety of skeletal markers and pathological conditions have provided insight into the decline in health, including studies of infectious disease and stress markers (Lallo et al., 1977; Cassidy, 1984; Cook, 1984; Rose et al., 1984; Hutchinson and Larsen, 1988, 1990; Powell, 1988, 1991; Rose et al., 1991; Katzenberg, 1992; Pfeiffer and Fairgrieve, 1994; Stodder, 1994; Larsen, 1998; Larsen and Sering, 2000). Results of these studies demonstrate that the problems associated with greater population density and sedentism are often important factors in compromised health, as higher levels of infectious disease and greater prevalence rates of stress markers are found in large, sedentary populations than in smaller, more mobile groups. Although inter- and intra-population variation exists in health status after the introduction of agriculture, this variation is likely due to the influence of local environmental conditions and cultural differences (Larsen, 1995).

Since urbanization is characterized by increased population density and sedentism (Cohen, 1989; McGrath, 1992; Lewis, 2002), the problems observed in agriculturalists may be expected to intensify in populations living in urban settings. These features also characterize medieval Poland, as the urbanization trend took hold and increased during this period (Gieysztor et al., 1968). Urban centers were established and the population size steadily increased as more people were drawn to the cities, creating crowded living conditions. The problems associated with increased population density and sedentism are expected to have occurred in medieval Poland as well, with a greater accumulation of garbage and waste leading to pollution of the water supply and increased pathogen load.

In order to understand the persistence of urbanization in medieval Poland despite the potential negative health consequences, it is necessary to examine the process of urbanization and the factors that lead to its establishment.

Process of Urbanization

Urbanization is the process of small settlements or rural areas becoming a city with increases in population size as people migrate to the burgeoning city. Additionally, urbanization involves the acquisition of urban features, such as the development of political and social infrastructure (Adejugbe, 2004). Urbanization reflects a change in the distribution of people across a landscape, from a spread-out pattern that is characteristic of rural or agricultural settings to one in which people are concentrated in smaller areas, including cities or other urban centers (Clark, 2003). In any given geographic location, this shift marks the transition from a wholly rural population, to one that is partly rural and partly urbanized. In the world today, we appear to be transitioning from a once purely rural and agricultural world to one that may eventually be entirely urbanized (Clark, 2003).

The process of urbanization can be viewed as both a demographic and a structural process (Badru, 2004). The demographic process involves increasing population size and density, while the structural aspect refers to economic changes. The latter is the subject of some contention in modern urbanization studies as researchers question whether urbanization is the outcome of economic development or the instigator of a changing economic environment (Badru, 2004). In medieval Poland, research suggests that the initial aggregation of people in the castle-towns began a cycle of increased economic opportunity leading to an even greater concentration of people. As more people migrated to the cities, a greater demand for consumer products and goods resulted, which attracted even more people who wished to seize the economic opportunities that were available (Gieysztor et al., 1968).

A predominant question in contemporary urbanization studies focuses on why urbanization occurs at all. What forces are at work to cause people to agglomerate in much smaller areas? Researchers assert that overall, urban settlements offer a number of advantages and benefits over that of rural settlements (Clark, 2003). Two major viewpoints offer insight into these advantages and benefits. The first provides an economic interpretation of urban formation and urbanization. In historical settings, a population began to concentrate in a smaller geographic area when there was an ample food supply and an annual surplus. Since there was more than enough food to feed the population of a given area, not everyone needed to participate in agriculture. A portion of the population was freed up, in effect, to pursue other activities, such as those in craft specialization. Those involved in non-agricultural pursuits traded their services or non-food products for food. This interpretation suggests then, that a surplus of food is the foundation for urban formation and urbanization. The development of cities, therefore, is constrained to areas of surplus food production (Clark, 2003).

The economic explanation of urbanization goes on to suggest that the continuation of a city or urban center was fully dependent on the sustained food production in the surrounding rural areas. Without the source of food and raw materials for craft production, a city could not thrive. A basic “import-export” system was at the heart of a city’s economy (Clark, 2003). The goods and services provided within an urban center were exported to those in rural settlements in exchange for the food and raw materials that were then imported to the city. In addition, the population living in the city created a demand for non-food goods and services as well. This demand produced additional economic opportunities for those not engaged in agriculture (Clark, 2003). In this way, a delicate balance was achieved, in which rural settlements were every bit as important to the sustainability of a city as the city itself.

However, some researchers assert that while urbanization is primarily related to economics, it is a “push” phenomenon rather than a “pull.” In other words, people migrate to cities not because there is a surplus of agricultural goods, but because there are rural land shortages, few or no export crops, and severe economic hardships. People are, effectively, pushed to leave their rural homes in order to find better economic opportunities in urban centers (Nwanna, 2004).

The second interpretation suggests a social foundation to urbanization, as urban centers were established in a variety of geographic areas and cultures around the world (Clark, 2003). As such, the formation of a city was the result of interpersonal relationships that promoted population concentration. By converging in a specified area, there were benefits of security, defense, assistance, and social interactions. Such advantages attracted a greater number of people to accumulate in the given location, thereby increasing community benefits. Given substantial time and population growth, other advantages were established through the formation of governmental and administrative authorities that saw to the needs of an ever-growing population. Social institutions, such as political, religious, bureaucratic, and military systems enabled a large population to thrive and prosper in a small geographic area (Lampard, 1955). While social foundations of urbanization do not negate the importance of economic benefits and developments, those supporting this perspective do not view economic variables as the driving force of urbanization. Adams (1966), for example, suggested that the establishment of cities in Mesopotamia was primarily a social process rather than an economic one, as the new cities provided a range of institutions not previously available.

Regardless of whether social or economic factors lead to urbanization, there always appears to be a variety of consequences, both positive and negative. The benefits of living in urban centers, including greater economic opportunities, group security and defense, and numerous social institutions and systems provided through establishment of administrative authorities, help to maintain the urbanization trend. There are also the negative consequences of living in urban environments resulting from a large, sedentary population. In medieval Poland, populations living in cities likely experienced the positive and negative effects of urbanization. While they had the opportunity to succeed economically, the large, dense, sedentary population put the population at higher risk for exposure to infectious pathogens through pollution of the water supply, accumulation of garbage and waste, and poor sanitation. Before urbanization, people living in Poland did not inhabit large settlements (Gieysztor et al., 1968) and likely had less exposure to these infectious pathogens. Changes in the political and social climate, however, altered the settlement pattern for large portions of the population as the urbanization trend was firmly established.

Medieval Poland

The medieval period was a time of great change for Poland. At the beginning of the 10^{th} century, the Polanian state had yet to unite its tribal territories, some of which were under the control of the neighboring Czechs. The ruler or duke of the Polanian state, Mieszko I, sought to annex several territories, including Western Pomerania, which surrounded his well-established territory of Wielkopolska (Great Poland), Lubusz, Eastern Pomerania, and Mazovia (Manteuffel, 1982) (Figure 2.1). Western Pomerania was a strategic position to hold, as it included the area around the mouth of the Oder River on the Baltic Sea. Mieszko allied himself with Otto I, the emperor of Germany, who renounced all plans to expand into the much-desired territory. In return, Mieszko was required to pay an annual tribute to Otto for rights to this territory. Mieszko's interest in Western Pomerania was a threat to the neighboring Lutician tribes living independently between Germany and Poland. The Luticians held a strong alliance with the Czechs, whom Mieszko could ill-afford to have as a hostile neighbor. In order to avert any resulting problems, Mieszko was forced to ally himself with Boleslav I, ruler of the Czechs. The alliance was reinforced through the marriage of Mieszko and Dubrawka, Boleslav's daughter, in A.D. 965. Although Poland was not deprived of its sovereignty per se, the Polanian state was now brought into the scope of Czech politics. If Mieszko and Poland remained pagan, while Bohemia and Germany were Christian, Mieszko knew Poland's political position would deteriorate. The only logical choice for Mieszko was to be baptized Christian and to Christianize the entire country, which he did in A.D. 966. This action solidified Poland as an independent and sovereign state and strengthened the country's international position (Gieysztor et al., 1968; Davies, 1982; Manteuffel, 1982).

Figure 2.1. Regions of the Polanian state at the beginning of the 10th century.

The adoption of Christianity in Poland was generally unopposed, as missionaries from surrounding Christian countries, especially Bohemia, had already been at work in Poland. However, Christianity did, for some time, coexist with traditional pagan practices and beliefs (Kloczowski, 2000). A church administration was soon established with direct ties to the Apostolic See, although no specific church hierarchy was created (Davies, 1982; Manteuffel, 1982). For the first few years following the country's adoption of Christianity, only one apostolic bishopric, located in Poznań, was in place (Davies, 1982). Christianization served to unite the populations living in all of the Polish territories. This internal cohesion enabled Mieszko to successfully expand the borders of Poland, which eventually included the ever-important region of Western Pomerania (Gieysztor et al., 1968). The Latin character of Poland's Christianity ensured that Poland would have a strong position in Western Europe, as the majority of these countries followed the Latin form of Christendom. By the end of his life, Mieszko had united all of the major territories, including Silesia and the region of Kraków, which had formerly been under Czech control (Gieysztor et al., 1968; Manteuffel, 1982; Kloczowski, 2000). At the end of the 10^{th} century, Poland stretched from the Baltic Sea south to the Carpathian Mountains, and from the Oder River east to the Vistula River (Figure 2.2). Before his death in 992, Mieszko placed the entire country under the direct protection of the Holy See in Rome, which may have served to further strengthen Poland's position in western Christendom (Gieysztor et al., 1968; Manteuffel, 1982; Kloczowski, 2000). During the reign of Mieszko's successor and son, Bolesław Chrobry, a church hierarchy was finally created as the first archbishopric was established at Gniezno. As Poznań continued to serve as a bishopric, several other bishoprics were strategically established

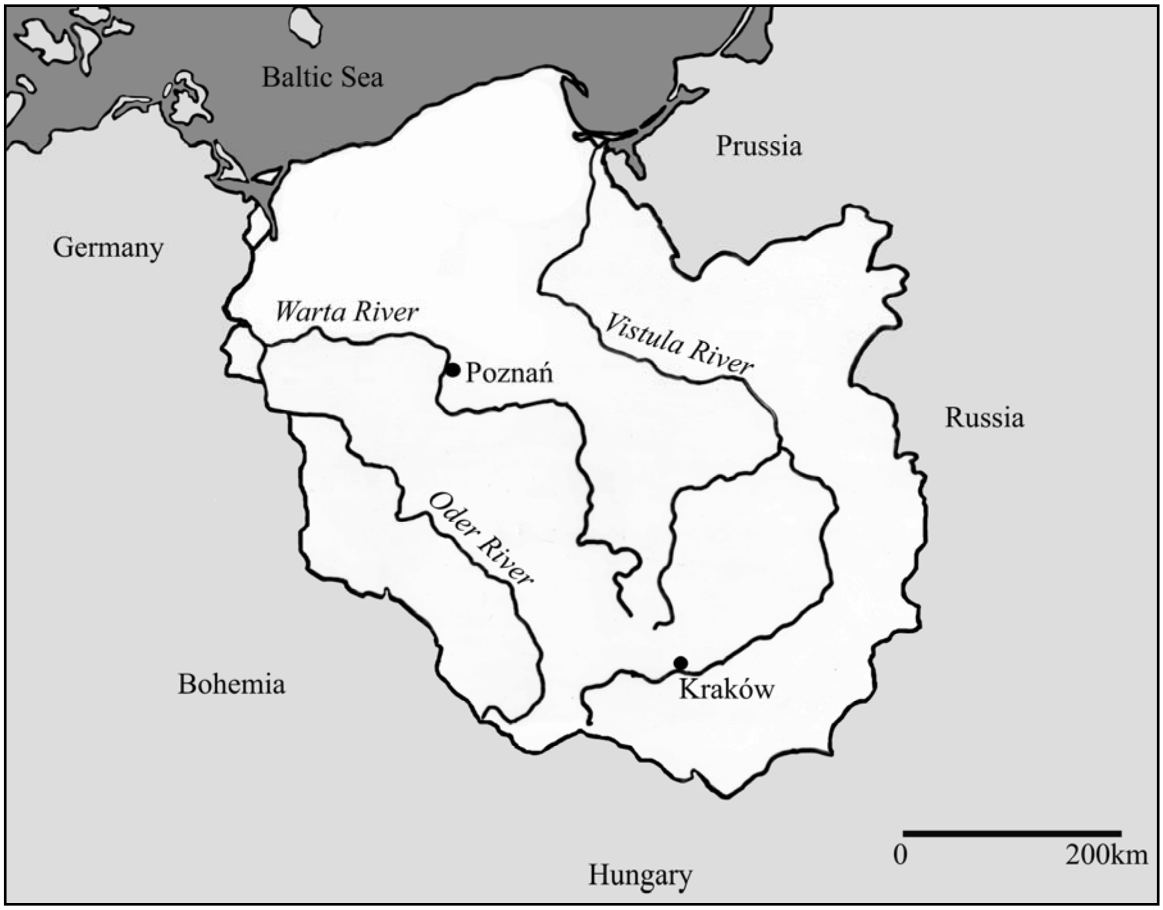

Figure 2.2. The borders of Poland in A.D. 992.

at Kraków, Wrocław, and Kołobrzeg, so the Church could serve a greater proportion of the Polish population (Davies, 1982) (Figure 2.3). The archbishop was now the religious leader of Poland with several bishops located throughout the country to carry out his orders and reinforce the rules of the Church.

Under the centralized power of ducal rule, Mieszko and his heirs introduced a new social system for the country. "Castle-towns" or *gróds* were established, where lords of the town, as representatives of the duke, resided along with their families and a military garrison (Gieysztor et al., 1968). This aggregation of people resulted in an increased demand for consumer goods, only some of which could be acquired through trade. This need for goods stimulated production in the surrounding areas, and Mieszko responded by creating a precise system of services beginning in the middle of the 10th century. This system of services, which included cobblers, bakers, cooks, and shield makers, instigated craft specialization as the production of goods and services eventually became permanent trades for artisans and servants (Gieysztor et al., 1968). Although this system did not last, craft specialization did, as rural artisans began to migrate to these urban settlements to sell their own goods and services. Based on archaeological investigations, these trades encompassed a wide range of activities, including metallurgy, pottery making, glass working, stonecutting, shoemaking, and tanning (Gieysztor et al., 1968). Fishermen and farmers were of great importance as they provided food for the inhabitants of gróds. Migration from rural settlements to gróds became increasingly popular, so much so that a few of the castle-towns grew to prominence and became known as provincial centers or *civitas*. Money, in the form of silver, was in use during the 10th and 11th centuries and could be exchanged for food, goods, and services. This

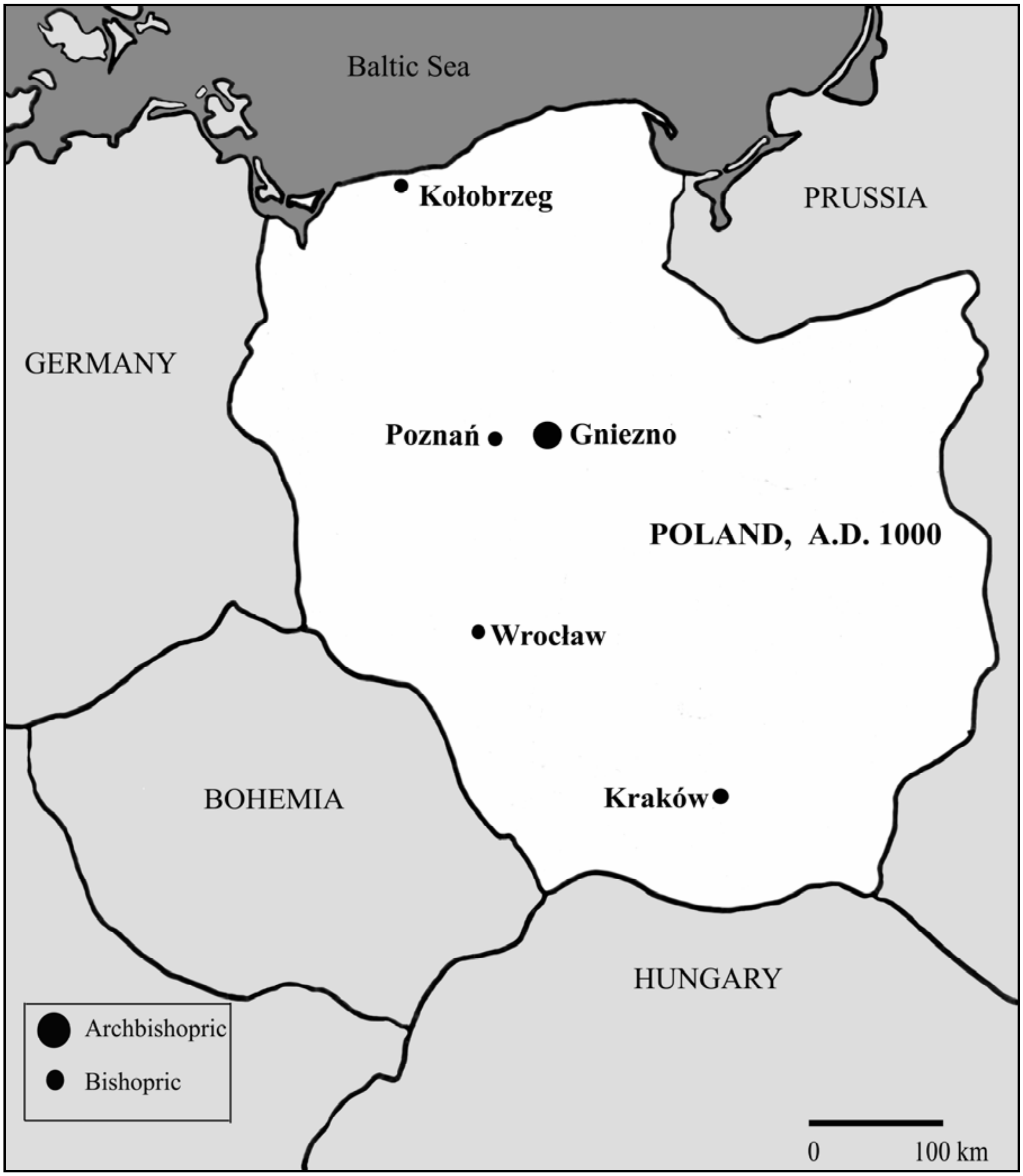

Figure 2.3. Location of Polish bishoprics in A.D. 1000. (Adapted from Kloczowski, 2000.)

burgeoning commodity-money economy of the civitas existed simultaneously with the subsistence economy of rural areas (Gieysztor et al., 1968). Those not engaged in agriculture were drawn to the large urban centers in order to make a living.

Urbanization and migration to cities was occurring in many areas throughout Europe. In medieval Russia, for example, a similar urbanization trend was taking place (Nosov, 1994). Individuals were leaving agricultural pursuits and moving to urban areas to pursue craft specialization and trade. The spread of Christianity and political changes in the country precipitated the urbanization movement, much as they appear to have done in Poland (Nosov, 1994). Urbanization also took place in Bohemia during the same period. Urban centers with craft specialization and trade drew an ever-increasing number of people from their rural roots, resulting in cities with large populations (Hensel, 1977).

In addition to establishing and intensifying craft specialization, the Polish civitas were significant for centralizing power in regions throughout Poland. Those of the highest class or nobility were appointed as local officials, known as lords or castellans and carried out a variety of military, judicial, fiscal, and administrative functions. Artisans living in urban areas were considered dependents of the duke and were required to make contributions or taxes in the form of goods or services. It is likely that the castellans were responsible for ensuring that such tributes were paid. The power of these lords extended only a short distance, likely encompassing only the inhabitants of the civitas, but few of those living in the surrounding countryside (Gieysztor et al., 1968; Davies, 1982). That is, individuals who lived in rural areas were probably outside of the scope of the castellan’s power; therefore, they were less likely to receive punishment for committing infractions. For example, rural inhabitants were also required to pay tribute to the duke by contributing a portion of their agricultural yield; however, their distance from the castellan may have enabled them to withhold more food for themselves without being discovered.

Civitas became known as administrative centers that also served as military outposts and trade centers. Additionally, many of them were the religious centers for the region as well as the homes of Catholic bishops (bishoprics). The bishop's power was comparable to that of the castellan, as the Church formed an integral part of the political structure. The rules of the Church, such as days of fast, attendance at mass, and baptism were rigorously enforced, especially within the civitas (Gieysztor et al., 1968; Kloczowski, 2000). Like secular laws, religious infractions resulted in penalties, including physical punishments. These penalties were not only condoned by the succession of Polish rulers, but in some instances, ordered by them, emphasizing the extreme influence of religion on politics in early Poland (Górecki, 1993). For example, Bolesław Chrobry supposedly ordered the teeth of individuals to be knocked out if they failed to observe a religious fast (Kloczowski, 2000). As was likely the case with taxes, rural individuals who broke fast may not have been punished, simply because they were not caught; however, residents of the civitas would have been hard-pressed to hide such an infraction.

Warfare was a common occurrence in medieval Poland, and the civitas served as points of armed resistance throughout the country (Gieysztor et al., 1968; Davies, 1982). These urban centers housed military garrisons of several thousands men, whom the castellan commanded on behalf of the duke. Many of the civitas, including Poznań, were fortified with palisades, earthen mounds, and moats. Although warfare remained almost constant throughout this period, its purpose and, therefore, its form began to change. In the early parts of the medieval period, most armed conflict was in the form of organized raiding. Beginning shortly before Poland became an independent country, wars began to be fought over control of land, as Poland attempted to annex more tribal territories and expand its boundaries (Gieysztor et al., 1968; Davies, 1982). Such organized form of conflict required large numbers of participants, and an increasing number of men were required to carry out a military duty, particularly those living in the civitas. The civitas were frequently the focus of attack from military outfits from surrounding territories and, as such, were often left to defend themselves (Gieysztor et al., 1968; Davies, 1982).

Numerous changes were occurring in medieval Poland as subsistence activities shifted, religious and governmental authorities established themselves, and warfare increased, all in conjunction with urbanization. The citizens of these urban centers most certainly were affected, especially in terms of their health and lifestyle. These effects, however, were likely a combination of positive and negative, as some areas of their lives were bolstered, such as their economic opportunities, while other areas, such as their health, were compromised. The establishment of an urbanization trend in Poland appears to have been a function of economics, as the increasing population created a greater demand for consumer goods and services. People likely were drawn to urban centers to take advantage of the better opportunities offered through craft specialization and the sale of goods and services. This economic explanation for the formation of urban centers and urbanization in Poland is not unique, as Clark (2003) has suggested that many populations experience an urbanization trend due to increased economic opportunities in cities. However, the economic benefits often occur in conjunction with detrimental health consequences in many contemporary populations (e.g., Pivovarov, 2003; Falola and Salm, 2004; Romero and Ordenes, 2004). These studies help to shed light on the complexities of urbanization and the various ways in which a population is impacted.

Contemporary Urbanization Studies

Contemporary studies of urbanization examine its impact in a variety of populations, especially those found in developing regions of the world (e.g., Pivovarov, 2003; Falola and Salm, 2004; Romero and Ordenes, 2004). These studies show that the process of urbanization can be inconsistent; it varies geographically and temporally, especially in terms of health effects and socio-economic consequences. Clark (2003) points out that today, urbanization occurs in areas with poorly developed economies, lacking the infrastructure needed to support large population growth. That is, as the population of a city increases, the support systems and economic opportunities lag behind, which results in a large group of unemployed people living in inadequate housing and being exposed to numerous pathogens and toxins due to pollution and other factors. In South Africa, urbanization has negatively impacted public health through insufficient housing and overcrowding, leading to a greater incidence of disease, especially tuberculosis (Khumalo, 2004). Studies of urbanization in Ghana reveal a similar problem (Fobil and Atuguba, 2004). The rapid influx of migrants to urban centers far exceeds the number of job openings. In addition, there is insufficient housing, leading to the development of slums and shantytowns that have poor, if any, sanitation facilities and potable water. The overcrowding from the ever-increasing population facilitates easy spread of communicable diseases and, therefore, disease rates quickly increase (Fobil and Atuguba, 2004).

Twentieth century urbanization in Russia occurred at such a rapid rate that economic opportunities could not keep pace (Pivovarov, 203). In addition, the inundation of urban centers by rural peasants could not be accommodated especially in terms of adequate housing, contributing to the recent urban crisis. By contrast, urbanization in 19th century Western Europe and America occurred in conjunction with vast economic growth; when migrants arrived in urban centers, there were often ample jobs and adequate housing available to them (Clark, 2003). This may help to explain why in some areas such as Britain, urbanization did not always lead to dramatic changes in health (Lewis, 2002).

Another major focus of research in modern studies is the consequences of urbanization. Contemporary populations, like those in the past, are affected by the problems associated with a large, sedentary population (e.g., poor sanitation, pollution of water supply). In addition, they must also contend with other health hazards, such as non-communicable diseases resulting from urban lifestyles and high rates of air, water, and soil pollution due to environmental degradation. While exposure to pollutants and the like are not restricted to urban populations, there tends to be a higher concentration in such environments (Schell, 1991). A review of studies focusing on the impact of pollution on growth concludes that many types of pollution, including air, toxic chemical, and lead, have adverse affects on pre- and post-natal growth, especially those undergoing an urban transition (Schell, 1991). A study of populations in the Southern Andes illustrates the ecological problems of urbanization, such as reduction in water infiltration and recharge and increased ground-level temperatures that replace cooler areas found in the surrounding piedmonts (Romero and Ordenes, 2004). These cooler areas serve to clean the polluted city air during the night; without them, the air pollution becomes more concentrated in urban areas. These negative environmental consequences of urbanization, in turn affect those living in urban settings as vegetation productivity and soil moisture decrease, impacting agricultural production. As the problems persist, the ability to control floods is lessened and reduced land cover increases the chances of natural hazards. In addition, air, water, and soil pollution intensifies, putting the urban population at risk for various health consequences.

Moreover, urbanization affects more than the environment; urban lifestyles in contemporary populations are characterized by a high caloric diet and reduced physical activity, which can have many varied health consequences for urban populations (Pasquet et al., 2003). In comparison to their rural counterparts, urban inhabitants eat more daily calories and use fewer calories due to a more sedentary lifestyle. This shift in lifestyle habits can lead to numerous health problems, such as obesity, heart disease, diabetes, and other obesity-related diseases (Pasquet et al., 2003). Pasquet and coworkers (2003) found an increase in obesity and chronic degenerative diseases among adults living in the capital city of Cameroon. The researchers assert these negative health effects are the direct result of an urban lifestyle that is rich in calories and low in activity. This correlation is further supported by evidence from the Pacific Islands, where chronic disease increased due to urbanization

(Pearson et al., 1993). Pearson and coworkers (1993) suggest the diseases are the outcome of high levels of stress hormones, resulting from the stressful urban lifestyle and changes in activity level, diet, and social interaction. A comparative study of urban and rural residents of Greece demonstrated a higher risk for type II diabetes in urban males than rural males (Matalas et al., 1999). This increased risk was proposed to be the result of dietary differences between the two settings. Urban lifestyle included a change in diet to one richer in animal protein and poorer in complex carbohydrates, putting those who consume such a diet at higher risk for diabetes and cardiovascular disease.

Why, then, does urbanization continue in the face of such negative health consequences? This question is yet another important focus of modern urbanization studies. The reasons for its persistence vastly differ, depending on geographical and temporal factors. For example, Khumalo (2004) suggests that in South Africa, urbanization continues because urban environments are similar to rural environments in terms of living conditions, resulting in no distinct advantage to living in rural settings. In this case, urbanization persists because it is not better or worse than the alternative of living in non-urban areas. In other cases, urbanization may persist because any resulting decline in health is not sufficiently severe or rapid for the population to take notice. In other words, the urban inhabitants simply do not recognize that there is a decline in community health; health, therefore, is not a determining factor for migrants' decision to remain in an urban center. Additionally, migrants to cities may not find the economic opportunities they had hoped for, but the alternative is no better; they may choose to stay, because at least there is the hope of more job availability and thus, improved economic conditions. Lastly, even if urban migrants recognize that their health has been negatively affected, it may be viewed as a necessary cost for the economic advantages and opportunities the city provides, which enables them to assist their families residing in urban and rural environments.

Statement of Hypotheses

The persistence of urbanization in historical populations, including medieval Poland may also be understood through similar explanations, in particular, the lack of recognition by the population that the overall community health is being affected. While contemporary studies have routinely demonstrated the impact of urbanization on the health of populations, they do not, however, address the severity and rate with which these health consequences occur. By understanding the nature of a change in health status in terms of its severity and rate, insight can be gained into the perceptibility of these detrimental effects. In other words, if a change in health was not severe and it occurred at a gradual pace, then the reason why urbanization persists despite negative health effects becomes less ambiguous. The population may simply not perceive their changing health status because it occurred slowly over many years and its affects were mild. Alternatively, the population may have adjusted the circumstances at hand; in effect, it adapted to an environment characterized by greater health risks (Goodman et al., 1988). Poorer health may have been considered a compromise for greater economic opportunities presented by the urban center.

While the health consequences of urbanization remains a topic of much anthropological inquiry, the impact of urbanization on other aspects of life are infrequently addressed. The numerous changes occurring in medieval Poland, such as the shift in subsistence activities, the establishment of religious and secular authorities, and the increase in organized warfare most certainly affected its citizens. While these changes may have most acutely affected the health of the population, activity patterns, interpersonal violence, and diet may have also been impacted. Three skeletal collections from the medieval city of Poznań, Poland, will be used to assess the impact of urbanization on health and lifestyle of the population. The three collections, Śródka, Garbary, and Wodna, date to A.D. 950 – 1250, the period during which Poland experienced an urbanization trend in response to the social and political changes of the time. These collections will comprise three temporal samples: pre-urbanization (A.D. 950-1025), early urbanization (A.D. 1025-1100), and late urbanization (A.D.1100-1250). The existence of these skeletal collections from this important period of change in Poland's history enables the following questions to be addressed: What do the patterns of health, diet, violence, and subsistence activities indicate about the effects of urbanization? What is the nature of these effects (i.e., gradual vs. rapid, severe vs. moderate)? In this dissertation a rapid health decline would be one in which there is substantial change in health between the pre-urbanization sample and the early urbanization sample. A gradual decline in health, on the other hand, would be reflected in significant health differences between the pre-urbanization and the late urbanization, but not between the pre-urbanization and the early urbanization samples. To address these questions, the following hypotheses will be tested.

Hypothesis 1: Health status changed gradually as urbanization intensified, demonstrated through a greater prevalence of stress indicators and specific

infectious diseases as well as the reduction of adult stature in the later, more urbanized population.

The features of urbanization, such as increased population density and sedentism (McGrath, 1992; Storey, 1992), are associated with greater exposure to pathogens through poor sanitation, increased accumulation of garbage and waste, and pollution of the water supply. Additionally, the close living conditions of an urban environment facilitate the transmission of contagious "crowd" diseases (Cohen, 1989; McGrath, 1992; Storey, 1992; Larsen, 1997). This hypothesis suggests that the increased exposure to infectious pathogens resulting from conditions associated with urbanization will contribute to a higher rate of specific infectious diseases (leprosy, treponematosis, tuberculosis) and nonspecific infection (periostitis) in the later samples. Stress indicators (enamel hypoplasia, porotic hyperostosis, cribra orbitalia) are also expected to increase temporally, as the amount of physiological stress intensifies due to a greater pathogen load in the population. This hypothesis further suggests that reduced adult stature in the later samples will be the result of an overall decline in health; however, this health decline is expected to be gradual and more discernable when comparing the earliest and latest samples.

Hypothesis 2: Diet did not change substantially with urbanization, demonstrated in a temporally consistent level of oral health and similar patterns of tooth wear.

Dental pathological conditions, such as dental caries, periapical lesions, and antemortem tooth loss are sensitive indicators of dietary change. This hypothesis suggests that although other aspects of health and lifestyle changed due to urbanization, diet remained constant. Polish rulers required that farmers and fishermen supply the urban centers with foods (Gieysztor et al., 1968), which would have resulted in a similar diet over time. While days of abstinence from meat were enforced following the adoption of Christianity, fish was an adequate alternative, with similar nutritional quality (Dembińska, 1999).

Hypothesis 3: Subsistence activities significantly changed with increased urbanization, reflected in changes in the pattern, prevalence, and/or severity of degenerative joint disease (DJD). Furthermore, the amount of variation in the pattern, prevalence, and severity of DJD will increase temporally.

As activity patterns have been implicated in the development of DJD (Bridges, 1991a, 1991b, 1992; Hough, 2001), this hypothesis suggests the shift from agriculture to craft specialization will be correlated with changes in the pattern, prevalence, and/or severity of joint involvement in DJD. In craft specialization, the population as a whole is engaged in a greater variety of activities than in agriculture. Consequently, while agriculture may produce a distinct pattern of DJD, it is anticipated that under craft specialization there will not be one unique pattern. Instead, this hypothesis suggests that the later samples will have a greater variety of DJD patterns.

Hypothesis 4: The occurrence of interpersonal violence (i.e., warfare) was greater in the later, more urbanized population, reflected in a higher prevalence of trauma over time.

This hypothesis suggests that males living in the later, more urbanized setting were likely to be involved in interpersonal conflict, especially organized warfare (Gieysztor et al., 1968; Davies, 1982). Additionally, individuals from the later, urban samples were subject to a greater number of civil and religious laws, which were often enforced through physical punishments. Although females may show signs of trauma, it is expected that males will show a greater prevalence of traumatic injuries resulting from interpersonal violence.

Summary

The breadth of research on the consequences of urbanization reveals a general trend: urbanization tends to cause a change in health status, although there is substantial variation in the severity of the change and the aspects of health that are affected. Although there is considerable variation in the degree to which health, activity patterns, diet, and interpersonal violence are affected, in most studies the conclusion is that these aspects of health have been affected by urbanization. Factors such as time period, geographic location, and cultural practices may affect the ways in which a population is impacted by urbanization.

Urbanization is a complex process, and in medieval Poland, a number of events occurred that initiated the urbanization trend and a variety of effects were produced. The establishment of Poland as an independent country and the adoption of Christianity led to the urbanization trend that focused on several villages in Poland, including Poznań. Initially, urbanization occurred in response to the establishment of military garrisons and bishoprics at these villages. The inhabitants needed consumer goods and services, which drew people from the surrounding countryside to fulfill these needs. As more people moved to the city, the demand for these goods and services also increased, eventually turning the village into a substantial city. Activity patterns changed as people shifted from agriculture to craft specialization. Sanitary conditions declined as the increase in population size led to accumulation of garbage and waste and pollution of the water supply. These effects likely impacted the population as a whole.

Based on this contextual information, four main hypotheses were tested by this study. First, health was expected to change, reflected in a temporally greater prevalence of stress indicators and infectious diseases. Secondly, activity patterns changed, as the pattern, prevalence, and severity of DJD changes. Thirdly, diet did not change, reflected in a temporally consistent level of oral health. Lastly, interpersonal violence increased, as evidenced by a temporally greater prevalence of traumatic injuries.

CHAPTER 3

MATERIALS AND METHODS

Before the hypotheses of this dissertation can be tested, it is important to understand the origins of the skeletal materials analyzed as well as the parameters for data collection and the methods of statistical analysis. This chapter will describe the three medieval Polish skeletal collections included in this study. In addition, the methods for sex determination, age estimation, and assessment of all skeletal indicators of health and lifestyle will be examined. For each skeletal indicator, I discuss its etiology, skeletal expression, and significance for health and/or lifestyle. In addition to describing each skeletal marker, the scoring system used for recording each condition is presented. Lastly, I describe the statistical methods that were employed to determine whether the hypotheses should be accepted or rejected.

Materials

In order to test the hypothesis that urbanization impacts the health and lifestyle of a medieval Polish population, osteological data were collected from three medieval skeletal collections: Śródka cemetery (A.D. 950 – 1150), Wodna cemetery (A.D. 950 – 1150), and Garbary cemetery (A.D. 1150 – 1250). These cemeteries were originally located in the city of Poznań, situated in the west-central area of Poland (Figure 3.1). The

Figure 3.1. Location of Poznań in modern-day Poland (adapted from the Regional Environmental Center for Central and Eastern Europe – http://www.rec.org/REC/Maps/pol_map.html)

Śródka cemetery was located in the center of the city, along the Cybina River, a tributary of the Warta River, and the Wodna and Garbary cemeteries were located in the more western part of the city center (Pawłak, 1998, 2005a, 2005b; Figure 3.2).

The Śródka cemetery was discovered in 1994 by archaeologists conducting a survey on behalf of the Archaeological Conservatory Studio of Poznań before new water pipes were installed by the city (Pawłak, 1998, 2005a; Figure 3.3). The cemetery was later excavated between 1996 and 2001, exposing 271 burials. Radiocarbon dating and cultural associations were used to date five burial levels within the cemetery: level I: A.D. 950-1025, Level II: A.D. 1025-1075, Level III: A.D. 1050-1100, Level IV: A.D. 1100, Level V: A.D. 1100-1250 (Pawłak, 2005a). This cemetery was likely established in conjunction with the beginnings of Christianization of medieval Poland following the baptism of Mieszko I (Pawłak, 2005a). The creation of a church cemetery would have helped to propagate the new faith in the city of Poznań.

The burials contained individuals of both sexes and a range of ages. The graves were oriented in a variety of directions, the majority of which were oriented with their heads toward the east or the west, while a few had their heads toward the north, the northwest, the southeast, or the northeast (Pawłak, 2005a). More than half of the graves had wooden constructions, which has been suggested to represent burial near a church (Pawłak, 2005a). Stone constructions, typically associated with pre-Christian burial, were also found in some of the graves. Within the graves, a variety of burial accompaniments were recovered, including jewelry (e.g., rings, pendants), tools (e.g., knives, whetstones), household goods (e.g., dishes, buckets, needles), and other goods (e.g., coins, nails). Additionally, animal remains, eggshells, grain seeds, and other materials were often

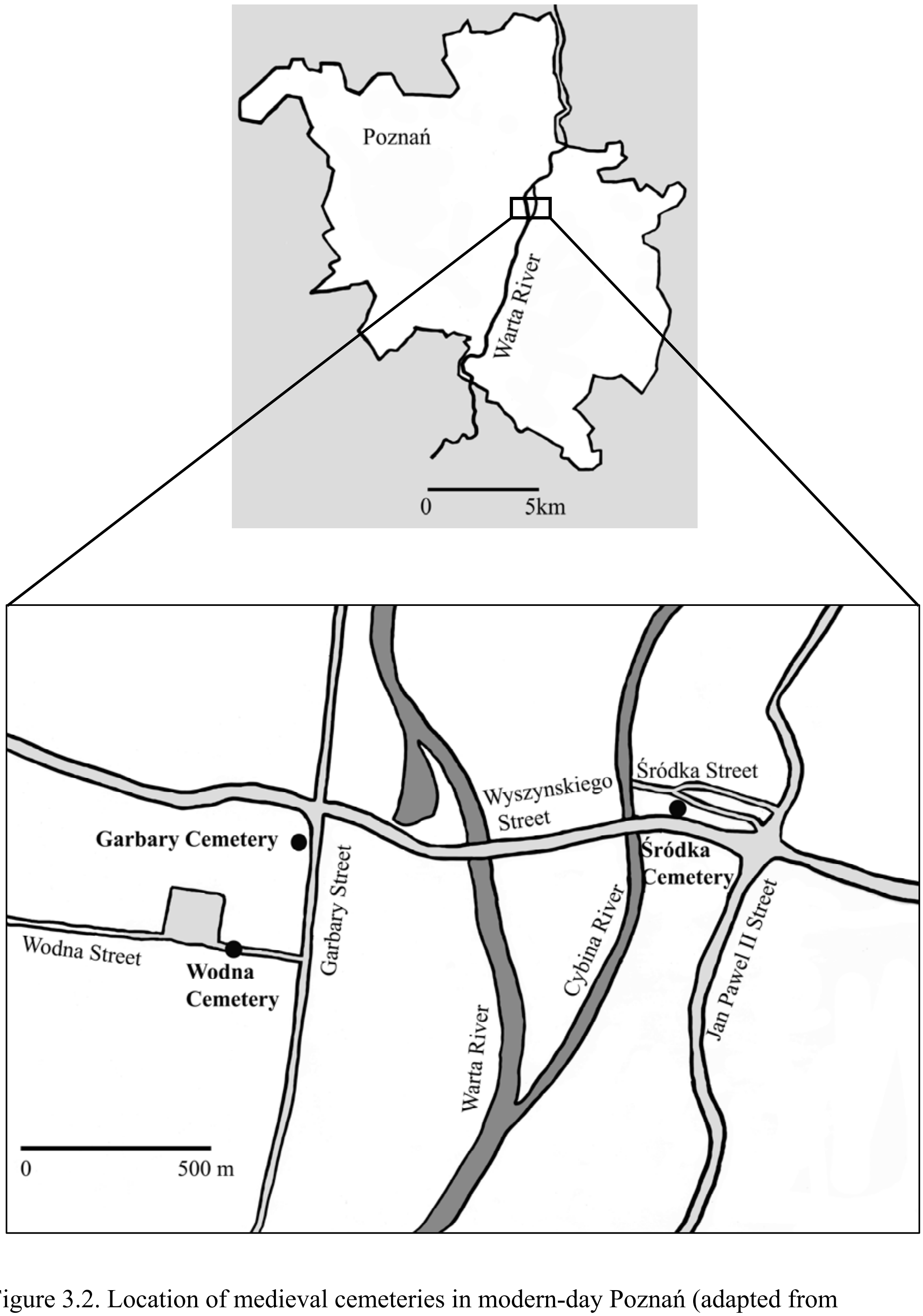

Figure 3.2. Location of medieval cemeteries in modern-day Poznań (adapted from http://www.cs.put.poznan.map/mapa.gif)

Figure 3.3. Site map for Śródka cemetery (adapted from Pawłak, 2005a)

found in association with the burials (Pawłak, 2005a). The presence of several hearths near the graves possibly reflects the burial ceremony. Archaeologists suggest that fires were burned before and after burial and that embers were placed in the grave, on top of the coffins (Pawłak, 2005a). Charcoal was found with many of the burials, which provides evidence of this custom. This burial practice was common in the medieval period, particularly at the end of the 10^{th} century through the first half of the 12^{th} century (Pawłak, 2005a), falling within the range of dates for this cemetery.

The Wodna cemetery was discovered in 1993, through a survey carried out by the Archaeological Conservatory Studio of Poznań prior to installation of new water pipes by the city (Pawłak, 2005a; Figure 3.4). Ten burials, containing eleven individuals, were recovered and dated through cultural associations to A.D. 950-1150. The individuals are of both sexes and adults and subadults are represented. Like the Śródka cemetery, individuals were oriented in a variety of directions, including towards the southwest, the northeast, the west, and the north (Pawłak, 2005a). Two of the graves had remnants of wooden constructions, or coffins. Grave goods consisted of knives, projectile points, glass beads, and various other materials. Remains of burned material were also found in many of the burials, suggesting a similar burial practice to that of Śródka (Pawłak, 2005a).

The Garbary cemetery was excavated in 1970-1971 by the Poznań Archaeological Museum and in 1994 by the Archaeological Conservatory Studio of Poznań as part of an archaeological survey being conducted in conjunction with the installation of new water pipes by the city (Pawłak, 2005a; Figure 3.5). Two cemeteries were located during the excavations: a medieval cemetery (A.D. 1150 – 1250) and a late medieval/post-medieval

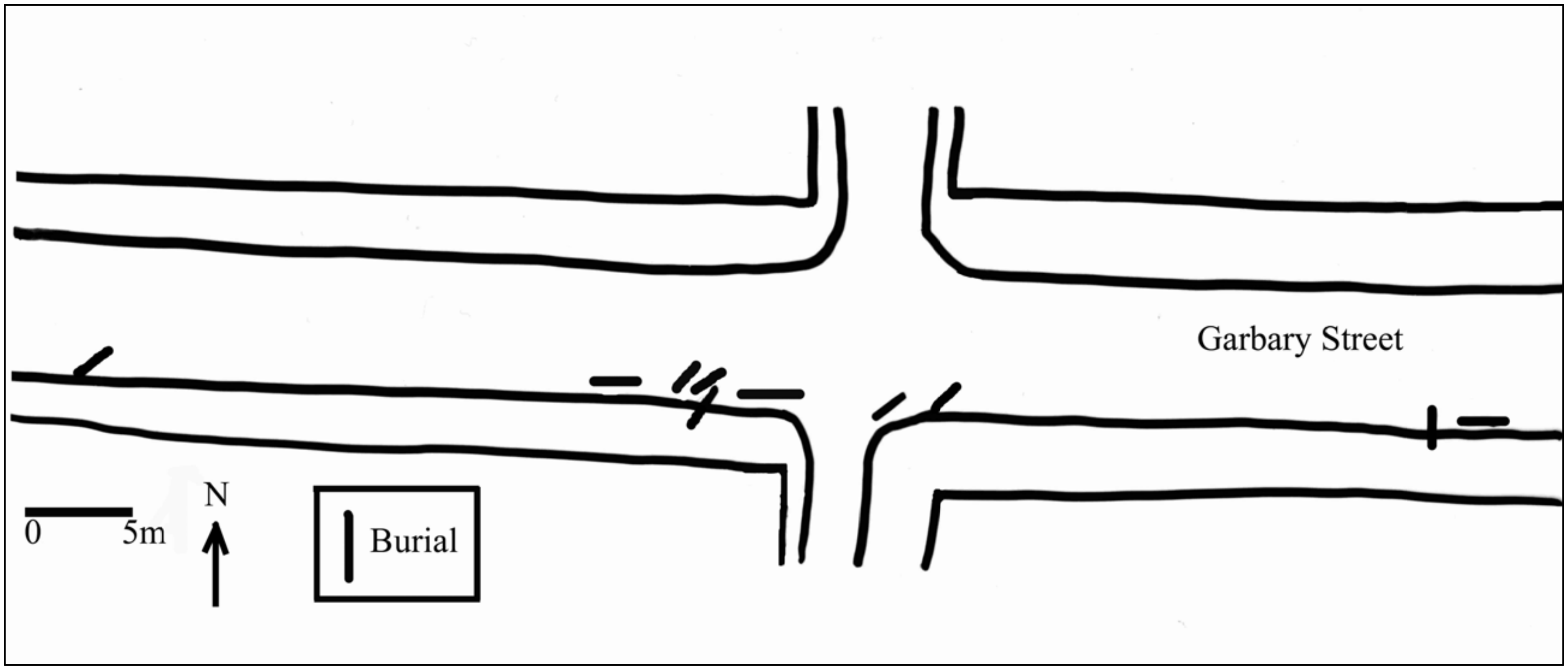

Figure 3.4. Site map for Wodna cemetery (adapted from Pawłak, 2005a)

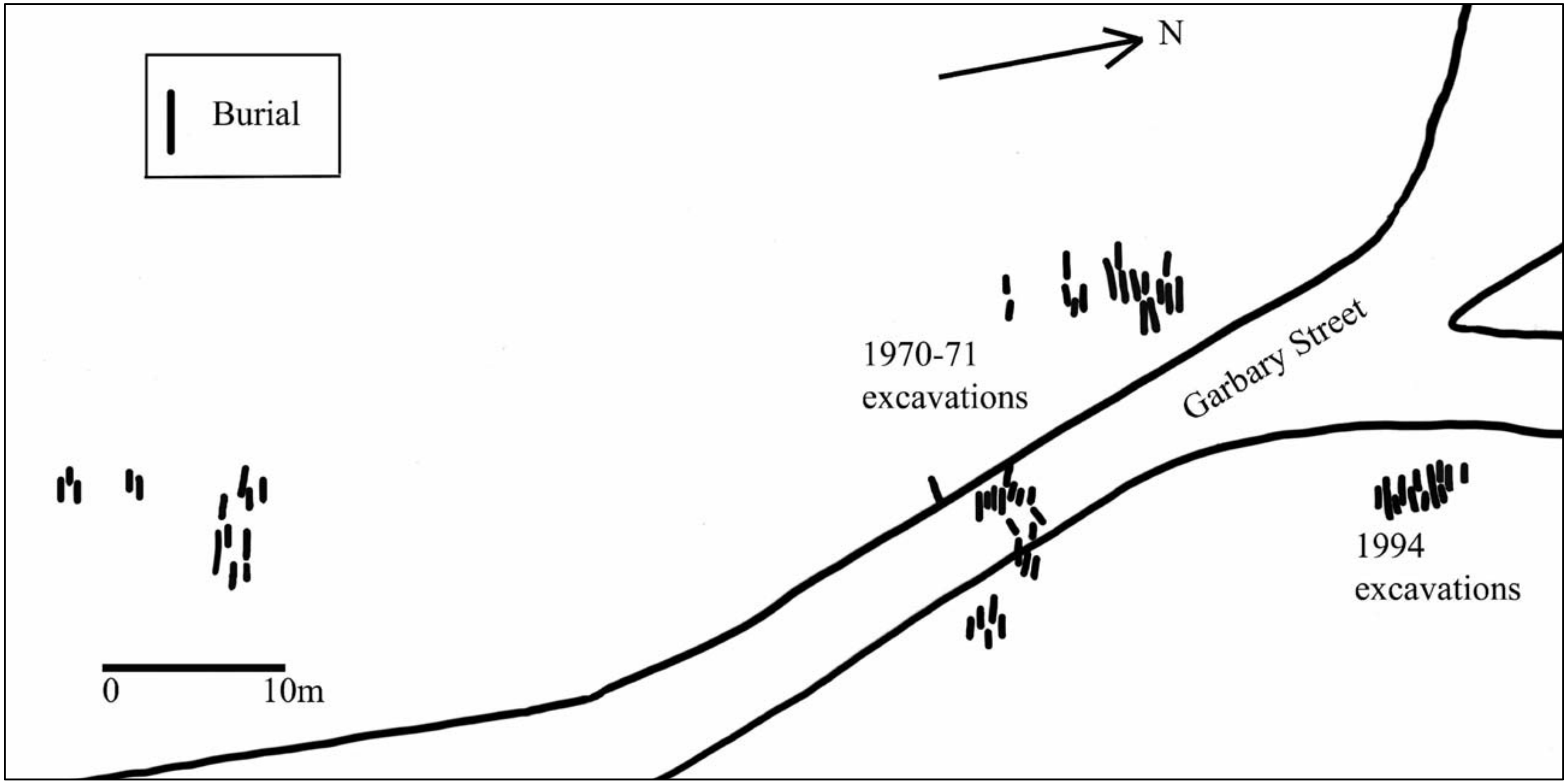

Figure 3.5. Site map for Garbary Street (adapted from Pawłak, 2005a)

cemetery (A.D. 1300 – 1700) (Borysewicz-Lewicka and Otocki, 1997; Pawłak, 2005a). Only the medieval cemetery is considered here. During the earlier excavation, two groups of graves from the medieval cemetery were recovered. In the southern cluster, approximately 17 individuals were found, and in the northern cluster, 38 individuals were recovered. During the 1994 excavation, an additional 28 individuals in 14 graves were found (Pawłak, 2005a). It has been suggested that the two clusters of graves represent two separate cemeteries, as the northern group is somewhat older than the southern group (Pawłak, 2005a). In addition, the two cemeteries appear to have been a feature of a church that was located on Garbary Street during the period to which these graves are dated. This church was in use only to approximately A.D. 1244, which coincides with the terminal date of the cemeteries (Pawłak, 2005a). The individuals recovered from Garbary represent both sexes and a range of ages. All individuals, except two, were oriented with their heads toward the west, and only a few burials included grave goods, such as a comb, a buckle, an awl, and knives (Pawłak, 2005a). The majority of the burials had the remnants of wooden constructions or coffins, which again may indicate its relationship to a church (Pawłak, 2005a).

The more limited number of grave goods and the almost complete adherence to a west orientation of the graves may reflect the younger age of the Garbary cemetery than either Wodna or Śródka and, thus, a better established form of Christianity. The older cemeteries may indicate an intermediate form of faith that was in use when Christianity was first adopted (Pawłak, 1998). This intermediate form, known as dual faith, would have included elements of both the original, pagan religion and the newly adopted Christianity (Pawłak, 1998). As a result, the older burials at Śródka and Wodna during early Christianity would have had elements of both, hence, the variation in grave orientation, the inclusion of a variety of burial accompaniments, and the use of wooden constructions or coffins. The succession of rulers in Poland sought to eliminate pagan traditions, eventually creating a more fully Christian religion (Pawłak, 1998). This removal of pagan elements and the acceptance of pure Christianity over dual faith would likely have been reflected in burial practices, such as that seen at Garbary.

Śródka, Wodna, and Garbary were chosen for this study, because they represent the three time periods of interest: pre-urbanization, early urbanization, and well-established urbanization, which here will be called late urbanization. The three cemeteries contain individuals of both sexes and a range of ages (Pawłak, 2005a, 2005b), and the cemetery locations indicate they include citizens of non-elite status who would have likely been engaged in various crafts and trades (Pawłak, 2005b). Therefore, these samples are representative of the majority of the Polish population during the Medieval Period. Due to spatial and temporal comparability, the three cemetery samples were collapsed into a single sample, which was then divided according to time period: (1) pre-urbanization (A.D. 950 – 1025), including individuals from Level I at Śródka and from Wodna, (2) early urbanization (A.D. 1025 – 1100), including Levels II and III from Śródka, and (3) well-established, or late urbanization (A.D. 1100 – 1250), including individuals from Garbary and from Levels IV and V of Śródka. Wodna was placed in the earliest category based on the assertion that the ten burials likely represent the oldest part of its age range (Pawłak, 2005b). Together, these samples provided a total of 164 skeletons (Table 3.1, Figure 3.6). Skeletal remains from Śródka that were disturbed prior to excavation could not be properly associated with a particular burial level; therefore,

Skeletal Sample	Total Number of Skeletons	Pre-Urbanization Skeletons A.D. 950-1025	Early Urbanization Skeletons A.D. 1025-1100	Late Urbanization Skeletons A.D. 1100-1250
Poznań-Śródka	140	37	67	36
Wodna	10	10	0	0
Garbary	14	0	0	14
Total	164	47	67	50

Table 3.1: Medieval Polish skeletal samples

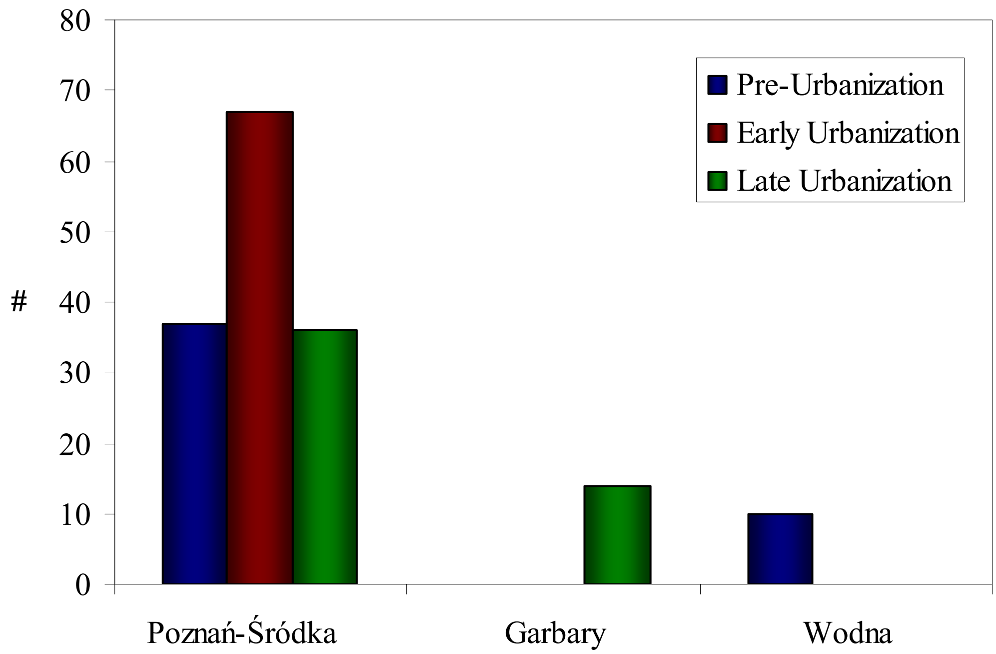

Figure 3.6: Medieval Polish skeletal samples

these remains were excluded from this study. Of the 83 skeletons excavated at Garbary, only 14 sets of remains could be located for inclusion in this study. The three collections are curated by the Poznań Archaeological Museum and are currently housed at the First Piasts Museum in Dziekanowice, Poland.

Methods

Data Collection

Skeletal data were collected in Dziekanowice, Poland, during the summers of 2004-2006. Data collection was aided by the use of software and a codebook designed for the Global History of Health (GHH) project[1]. The main goal of this project is to assess the history of health on a worldwide scale, beginning in the late Paleolithic through the twentieth century. By comparing the results of analyses of skeletal samples from all regions and periods, the GHH project aims to identify specific trends that have occured in terms of health and lifestyle. Through the development and use of a single system of coding skeletal markers of health and lifestyle, this project is able to conduct large-scale comparisons in time and space. Researchers from all over the world collaborate on this project to ensure global representation of populations living throughout the past several millennia. The software developed by the GHH project requires the user to code each skeleton in a collection for a large number of variables pertaining to health and lifestyle.

[1] The GHH project involves bioarchaeological researchers from around the world. These researchers collect data from skeletal collections representing a range of geographical and temporal settings. These data are then combined with historical, archaeological, and climatological data in order to gain a more holistic perspective on health in human history. The principal investigators of this multi-disciplinary project are Richard H. Steckel (Department of Economics, Ohio State University), Clark Spencer Larsen (Department of Anthropology, Ohio State University), Paul W. Sciulli (Department of Anthropology, Ohio State University), and Phillip L. Walker (Department of Anthropology, University of California-Santa Barbara).

All skeletal variables of interest utilized in this study are included in the GHH software. All scoring systems used in this study adhere to the protocols of the GHH project (Appendix A).

Age and Sex Estimation

Adult age estimations were conducted using standard anthropological protocols, including pubic symphyseal changes and auricular surface changes (Lovejoy et al., 1985; Brooks and Suchey, 1990; Buikstra and Ubelaker, 1994). Whenever possible, both age estimation methods were used in order to provide a better assessment of age. When both the left and right elements were present for either method, the left was used for scoring.

The Suchey-Brooks method for age estimation from the pubic symphysis involves assessing age-related morphological changes of this joint surface. The pubic symphysis, where the two pubic bones meet anteriorly, undergoes a number of changes with age, including rim development and erosion along the margins of the symphyseal face, loss of its billowing surface, and increase in porosity (Brooks and Suchey, 1990). The Suchey-Brooks method divides these changes into six categories or phases, each of which is associated with a mean and range of ages. This method assesses ages for males and females separately. Illustrations of each phase, depicting minimum and maximum changes, supplement the descriptions (Brooks and Suchey, 1990). One of the main drawbacks of the Suchey-Brooks method is that most of the categories have large age ranges around the mean. For example, phase 5 for females has a mean of approximately 49 years of age, but a range of 25 – 60+ years (Brooks and Suchey, 1990).

Age-related auricular surface changes were also used to make age estimations for adults. The auricular surface is the region of the pelvis that creates a joint with the sacrum. Like the pubic symphysis, the auricular surface undergoes a number of morphological changes as an individual ages (Buikstra and Ubelaker, 1994), including loss of billowing of the surface, increase in porosity, and increase in marginal lipping and surface irregularity (Lovejoy et al., 1985). Photographs of examples of each phase accompany the descriptions to aid in phase assessment (Buikstra and Ubelaker, 1994). These changes are categorized in 8 phases, each of which is associated with a range of ages (Lovejoy et al., 1985). While the age ranges are considerably smaller than those of Suchey-Brooks pubic symphysis method, (e.g., phase 2: age 25-29 years), many of the characteristics and changes associated with each level can be difficult to discern on the auricular surface in question, as many of these changes are a matter of degree.

Subadult age estimations were carried out using stages of tooth formation and eruption and tooth seriation (Smith, 1991; Hillson, 1992), as well as epiphyseal closure (Buikstra and Ubelaker, 1994). For the epiphyseal closure method, all skeletal elements were used in the estimation, and when both right and left elements were present, the left was used for scoring. All available and accessible teeth were used in the dental methods of age estimation.

To estimate subadult age from tooth formation and eruption, the stage of enamel or root formation was compared to diagrams showing the sequence of formation and eruption (Hillson, 1992). For each stage, an age estimate and range is provided. For example, the sixth stage in the sequence gives and age of 1 year, with a range of +/- 4 months (Hillson, 1992). Tooth seriation was also conducted, which involves an initial determination of enamel and/or root formation followed by a sequencing of all subadult individuals in the sample from least developed to most developed (Smith, 1991; Hillson, 1992). Individuals were then grouped according to stage of tooth development, providing a continuum from youngest to oldest in the sample.

In conjunction with the dental methods of age estimation in subadults, epiphyseal closure was used. Assessments of the proximal and distal epiphyses of all long bones (i.e., humerus, ulna, radius, femur, tibia, and fibula) and other elements (e.g., clavicle, vertebra) were made to determine whether the epiphysis had attached to the diaphysis and whether that fusion was complete (Scheuer and Black, 2000). Based on a chart of union and fusion of the epiphysis and diaphysis, and age estimation was made. The chart provides a bar, the left end of which indicates the age at initial union and the right end, which indicates the age of complete fusion (Scheuer and Black, 2000). When multiple elements are available, the age of the individual is narrowed accordingly. For example, if the distal epiphysis of the humerus is completely fused (age 15 years) and the medial epicondyle of the humerus is in the process of fusing (age 11-19 years), the resulting age can be narrowed to age 15-19 years.

While subadult aging methods are generally more precise than adult aging methods, the most significant drawback of subadult methods is that the skeletal and dental ages may not coincide, particularly in a population that is under stress. Although dental formation is generally not affected by environmental stressors (Smith, 1991), skeletal growth and development is highly sensitive (Goodman et al., 1988; Steckel, 1995). Therefore, in this study, when dental and skeletal age did not coincide, dental age was used.

After all age estimation methods were taken into consideration, an overall minimum age and maximum age were assigned. Based on these age ranges, each individual was assigned to a general category. Subadults were assembled into 5-year age groups: C1 (birth-4 years), C2 (5-9 years), C3 (10-14 years), and C4 (15-19 years). Fetal remains were put into a separate category (F). Adults were assembled into large age groups: YA: Young Adult (20-35 years), MA: Middle Adult (35-50 years), and OA: Old Adult (50+ years). Individuals were assigned to an age group based on the best fit of their estimated age ranges. Subadults and adults who were not able to have their age estimated were placed in nonspecific subadult (C) and adult (A) categories, respectively. Those individuals who could not have any age estimation performed and could not be placed in the general subadult and adult categories were placed in an undetermined age group (U).

Sex estimations of adults were carried out based on pelvic and cranial morphology (Buikstra and Ubelaker, 1994; Steckel et al., 2006). All features present were used to provide the most accurate determination of sex. When both the right and left elements were present for a feature, the left was used for scoring.

A number of features on the pelvis were used in sex determination, as the pelvis is considered the best indicator of sex (Buikstra and Ubelaker, 1994). Each feature was scored on a scale of 1 – 9, with the exception of the greater sciatic notch and the preauricular sulcus (Steckel et al., 2006). A score of 1 indicates a definite male trait, while a score of 9 represents a definite female trait. The features of the pelvis assessed for sex were the ventral arc, the subpubic concavity, the subpubic angle, the ischiopubic ramus ridge, the arc composé, the greater sciatic notch, and the preauricular sulcus. The ventral arc is an area of bone on the ventral surface of the pubis, near the pubic symphysis. Females have a highly developed ridge of bone, while males have a flat to slight ridge (Buikstra and Ubelaker, 1994; Steckel et al., 2006). The subpubic concavity is scored according to the degree of concavity of the inferior border of the ischiopubic ramus, near the pubic symphysis. Females have a highly concave ischiopubic ramus, and males have a convex ramus (Buikstra and Ubelaker, 1994; Steckel et al., 2006). The subpubic angle is created by the inferior margins of both ischiopubic rami; females have a wide angle and males have a narrow angel (Steckel et al., 2006). The ischiopubic ramus is also assessed for the degree of development of a ridge just inferior to the pubic symphysis. Females have a narrower and more highly developed the ridge than males, who tend to have a wide, flat surface (Buikstra and Ubelaker, 1994; Steckel et al., 2006). The arc composé is created by the most anterior margin of the auricular surface and the inferior margin of the greater sciatic notch. If the two margins form one continuous curve, then the trait is more female; if the margins form two separate curves, then the trait is more male (Steckel et al., 2006). The greater sciatic notch varies is located just inferiorly to the auricular surface on the posterior border of the pelvis. The notch varies in its width according to sex, although it is not always the most reliable indicator, as other factors may cause the greater sciatic notch to be wider or narrower than expected. The greater sciatic notch is scored on a scale of 1 to 5, with 1 indicating a very wide notch and 5 indicating a very narrow notch (Buikstra and Ubelaker, 1994; Steckel et al., 2006). Finally, the preauricular sulcus is assessed to determine sex. The preauricular sulcus is located on the inferior margin of the auricular surface on the posterior aspect of the ilium. In its most highly developed form, the sulcus is wide, deep, and usually runs the entire length of the auricular surface (Buikstra and Ubelaker, 1994). The preauricular sulcus is scored on a scale of 1 to 4, with 1 indicating a smooth surface with no sulcus and 4 indicating a large, well-developed sulcus (Steckel et al., 2006).

Various features of the cranium were also used to determine sex. Although less reliable than the pelvis, these features reflect sex, because males tend to be larger and more robust than females (Buikstra and Ubelaker, 1994). However, there is a great amount of variation depending on the population in question. Each feature is scored on a scale of 1 - 5, with 1 representing a highly gracile feature and 5 representing a very robust feature (Steckel et al., 2006). The features assessed were the nuchal crest, the mastoid process, the supraorbital margin, the supraorbital ridge/glabella, and the mental eminence. The nuchal crest is an area of muscle attachment on the posterior aspect of the cranium. In order to score this feature, the skull is viewed from either lateral side to assess the degree of prominence and rugosity (Buikstra and Ubelaker, 1994). The mastoid process is a projection of bone just posterior to the external auditory meatus. This feature is scored according to its overall size, not just its length; however, the degree of projection below the level of the external auditory meatus is taken into consideration (Buikstra and Ubelaker, 1994). The supraorbital margin, or the upper margin of the eye orbit, is assessed for its thickness by "pinching" this margin. The thicker the margin, the more robust it is scored (Buikstra and Ubelaker, 1994). The supraorbital ridge or glabella is the area just superior to and in the middle of the eye orbits. Like the nuchal crest, the cranium must be viewed from either side in order to assess the degree of prominence of this feature (Buikstra and Ubelaker, 1994). Lastly, the mental eminence on the middle anterior aspect of the mandible is assessed for its projection and rugosity (Buikstra and Ubelaker, 1994).

Together, these features of the pelvis and cranium were used to assign a sex score for the individual. In this study, all scores fell along a continuum of 1 - 9, with 9 representing a definite female and 1 indicating a definite male. Those with a score of 5 were assigned to an undetermined sex category. Individuals with scores ranging from 6 to 9 were grouped in the female category, and those with scores ranging from 1 to 4 were grouped in the male category. Only adults were scored for sex; no sex was determined for subadults.

Skeletal Markers and Pathological Conditions

In order to assess changes in health and lifestyle in the medieval Polish population, the skeletal remains from Śródka, Wodna, and Garbary were examined for the presence of a variety of skeletal markers and pathological conditions. The overall health of a population involves a number of contributing factors, such as systemic stress, infection, and diet (Larsen, 1997). For each of these factors, there are specific skeletal indicators that reflect particular aspects of community health. An additional variable of health I chose to include in this study is stature, which is affected by the combination of systemic stress, infection, and diet (Goodman et al., 1988; Steckel, 1995). Systemic stress can be assessed through two main skeletal markers: porotic hyperostosis/cribra orbitalia and enamel hypoplasias. These indicators were chosen for this study because they represent different types of systemic stress that may affect a population, as the former reflects anemia and the latter represents growth disruption (Lallo et al., 1977; Goodman et al., 1980).

Infection is assessed in terms of specific infectious diseases as well as nonspecific infection. In this study, I examined the remains for the presence of periostitis, an inflammatory condition resulting from bacterial infection or traumatic injury, as well as three specific infectious diseases: leprosy, treponematosis, and tuberculosis. These three specific infectious diseases were selected, because they all can manifest on the skeleton during the course of the infection (Roberts and Manchester, 2005). Other diseases, such as small pox or influenza are of short duration, often killing the individual before the skeleton becomes affected. In addition, leprosy and tuberculosis were considerable health problems in Europe during the Medieval Period (Roberts and Manchester, 2005). The presence of treponematosis, or treponemal disease, in pre-Columbian Europe is less certain, although isolated cases have suggested its presence before contact with the New World (Roberts and Manchester, 2005). Since there has been no definitive claim as to the timing of the origins of treponemal disease in Europe, I included it in this study.

Diet is reflected in the oral health of a population (Larsen et al., 1991). A variety of dental pathological conditions provide general insight into the diet, variation in diet, and dietary change. Four main dental pathological conditions, dental caries, antemortem tooth loss, periapical lesions, and dental calculus, were chosen for this study, because diet can be a major factor in the development of each of them (Hillson, 1996). In addition to these pathological conditions, I assessed the skeletal samples for degree of dental wear, because tooth wear is also indicative of diet (Hillson, 1996).

Activity patterns and lifestyle can also be assessed by a number of variables. In this study, I chose to examine the presence and severity of DJD on all major joints, because DJD is influenced by physical activity and biomechanical stress (Bridges, 1992). As a result, DJD provides insight into the patterns of activity of a population and, hence, the lifestyle of that population. I also included an assessment of trauma in this study in order to gain more insight into the lifestyle, in general, and interpersonal violence, in particular, as traumatic injuries of both violent and non-violent origin reflect the type of social and physical environment of the population (Lovell, 1997). Those populations involved in great amounts of physical activity as part of their daily lifestyle may be expected to have more traumatic injuries, which, in turn, would also impact the overall health of the population.

Together, these skeletal markers and pathological conditions reflect the health and lifestyle of a past population. The use of a variety of skeletal indicators provides a more thorough understanding of what life was like in medieval Poland. Assessment of these markers will enable me to test the main hypothesis of this dissertation as well as the four specific hypotheses described in Chapter 2. The following will examine each skeletal indicator in more detail, describing the etiology of the marker, its skeletal manifestation, and its implication for assessments of health and lifestyle.

Skeletal Indicators of Health: Systemic Stress

In assessing the health of past populations, anthropologists must consider one of its most fundamental aspects: stress. Stress is generally considered the culmination of environmental perturbations, cultural buffers, and physiological buffers (Huss-Ashmore et al., 1982; Goodman et al., 1988). When environmental stresses surpass the cultural and physiological buffers, there is a disruption in the normal functioning of the organism. The disruption may be extensive if the stress is severe and the organism is unable to mount an effective response (Huss-Ashmore et al., 1982). Evidence of these physiological disruptions, especially those that are severe or of long duration, can be found on the human skeleton and measured to assess stress and adaptation in past populations (Goodman et al., 1988; Larsen, 1997).

The skeleton is responsible for many functions, such as protecting vital organs, supporting muscles, and producing red blood cells. The building blocks of bone, osteons, are deposited and resorbed throughout life according to the needs of the body (Goodman et al., 1988). For example, during growth, more bone is deposited than resorbed in order to increase the overall size of each skeletal element. When the organism is stressed the functions of the skeletal system may be impaired, and in some cases, the stress episode leaves unique evidence, which anthropologists can use to identify the source of stress (e.g., porotic hyperostosis and cribra orbitalia). Alternatively, there may be a general skeletal response that anthropologists regard as a nonspecific indicator of stress (e.g., enamel hypoplasias) (Goodman et al., 1988). In this study, porotic hyperostosis, cribra orbitalia, and enamel hypoplasias were examined in order to assess the level of systemic stress in the population. The scoring system used for these indicators is located in Appendix A.

Porotic Hyperostosis and Cribra Orbitalia

Anthropologists often consider porotic hyperostosis and cribra orbitalia as indicators of iron deficiency anemia, although these markers may have other, less-common etiologies, such as hemolytic anemia and thalassemia (Lallo et al., 1977; Stuart-Macadam 1987a, 1989a, 1992a, b; Schultz, 1993, 2001). Iron is an important element found in blood, as it assists in oxygen transport to tissues throughout the body. Iron deficiency, which can have detrimental consequences, results from a number of factors, including malnutrition, blood loss, parasitic infection, and disease (Stuart-Macadam, 1989a, 1992b). A deficiency in iron produces an associated increase of red blood cell production in the marrow cavities to compensate for the decreased level of oxygen available to tissues. The resulting expansion of the marrow cavities in thin, flat bones such as cranial and orbital bone causes the external, compact bone to erode, creating a porous surface on the cranial vault (porotic hyperostosis) and in the eye orbits (cribra orbitalia) (Stuart-Macadam, 1987b; Figure 3.7). The relationship between the cranial vault and orbital lesions is not clear; however, clinical and anthropological studies suggest there is a common etiology due to their co-occurrence in many samples (Stuart-Macadam, 1989b). In addition, some researchers assert the vault lesions represent a more severe form of anemia (Stuart-Macadam, 1989b).

Although lesions are found on adult and subadult skeletons, many anthropologists argue that these stress indicators are reflective of a childhood condition (Lallo et al., 1977; Stuart-Macadam, 1985; Larsen, 1997). The marrow cavities of young children are completely filled with red marrow; any expansion of cranial diploë from increased red blood cell production quickly affects the surrounding compact bone (Stuart-Macadam, 1985). In older children and adults, much of the red marrow has been replaced by fatty, yellow marrow. The yellow marrow cavities provide space into which the red marrow can expand without affecting the adjacent bone. Most anthropologists regard healed lesions on adult skeletons as indicative of a condition from which they had recovered well before death (Larsen, 1997).

Porotic hyperostosis was scored from the parietal bones, where it is most often expressed. Only one parietal was needed for scoring, but if both parietals were present, the more severe form of the condition was recorded. Cribra orbitalia was scored from the eye orbits, but only one orbit was needed for scoring. If both orbits were present, the

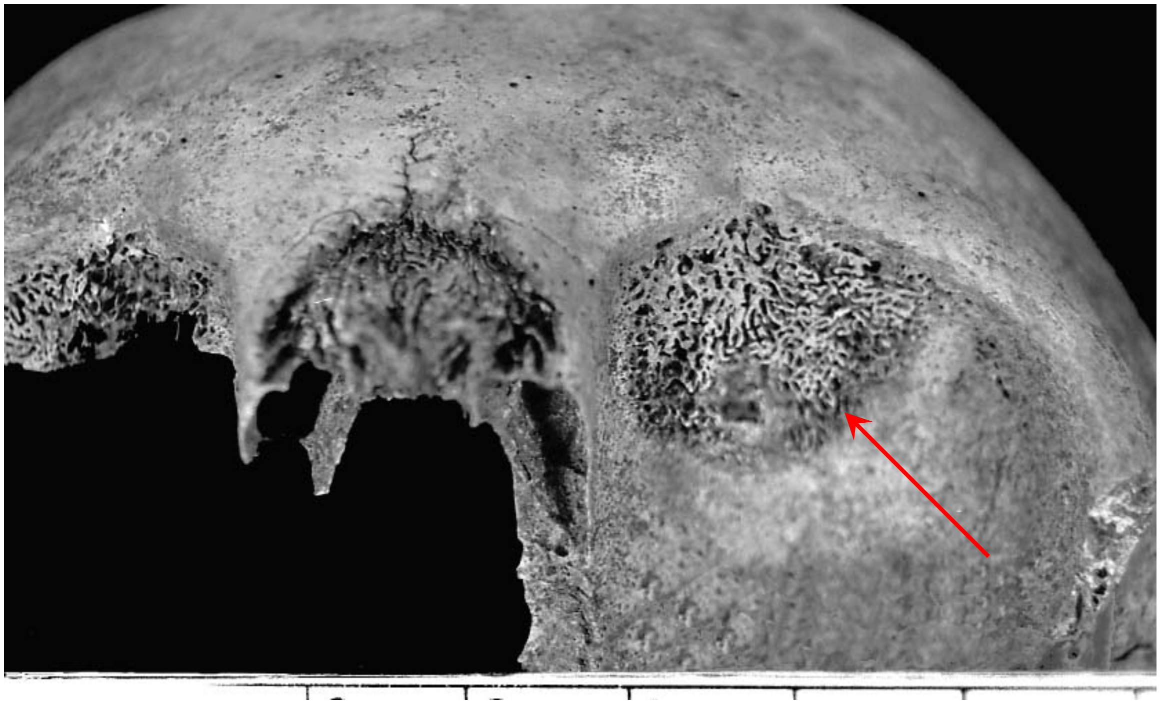

Figure 3.7. Cribra orbitalia (Śródka burial 100)

more severe form was recorded. The scoring details for both skeletal indicators are in Appendix A.

Enamel Hypoplasias

Enamel hypoplasias are indicators of growth disruption during dental development and are visible on teeth as areas of enamel deficiency. Enamel matrix is laid down at a regular rate by ameloblasts, beginning at the cusps, and terminating at the cementoenamel junction (Goodman et al., 1980; Goodman and Rose, 1990; Huss-Ashmore et al., 1992). Stress-induced metabolic disturbances can cause a reduction or interruption in this process, leading to grooves or pits of diminished or missing enamel (Figure 3.8). Most of these hypoplastic defects are oriented horizontally across the tooth, and multiple grooves reflect multiple stress episodes. Like porotic hyperostosis and cribra orbitalia, these stress markers are indicative of a childhood condition, as tooth formation is complete before adulthood. These defects are a permanent record of stress episodes, as enamel, unlike bone, does not remodel (Goodman et al., 1980; Goodman and Rose, 1990; Huss-Ashmore et al., 1992). However, if the tooth becomes severely worn on the occlusal or buccal/labial surface, the defect may be lost. Both deciduous and permanent teeth can be affected; however, anterior teeth have more opportunity to develop a hypoplastic defect due to the geometry of tooth crown growth, likely accounting for the greater rate of defects on anterior teeth ((Hillson and Bond, 1997). Typically, all teeth forming at the time of the metabolic disturbance are affected, and the location of the defects provides an approximate timing of the stress episode (Goodman and Rose, 1991; Hillson, 1996). The etiological factors implicated in the occurrence of a growth disruption and resulting hypoplastic defect, include disease,

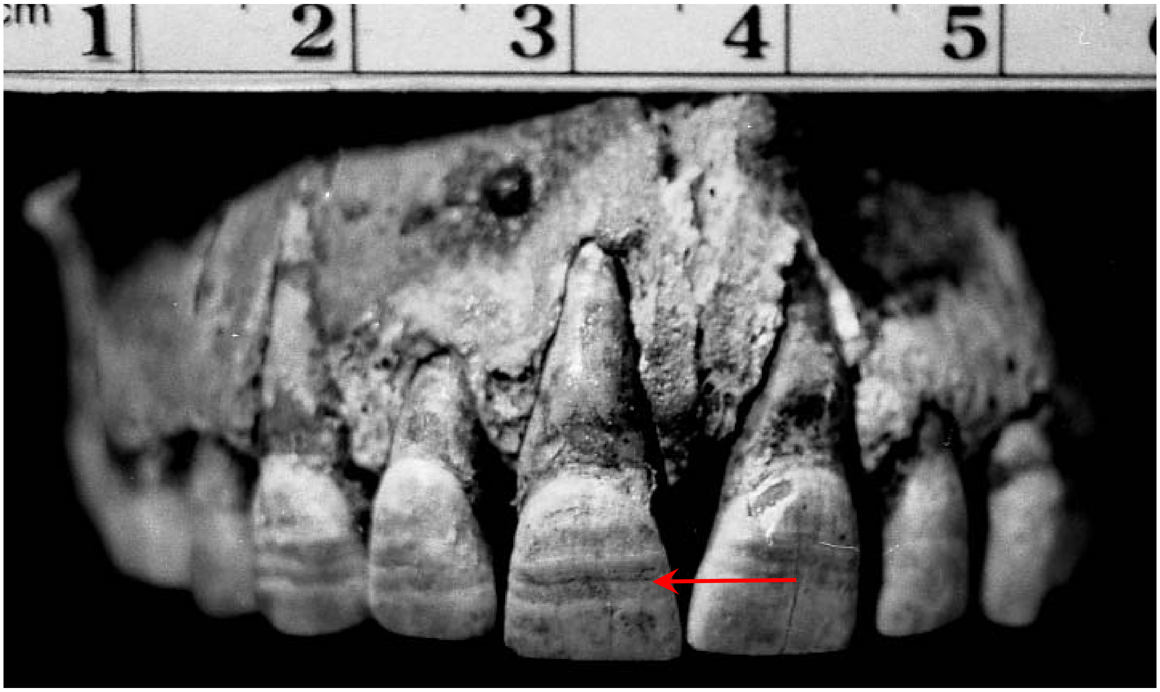

Figure 3.8. Enamel hypoplasias of maxillary dentition (Śródka burial 8)

malnutrition, direct trauma, and hereditary conditions (Goodman and Rose, 1990, 1991; Huss-Ashmore, 1992; Hillson, 1996, 2000; Roberts and Manchester, 2005). However, malnutrition and disease appear to be a far more common cause of these defects, as hereditary defects and localized trauma are relatively rare occurrences (Goodman and Rose, 1990, 1991).

Enamel hypoplasias were recorded for permanent maxillary and mandibular incisors and canines, as they are most commonly affected. Only hypoplastic lines were considered evidence of hypoplasias; pitting was not included. At least 50% of the crown was required for scoring. When both right and left teeth were present, scores were recorded for the left side. More details of the scoring system are located in Appendix A.

Summary

Together, these skeletal indicators of systemic stress provide insight into one aspect of health and well-being in a past population. Anthropologists have long been advocating the use of multiple stress indicators as a means to provide several lines of evidence supporting the same conclusion (Huss-Ashmore et al., 1982; Goodman and Armelagos, 1989). If only a single indicator is used, the data may give a skewed view of health; however, the use of several types of stress markers prevents conclusions being drawn from anomalous results. Yet, health is not simply an assessment of stress indicators on the skeleton. Infection and diet contribute significantly to the health of an individual and of a population, as well as activity patterns and traumatic injuries (Larsen, 1997). To gain a proper perspective on health in the medieval Polish population, data are needed from these additional sources.

Skeletal Indicators of Health: Infection

Infection can be bacterial, viral, fungal, or parasitic in nature. Throughout human history, these pathogens have been responsible for the majority of human deaths (Roberts and Manchester, 2005). Not all people or populations, however, contract these infections, which may be due to a variety of factors that determine an individual's and a population's susceptibility to infection (Inhorn and Brown, 1997). Factors such as age, sex, and nutritional status can influence whether an individual will contract and develop a particular infection (Inhorn and Brown, 1997), while environmental conditions, such as climate, sanitation, pollution, and contact with other populations will affect the susceptibility of a population. In addition to individual and population-specific factors that influence vulnerability to infection, characteristics of the pathogens themselves, such as pathogenicity of the organism and mode of transmission, may also influence infection rates (Inhorn and Brown, 1990).

Historically well-documented infectious diseases, such as the plague, influenza, and smallpox, are not usually diagnosed from human skeletal remains, because these diseases run their course rapidly and victims die before their skeletons become affected (Roberts and Manchester, 2005). In addition, some types of pathogen infection may simply not lead to disease, and the skeleton, therefore, bears no evidence of it. Other types of infection do affect the skeleton, although the specific cause is not always known. While researchers may not be able to discern a particular pathogen responsible for nonspecific infections, such as periostitis, there are three main specific infectious diseases which leave characteristic skeletal markers that anthropologists use to make a differential diagnosis: leprosy, treponematosis, and tuberculosis. These infectious diseases often involve multiple skeletal elements resulting from chronic and/or severe infections. The pattern of skeletal involvement is specific to each disease, making them more readily identifiable by researchers (Roberts and Manchester, 2005). The presence of skeletal indicators of specific infectious diseases provides anthropologists with a record of disease for past populations. However, it is important to note that the prevalence of these diseases gives only a minimum estimate, as some individuals will not have skeletal evidence of their infections (Roberts and Manchester, 2005). These individuals may have had a relatively minor infection or a healthy immune response, preventing any lasting effects, or they may have died shortly after infection. In this study, the skeletal remains were assessed for the presence of periostitis, leprosy, treponematosis, and leprosy. These pathological conditions were chosen, because they can affect bone, leaving a record of the disease or infection. Additionally, leprosy and tuberculosis were substantial threats to health in medieval Europe, and treponemal disease may have posed a risk to the population (Roberts and Manchester, 2005). The scoring system for each is in Appendix A.

Periostitis

Periostitis is an inflammatory reaction of the periosteum in conjunction with bacterial infection or trauma (Lambert, 1993; Larsen, 1997; Ortner, 2003; Roberts and Manchester, 2005). Periostitis may be referred to as nonspecific infection, because it is often difficult to determine its exact etiology. Osteoblasts, or bone-forming cells, line the inner layer of the periosteum, a highly vascularized, thin sheath of fibrous tissue that tightly adheres and provides nourishment to the bone (Eyre-Brook, 1984; Simpson, 1985). Injury and disease causing pus or blood formation push the periosteum away from the surface of the bone, stimulating the osteoblasts to deposit new areas of bone on the surface of long bones, such as the tibia (Lambert, 1993). These bony changes are visible with the unaided eye and can range in severity from fine pitting and longitudinal striations to large areas of osseous plaques (Ortner, 2003; Roberts and Manchester 2005; Figure 3.9). The plaque-like deposits consist of unorganized woven bone, creating an irregular surface with well-defined margins (Larsen, 1997; Ortner, 2003). Periosteal reaction can occur on a single bone or multiple elements, which may indicate whether the etiology was traumatic or infectious. The tibia is most often involved, which some anthropologists suggest is a function of its location close to the surface of the skin, a region that is highly vulnerable to traumatic injury (Roberts and Manchester, 2005). Others propose the tibial surface is cooler than other areas of the body and therefore, more susceptible to bacterial infection. Additionally, gravity causes blood to pool in the lower legs, allowing bacteria to accumulate in those areas (Roberts and Manchester, 2005).

At its most severe, skeletal infection may affect both the periosteal and endosteal surfaces of the bone. Osteomyelitis is an infection involving bone formation, bone destruction, and pus formation. Unlike periostitis, osteomyelitis is also accompanied by bone formation on the endosteal surface, which may effectively reduce the diameter of the medullary cavity. The overall size of the bone may become enlarged and deformed due to uneven bone deposition (Roberts and Manchester, 2005). Bone destruction causes pitting and irregular changes to the bone surface and creates a cavity within the bone in which an abscess is formed, often containing pyogenic bacteria such as *Staphylococcus aureus*. As bacteria produce pus, a sinus develops connecting the abscess to the external

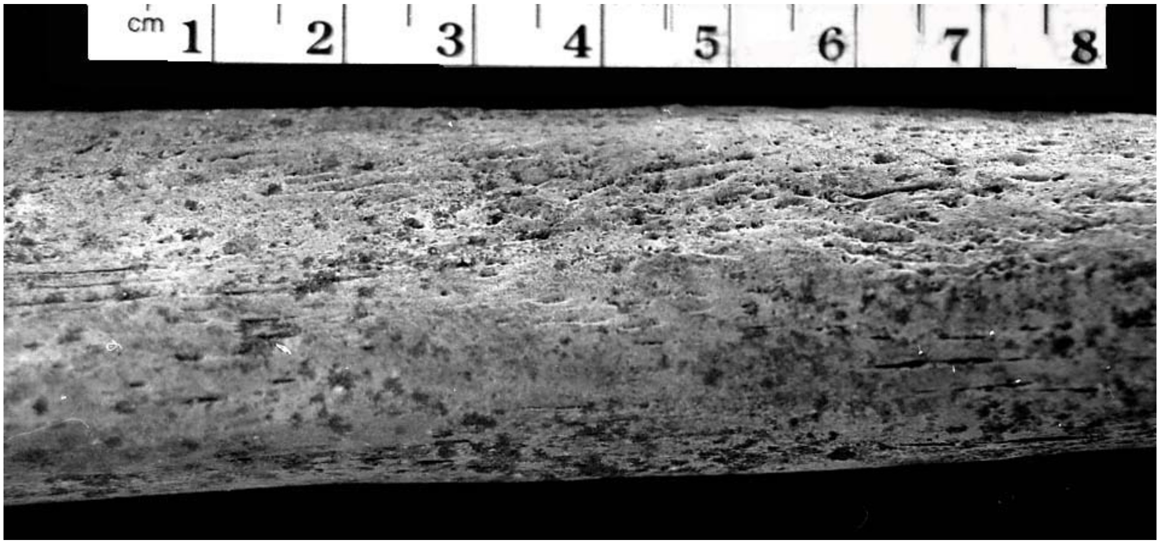

Figure 3.9. Periostitis of left tibia (Śródka burial 20)

surface of the bone. The cloaca visible on the outer surface of the bone serves as a pathway for pus to be drained (Ortner, 2003; Roberts and Manchester, 2005).

While a specific etiology for periostitis and osteomyelitis may not be discernable, the presence of any degree of infection indicates a general health problem. Most often, periostitis does not lead to death, as the infection is localized to the outer cortical surface of bone. Osteomyelitis, however, may be fatal if the infection spreads to the heart, lungs, or other vital organs through the circulatory system (Larsen, 1997). Regardless of cause, periostitis and osteomyelitis are useful indicators of a population's health. Increases in the prevalence of periostitis may reflect an overall decline in community health (Armelagos, 1990; Larsen, 1997). Unlike enamel hypoplasias and porotic hyperostosis, periostitis can occur at any age and, therefore, reflect health of all segments of the population. This feature makes periostitis and osteomyelitis especially useful in assessing community health.

Periostitis was scored for each element that was present in the skeletal inventory, including all long bones and the clavicles. Periostitis scores were recorded separately for right and left elements. Incomplete bones were scored for periostitis, as long as a portion of the shaft was present. More complete scoring details for periostitis are in Appendix A.

<u>Leprosy</u>

Leprosy, or Hansen's disease, is a chronic infectious disease caused by *Mycobacterium leprae* that is transmitted through contact with skin lesions or through inhalation of droplets containing the pathogen that are coughed or exhaled into the air by infected individuals (Roberts and Manchester, 2005). While leprosy is infectious, it does not always lead to disease; in general, an individual becomes infected only after prolonged exposure and often does not present any physical signs or symptoms of the disease for 2-5 years, owing to the very long incubation period (Ortner, 2003; Roberts, and Manchester, 2005). Although the disease is sometimes found in members of the same family, it is not inherited (Roberts and Manchester, 2005); instead, family members living in close proximity to one another may be routinely exposed to the microorganism, making it more likely that related persons in the same household become infected.

Leprosy varies in expression from a mild, or tuberculoid, infection (also known as high-resistance leprosy) to the most severe infection, referred to as the lepromatous type (also known as low-resistance leprosy) (Andersen et al., 1994; Ortner, 2003). Skeletal involvement can occur with any degree of infection, but it is most acute in the lepromatous form. However, the skeleton is not affected in most cases; only 5% of individuals with leprosy develop bony lesions (Ortner, 2003). The earliest stages of the disease involve peripheral nerves, both motor and sensory, which lose their function. Without sensation to the extremities, most often hands and feet, injuries may go unnoticed and become infected. Repeated trauma to the extremities can lead to capillary damage and, eventually, aseptic necrosis of the soft tissue, which provides a route of invasion for other bacteria (Andersen et al., 1994). Secondary infection of the bones of the hands and feet can result, as the bone is infected via a hematogenous route or through direct extension from soft tissue lepromas (i.e., lesions of leprosy) (Andersen et al., 1994; Ortner, 2003; Roberts and Manchester, 2005). Osteomyelitis of the bones of the hands and feet often results, which leads to deterioration and collapse of subchondral bone, creating characteristic deformities (Andersen et al., 1994; Figure 3.10).

Figure 3.10. Resorption of distal aspect of metatarsals (Śródka burial 47)

Changes in the bones of the face can accompany lepromatous leprosy and are collectively known as the rhinomaxillary syndrome or 'facies leprosa' (Møller-Christensen et al., 1952; Møller-Christensen, 1961, 1978; Andersen and Manchester, 1992). *Mycobacterium leprae* prefers cooler areas of the body, leading to infection of mucosal tissues. Infection of the nasal area causes skeletal changes, such as loosening of the chondro-osseous junction at the bridge of the nose, which results in the characteristic 'saddle-nose' deformity. The nasal septum and hard palate are often perforated, and the anterior nasal spine, nasal aperture margins, and alveolar process of the maxilla are resorbed, the last of which leads to the loss of anterior maxillary teeth (Andersen and Manchester, 1992; Andersen et al., 1994; Figure 3.11).

Leprosy was scored for two main regions of the skeleton: the nasal area of the face and the fingers and toes, including the phalanges, metacarpals, and metatarsals. To record leprosy for the nasal region of the facial bones, only one maxilla needed to be present. More complete details of the scoring system are in Appendix. A.

Treponematosis

Treponematosis, caused by the bacteria of the *Treponema* genus, comprises four separate syndromes: pinta, yaws, endemic syphilis (also known as bejel), and venereal syphilis (Aufderheide and Rodriguez-Martin, 1998; Ortner, 2003; Roberts and Manchester, 2005). There is some debate about whether these four syndromes represent four different species of the genus *Treponema* or whether they are different manifestations of the same microorganism. All but pinta can affect the skeleton, however, it is difficult to differentiate among the three based on skeletal involvement alone. Like *Mycobacterium leprae*, the treponemal bacteria prefer cooler areas of the body, such as

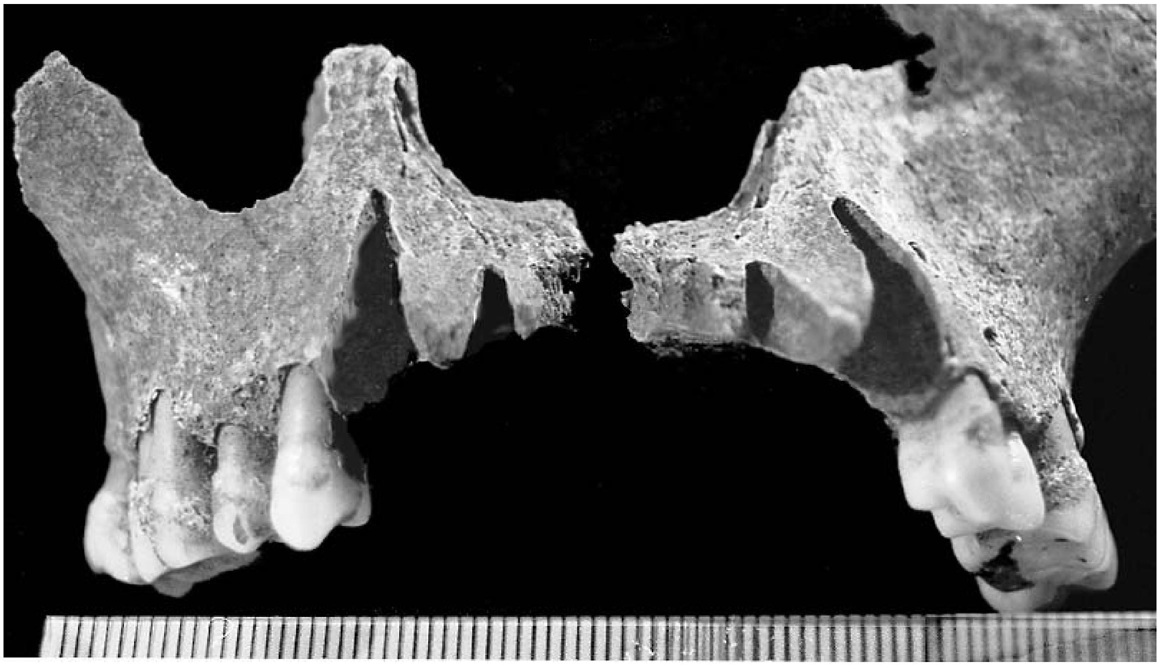

Figure 3.11. Nasopharyngeal lesions (Śródka burial 33)

the cranium, tibiae, and facial bones (Ortner, 2003). This disease can be transmitted through direct contact with skin or mucous membrane lesions, sexual contact, or through the placenta, depending on the syndrome (Larsen, 1997). The initial phase of the disease involves infection, while the next phase includes the spread of the pathogen through the body via a hematogenous route as well as development of early symptoms of the disease, such as lesions of the skin and other soft tissues. In this latter stage, there may be an inflammatory response on the periosteal surface of the bones, involving bone destruction and bone production. The reaction on the skeleton is referred to as a gumma, and in later stages, the overall shape of the bone may be altered (Roberts and Manchester, 2005). A tertiary stage of treponemal disease is associated, in particular with venereal syphilis and will be described below. Bone involvement ranges between 5 and 20 percent, depending on the syndrome; venereal syphilis has the highest rate of involvement (Roberts and Manchester, 2005).

Yaws is considered a childhood infection and typically involves periosteal inflammation on the bones of the hand, the radius and ulna, and the tibia and fibula, although the tibia is most commonly affected (Aufderheide and Rodriguez-Martin, 1998; Ortner, 2003; Roberts and Manchester, 2005). This syndrome is spread through casual contact with lesions on the skin or mucous membranes (Aufderheide and Rodriguez-Martin, 1998). In severe cases of yaws, bone apposition on the anterior middle third of the tibia can create a bowed appearance of the bone, which is called “saber-shin” (Larsen, 1997; Ortner, 2003; Roberts and Manchester, 2005). The hard palate may be perforated, and the bones of the face, especially around the nasal aperture, may be affected. In some cases, the entire nasal and maxillary area are destroyed in conjunction with loss of the overlying facial soft tissues; this condition is known as gangosa and it can be more extensive and severe than the analogous effects of leprosy (Roberts and Manchester, 2005). Crater-like cranial lesions can develop that have a focal area of bone destruction surrounded by an area of bone formation; once healed, they take on a star-shaped appearance. These characteristic lesions are called caries sicca, and their presence on a skeleton are generally considered pathognomonic of a treponemal infection (Ortner, 2003). Usually, only a few of these lesions are present in cases of yaws, although there are some instances of more severe involvement (Roberts and Manchester, 2005).

Endemic or nonvenereal syphilis has similar skeletal involvement; cranial involvement is rare, but caries sicca may be present. Like yaws, the tibia is often affected and saber-shins are common (Ortner, 2003; Roberts and Manchester, 2005). Children are most often infected, although some adults retain the skeletal evidence. The infection is spread through contact with lesions of the skin or mucous membrane. Endemic syphilis refers to a disease that is constantly present in a population at a low rate; a small percentage of people are infected at any given time, but there is not widespread infection characteristic of epidemic levels. The main difference between endemic syphilis and yaws is geographical variation; yaws tends to be found in hot, humid areas, while endemic syphilis is found in drier regions (Aufderheide and Rodriguez-Martin, 1998; Ortner, 2003; Roberts and Manchester, 2005).

Venereal syphilis, which is transmitted through sexual contact, has a number of differences from yaws and endemic syphilis. It generally afflicts adults, and it can have severe effects on the circulatory system and the central nervous system. Venereal syphilis has the highest rate of skeletal involvement, which can appear up to ten years after initial infection (Ortner, 2003; Roberts and Manchester, 2005). In the tertiary stage, extensive skeletal involvement occurs; the gummas take on a granulomatous appearance and large areas of the cranium, especially the frontal and parietal bones, are affected. In prolonged cases of tertiary syphilis, the surface of the cranium takes on an undulating appearance, as the many lesions coalesce, and perforation of the skull can occur (Ortner, 2003; Roberts and Manchester, 2005). Like yaws and endemic syphilis, the tibia continues to be involved in most cases; however, unlike the other syndromes, joint involvement is also common, such as the knee, shoulder, and elbow (Aufderheide and Rodriguez-Martin, 1998; Ortner, 2003; Roberts and Manchester, 2005). Bones surrounding the nasal area and hard palate are also affected in tertiary syphilis, but to a lesser degree than that observed in yaws and endemic syphilis (Roberts and Manchester, 2005).

Venereal syphilis is also unique in that it can be transmitted congenitally. The specific suite of characteristics associated with congenital syphilis enable researchers to diagnose it as such. In addition to saber shin, infants with this form of treponemal disease have Hutchinson's incisors and Moon's molars, which are developmental defects in tooth enamel. Many infants do not survive the disease and die before extensive evidence of the syphilitic infection accumulates on the skeleton (Cook, 1994; Hillson et al., 1998; Roberts and Manchester, 2005).

Treponemal disease was scored from the nasal region of the cranium and the cranial vault. Only one maxilla needed to be present for treponemal disease to be assessed and recorded. A partial cranium was scored for this disease as well, as long as some portion of the frontal bone was present, as it is most commonly affected. Further scoring details are in Appendix A.

Tuberculosis

Tuberculosis is a chronic disease caused by a complex of species within the genus *Mycobacterium*, especially *Mycobacterium tuberculosis*. This pathogen is closely related to the bacteria that cause leprosy (*Mycobacterium leprae*). It is principally transmitted through inhalation of bacteria-laden droplets that are coughed or sneezed into the air by an infected individual (Roberts and Buikstra, 2003; Roberts and Manchester, 2005). Like leprosy, prolonged or continued exposure to tuberculosis may be required before infection occurs (Roberts and Buikstra, 2003; Roberts and Manchester, 2005). The initial infection is in the lungs and, in many cases, does not lead to full development of the disease (Ortner, 2003). To a lesser degree, the stomach and intestinal tracts may be the first organs infected, although this tends to be associated with *Mycobacterium bovis*, a closely related pathogen (Roberts and Manchester, 2005). Upon re-exposure or lack of healing of the primary infection, the bacteria may be distributed via the circulatory system to various other parts of the body, including the skeleton. As with leprosy, there can be a very long incubation period, during which the individual does not express symptoms of the disease, and there can be five or more years between the primary and secondary infections. Skeletal involvement is rare in tuberculosis, but when it does occur, specific skeletal elements and joints are affected (Ortner, 2003; Roberts and Buikstra, 2003). Since the pathogen is spread through the circulatory system, the bacteria tend to be found in areas with a high red marrow component and a copious blood supply, which are in the cancellous bone of epiphyses and metaphyses. Typically, the vertebrae, ribs, and sternum are affected due to their high red marrow content, and in children, bones of the hands and feet are also common areas of infection (Ortner, 2003). The prevalence of epiphyseal involvement leads to affected joints, most often hip, knee, elbow, and ankle; however, vertebral tuberculosis is the most common lesions found in individuals suffering from the disease (Ortner, 2003).

Vertebral bodies are especially susceptible to tuberculosis, as they contain large amounts of red marrow. The vertebral arches and spinous processes are rarely involved, owing to their lack of marrow. Lytic lesions of the anterior portion of the body can compromise the structure's integrity, leading to collapse; a wedge-shaped portion of the vertebra is usually all that remains. The collapse of one or more contiguous vertebrae leads to a characteristic anterior bending deformity of the spinal column, termed kyphosis or Pott's disease (Ortner, 2003).

The ribs are another area commonly affected in tuberculosis. Proliferative lesions on the pleural surface of ribs are related to chronic pulmonary disease, which includes pulmonary tuberculosis (Kelley and Micozzi, 1984); however, these lesions are not diagnostic of tuberculosis (Larsen, 1997). Joints, such as the hip, may be affected, leading to destruction of the joint cavity and possible dislocation (Ortner, 2003). For some joints, these effects can lead to more severe consequences. For example, if the pelvis of a female becomes deformed due to destruction of the sacroiliac joint, there may be complications for childbearing (Micozzi, 1982).

Tuberculosis was scored for the vertebrae and ribs. At least one thoracic or lumbar vertebra was needed for scoring tuberculosis of the vertebral column. Likewise, at least one rib was needed for scoring tuberculosis of the ribs. More complete scoring details are in Appendix A.

Summary

Periostitis reflects a general health problem in a population, while specific infectious diseases represent particular factors in compromised health. An increase in periostitis in a population indicates a decrease in community health, as more individuals are affected by pathogens (Armelagos, 1990). Likewise, increases in specific infectious disease reflect an increase in pathogen load in the population and an overall decline in health. Although these infectious diseases affect the skeleton in only a small number of individuals, they continue to be an important source of information about exposure to pathogens and general health in past populations (Roberts and Manchester, 2005). The presence of a unique suite of lesions enables anthropologists to differentially diagnose leprosy, treponematosis, and tuberculosis. Prevalence of these diseases, of course, provides only a minimum estimate of the number of individuals actually infected; many may have survived the infection without any skeletal evidence, while others may have died quickly before skeletal lesions could form. In either case, infected individuals without skeletal lesions cannot be included in the prevalence rate for a population (Roberts and Manchester, 2005). In some ways, the presence of skeletal markers may be evidence of people’s strong immune response; they survived the initial infection and lived long enough for their skeletons to become affected (Ortner, 1991).

Although infection provides insight into the health of a past population, it is also important to consider the diet and nutrition of that population, as malnutrition and disease have a synergistic effect (Powell, 1988). When the diet is not sufficient to fulfill the nutritional needs of an individual or a population, the immune system is compromised and there is a greater risk of infection. Alternatively, when nutritional demands are met, the immune system is more effective in warding off pathogens. Like systemic stress and infection, then, diet plays an important role in the health and well-being of a population.

Skeletal Indicators of Health: Diet

Dental remains are important in assessing the health and lifestyle of past populations, because they display evidence of physiological stress (enamel hypoplasias, as described above) and diet. Dietary patterns are reflected in the dentition through the pattern and prevalence of several dental pathological conditions, such as dental caries, antemortem tooth loss, periapical lesions, and dental calculus, as well as dental wear (Kelley et al., 1991; Larsen, et al., 1991; Roberts and Manchester, 2005). Not only can such data provide information about the types of foods being consumed in the population, but these data also offer insight into food preparation techniques (Powell, 1985). Teeth are in direct contact with all materials that are consumed, and as a result, they can be affected by variation in texture, acidity, and quantities of food (Hillson, 1996). Due to their hard and tough nature, teeth may be the only remains of an individual, which makes them essential to any bioarchaeological analysis (Hillson, 1996).

In this study, the skeletal remains were examined for the presence of carious lesions, antemortem tooth loss, dental calculus, periapical lesions, and the degree of dental wear. These dental indicators were chosen, because diet plays an etiological role in each of them (Hillson, 1996); therefore, they are good indicators of diet. Dental caries and periapical lesions were recorded by the number of permanent teeth affected. Additionally, carious lesions were recorded by specific tooth affected, size of lesion, and tooth surface affected. Antemortem tooth loss was recorded by the total number of permanent teeth lost, as well as the specific tooth that was lost. Dental calculus was recorded by number of permanent teeth affected, specific tooth affected, and severity of calculus. Dental wear was recorded for permanent maxillary and mandibular first and second molars. Both right and left molars were scored separately. Scoring details for dental caries, dental calculus, and dental wear are in Appendix A.

Dental Caries

Dental caries is a disease process that results in the progressive demineralization of dental tissues by acid-producing bacteria (Rowe, 1982; Powell, 1985; Hillson, 1996). The organic acids that destroy enamel and other dental tissues are the byproduct of carbohydrate fermentation. Bacteria in the genera *Streptococcus* and *Lactobacillus*, which are commonly implicated in the etiology of caries, metabolize carbohydrates like sugar that enter the oral cavity. These bacteria strongly adhere to the enamel surfaces, and, if not removed through brushing or other cleaning methods, the bacteria can accumulate into a visible layer called plaque (Hillson, 1979; Newbrun, 1982; Rowe, 1982). The severity of dental caries varies; the resulting lesions range in size from small, pinpoint sized holes to complete loss of the crown and root (Larsen, 1997). Although diet is one of the strongest etiological factors in cariogenesis, there are several other factors that can influence the rate of the disease process and the distribution of the lesions, including tooth morphology, dental wear, oral pH, salivary composition, heredity, food texture, and oral health practices (Rowe, 1982; Powell, 1985). Certain dietary minerals, such as calcium phosphate, which are increased through some food preparation methods, actually inhibit dental caries. Like all infectious diseases, host susceptibility and immune response also play an important role in determining the effects of this disease process (Powell, 1985).

Tooth morphology is a principle determinant in carious lesion location, as deep fissures or pits on the occlusal surface of molars and premolars provide an ideal area in which food particles can become trapped and decay (Powell, 1985). The trapped food enhances the activity of cariogenic bacteria, increasing the likelihood of a carious lesion. Smooth dental surfaces are less prone to the activity of caries-causing bacteria, as these surfaces are more easily cleansed of food particles (Powell, 1985). This feature also explains why there often is an inverse relationship between caries rate and dental wear. As teeth become worn, the occlusal surface becomes flattened as the fissures and pits are evened out. The resulting smoother surface is less caries-prone (Powell, 1985; Maat & Van der Velde, 1987; Hillson, 1996). However, this relationship is not always true. In some cases, there is a positive correlation between caries and wear due to a diet that is not only highly cariogenic, but also causes a great amount of wear (Meiklejohn et al., 1992; Larsen, 1997). While smooth surfaces are less prone to carious lesions, cavities can still occur on the lingual and labial/buccal surfaces of teeth, as well as in interproximal areas where food particles can become lodged (Rowe, 1982).

Periapical Lesions

Periapical lesions or abscesses are areas of resorption in the alveolar bone around the apex of tooth roots. These lesions form as the result of pulpal inflammation, bacteria, and bacterial-produced toxins moving down the root canal and through the apical foramen or accessory foramina. The surrounding periodontal tissues have an inflammatory response to the presence of bacteria, and the alveolar bone is resorbed (Hillson, 1996; Alt et al., 1998). Initially, the inflammation begins in the pulp cavity in response to bacteria introduced through dental caries, attrition, or tooth fracture. Pulpitis may be an acute or chronic infection that eventually leads to pulp death, causing pus to be produced (Alt et al., 1998; Hillson, 2000). Once the periodontal tissues are affected, granulation tissues form, creating a periapical granuloma, which in more chronic cases, causes the resorption of alveolar bone in its vicinity (Hillson, 1996, 2000). These periapical abscesses also serve as drainage sinuses for pus produced by the inflammatory response, relieving the pressure created by suppuration between the tooth and the surrounding bone (Alt et al., 1998). A fistula or tunnel forms to drain the pus to the nasal cavity or maxillary sinus (Hillson, 1996). In skeletal remains, periapical lesions are identified by the rounded cavitations in the alveolar bone near the apical region of a tooth. If the tooth is still present, the apex is often visible through this abscess. Infection in the periapical region may lead to tooth loss (Alt et al., 1998)

Antemortem Tooth Loss

Antemortem tooth loss is associated with dental caries and periodontal disease (Larsen, 1997). In periodontal disease, there is often a loss of alveolar bone, especially at the alveolar crest. Substantial horizontal bone loss reduces the amount of bone available to anchor teeth in their sockets and can eventually lead to tooth loss (Hillson, 1996). The remaining soft tissues heal over and the tooth sockets remodel, often leaving no evidence of the former hole in the alveolar bone (Larsen, 1997). Researchers identify antemortem tooth loss through the presence of partially or completely remodeled tooth sockets. Specific etiologies of antemortem tooth loss are problematic, as evidence may have been lost, especially in instances of carious teeth; however, the close association between periodontal disease, dental caries, and antemortem tooth loss is well established, especially in archaeological populations (Larsen, 1997).

The prevalence of antemortem tooth loss contributes to the overall picture of oral health in a population. In general, antemortem tooth loss is most frequent in the posterior dentition and, often occurs more often in mandibular teeth (Hillson, 1996; Larsen, 1997). The rate of loss, however, may not be entirely representative of an oral pathological condition. In some instances, teeth may be lost as part of the aging process, such as continual or super-eruption (Hillson, 1996; Larsen, 1997). Furthermore, antemortem tooth loss has been found to be age-progressive, as rates of tooth loss increase with increasing age (Hartnady and Rose, 1991). The presence of antemortem tooth loss in an individual or a population may also undermine estimates of dental caries, as teeth with severe carious lesions may be lost.

Dental Calculus

Calculus is mineralized plaque on tooth surfaces. Plaque is one of the most predominant problems affecting teeth, as its accumulation can lead to other problems, such as dental caries (Hillson, 1996). Plaque is an accumulation of microorganisms, which are found throughout the mouth on the lips, tongue, gums, and cheeks. While the soft tissues of the mouth shed the outer layers on a regular basis, thereby preventing the accumulation of these microbes, the smooth hard surface of the teeth present an ideal location for buildup of microorganisms (Hillson, 1996). Certain areas are more prone to plaque than others, such as fissures and pits, because saliva is able to cleanse teeth of these microbes only to a limited degree. In fact, as saliva coats the surface of teeth, plaque bacteria can adhere to it and obtain needed nutrients from the saliva (Hillson, 1996). As food passes through the mouth, particularly carbohydrates, the plaque bacteria are able to obtain more nutrients, eventually increasing the bacterial colony on the tooth (Hillson, 1996).

Over time, if the plaque is not removed through oral hygiene practices or other methods, it can become mineralized. The minerals, including apatite and brushite, are found in the plaque fluid and in saliva (Hillson, 1996). As a result, those areas of the dentition that are mostly closely located to salivary ducts tend to have the greatest accumulation of plaque and, hence, calculus. These areas include the lingual surface of the incisors and canines and the buccal surface of molars and premolars (Hillson, 1996). Calculus has two predominant forms: supra-gingival found on tooth crown and sub-gingival located on the surface of the root (Hillson, 1996). The supra-gingival form of calculus often has the most substantial amounts mineralized plaque, in some cases covering the entire buccal or lingual surface of the crown. The etiology of either form of calculus involves diet, carbohydrate consumption in particular, and oral hygiene (Hillson, 1996).

Dental Wear

Tooth wear is the loss of dental enamel and is an important factor in assessing the oral health and diet of populations, as wear results, in part, from chewing foods of various consistencies and textures. Tooth wear is not, in and of itself, a pathological condition; instead, it occurs as part of a general, natural process that occurs over the course of an individual's lifetime (Molnar, 1972; Powell, 1985). As such, tooth wear is age-related and in some cases is used to estimate ages of individuals (Miles, 1963; Hillson, 1996, 2000). Wear is divided into two main components: attrition and abrasion. Attrition is the result of tooth-on-tooth contact, while abrasive materials, such as certain foods, cause abrasion (Powell, 1985; Hillson, 1996, 2000). Attrition creates smooth facets on teeth, especially on the occlusal surface or in the areas that make contact with other teeth. Abrasion from particles or grit in the mouth or food promotes microscopic pitting and grooving on enamel and can result in an overall loss of surface detail. The severity of dental wear ranges from mild, in which only the enamel is affected, to extensive, in which the pulp cavity is exposed (Powell, 1985; Hillson, 1996). Researchers characterize the most severe form as pathogenic, because pulp cavity exposure can lead to infection, periapical lesions, and/or tooth loss.

After the initial erosion of dental enamel, secondary dentin is laid down in order to protect the pulp cavity. If the entire occlusal enamel surface is lost, this dentin serves as the occlusal surface until it erodes. Once the secondary dentin is breached, the nerve pulp recedes, and the superior portion of the pulp cavity is filled with dentin, further protecting the tooth. In some cases, the entire pulp cavity may be filled, avoiding tooth loss (Molnar, 1972; Powell, 1985). Severe wear may result in loss of crown height, which can cause compensatory extra-eruption or tilting of the tooth (Larsen, 1997).

Dental wear may be indicative of both diet and food preparation techniques. Severity of wear is reliant on the abrasiveness of food particles, grit, or other materials introduced to the oral cavity, as well as the preparation of the food. Food preparation techniques that involve particularly coarse materials, such as stone grinders, can inadvertently put additional abrasive materials into the foods, increasing the resulting wear (Powell, 1985; Larsen, 1997).

Summary

Dental caries, periapical lesions, antemortem tooth loss, dental calculus, and dental wear together create a picture of oral health and diet in past populations. Variation in the prevalence of theses dental pathological conditions as well as differences in patterns of tooth wear can provide insight into dietary shifts, such as the one that accompanied the adoption of agriculture (e.g., Sciulli and Schneider, 1985; Larsen et al., 1991). These dietary shifts, in turn, can have a profound effect on the health of the population as malnutrition, disease, and parasitism have a synergistic effect (Powell, 1988). Improvements in nutrition can reduce an individual's susceptibility to pathogens, thereby reducing the rate of infections for the entire population. Conversely, if nutrition declines, there may be a corresponding increase in infections.

Skeletal Indicators of Health: Stature

Anthropologists often use adult stature as a proxy for health, as it reflects the cumulative effects of nutrition, infection, and stress experienced during skeletal growth. As such, reduced adult stature is evidence of subadult stress (Goodman et al., 1988). While heredity plays a large role in determining maximum adult stature, stress resulting from malnutrition, disease, socioeconomic status, and other factors can prevent the full height attainment (Goodman et al., 1988; Steckel, 1995). Modern studies of living populations suggest a relationship between stature and these factors. The association of growth retardation leading to reduced stature and improper nutrition or chronic disease has been demonstrated in several populations (e.g., Orr et al., 2001; Pawson et al., 2001). For example, researchers noted a marked growth reduction and skeletal development in Peruvian children coming from economically disadvantaged families in which nutrition and health conditions were poor (Pawson et al., 2001). Conversely, children of more economically advantaged families had access to improved nutrition and better health conditions, thereby leading to greater skeletal growth and development. Orr and co-workers (2001) examined two populations of Amerindians from the Amazon, inhabiting different ecological zones. The researchers found significant differences in growth of children between the two groups, which they asserted was related to differences in dietary quality and the associated nutritional quality. The population with higher consumption of animal protein had better growth than the population that consumed less animal protein (Orr et al., 2001).

Studies of historical populations also underscore this relationship (Steckel, 1986, 1987, 1994; Komlos, 1994, 1995; Padez, 2003). In a study of American Slaves, Steckel (1987) found that young children had greatly reduced growth rates, likely due to early weaning and inadequate supplementary foods that did not provide proper nutrition for skeletal growth. Additionally, slave children faced high levels of infectious disease, which would have also contributed to their slowed growth. Padez (2003) examined the heights of young Portuguese males over the course of approximately 100 years, beginning in the early 20th century. Comparisons of stature among distinct social strata revealed that stature was greatest in the highest strata, which likely reflected their more economically advantaged situations (Padez, 2003). The positive secular trend in adult stature for all strata of Portugal is suggested to have been the result of improved nutrition, better sanitation, and greater health care; however, there continues to be a discrepancy between the highest and lowest strata, albeit to a lesser degree than at the beginning of the 20th century (Padez, 2003).

The functional relationship between adult stature and nutrition, disease, stress, and other factors makes this health indicator an especially useful measurement of community health and well-being during the period of skeletal growth (Goodman et al., 1988). Although the specific origin of growth retardation and reduced adult stature may not be determined for a population, the presence of such reductions suggests a general health problem. Used in conjunction with indicators of infection, systemic stress, and diet, researchers are able to elicit a more comprehensive picture of community health in the past.

Stature was included in this study, because of the cumulative effects of systemic stress, infection, and diet on this particular variable. To assess adult stature differences, maximum length of the femur was used to represent stature. Measurements were taken according to standard osteological methods (Buikstra and Ubelaker, 1994). Mean femoral length was calculated separately for males and females.

Skeletal Indicators of Lifestyle: Activity Patterns

Degenerative joint diseases (DJD) or osteoarthritis is a chronic, age-progressive disorder that affects any joint in the body, most often the knee, hip, shoulder, and elbow (Ortner, 2003). DJD is caused by "wear and tear" on the joints, although more specific factors are implicated in its etiology, including age, gender, weight, disease, heredity, injury, and others (Bridges, 1992; Sharma, 2001). Physical activity and biomechanical stress, however, are thought to be the two main causes of DJD. As activity patterns and mechanical loads change, the pattern, severity, ad prevalence of DJD changes as well. Many studies (e.g., Bridges, 1992, 1994; Larsen et al., 1996; Miles, 2000; Cope et al., 2005) have demonstrated this relationship by observing concomitant changes in DJD and activity patterns, including changes in subsistence strategy (Bridges, 1989, 1991a, 1991b, 1994; Larsen, 1998) and changes in the sexual division of labor (Bridges 1991b, 1992; Larsen, 1998; Sofaer Derevenski, 2000). While DJD may be useful in detecting general changes in activity patterns, it does not necessarily provide evidence of specific activities or occupations (Larsen, 1997). Anthropologists categorize the progressive changes associated with DJD with respect to the joints involved and the severity of involvement. By comparing these data with data from other populations, researchers can assess whether the severity of DJD has increased or decreased for specific joints or for the population as a whole, whether the pattern of joint involvement has changed, and whether the overall prevalence of DJD has changed. This information enables anthropologists to draw conclusions about the activity patterns of the population in question.

There are three ways through which DJD affects the skeleton: destruction of articular cartilage, reactive bone formation, and new bone and cartilage deposition (Ortner, 2003). Hyaline cartilage is a flexible and strong connective tissue that lines diarthrodial or synovial joints, such as the knee, hip, and elbow (Martin et al., 1998). The cartilage works to reduce the amount of friction between bones involved in a joint, by providing a lubricated surface and preventing wear; however, hyaline cartilage is not a shock absorber, because it is so thin (Martin et al., 1998). Although the relationship between hyaline cartilage and bone in DJD is not clear, it is clear that when the cartilage is destroyed, the bony joint suffers the consequences (Larsen, 1997; Hough, 2001). In addition, there is debate as to the reason why cartilage degenerates. Some researchers suggest it is related to aging, while others assert it results from a complex set of factors (Ortner, 2003). There is one point in which most researchers agree; joint use is an important determinant in cartilage loss. The loss of cartilage causes bone-on-bone contact and abrasion, leading to pitting of the joint surface, mechanical attrition, and when the joint lacks all cartilage, a polishing of bone, known as eburnation (Figure 3.12). Eburnation is diagnostic of DJD and is evidence that the joint is still in use, as the polishing will only occur as the bones make contact with each other during joint movement (Larsen, 1997; Ortner, 2003). Additionally, reactive sclerotic bone forms in the subchondral bone of the joint (Hough, 2001; Ortner, 2003). DJD also causes new bone to be deposited at the joint margins in the form of osteophytes or osteophytic lipping (Larsen, 1997; Hough, 2001; Ortner, 2003). These osteophytes vary in size and shape from small areas of bone growth to large ridges of unevenly formed bone (Figure 3.13). This variation may be related to the degree of severity of DJD. The most severe forms of DJD can lead to ankylosis (fusion) of the joint; however, this is unusual in diarthrodial joints (Larsen, 1997). Joint fusion does occur on occasion in extreme cases of DJD of the spine, in which two or more contiguous vertebrae become connected as the osteophytes form a bridge from one vertebra to the next. Ankylosis may cause herniation of the intervertebral disks, as the space between adjacent vertebrae becomes reduced. Such a herniation may leave an impression on the vertebral bodies, referred to as Schmorl's nodes. In addition, joint fusion may create compression fractures of the vertebral bodies, resulting in a wedge-shaped deformity that is similar in appearance to that observed in tuberculosis (Larsen, 1997; Ortner, 2003).

There are two main types of DJD: primary and secondary (Sharma, 2001; Ortner, 2003). The primary form occurs in older individuals and may result as an accumulation of the effects of habitual activity, biomechanical stress, traumatic injury, and others. The

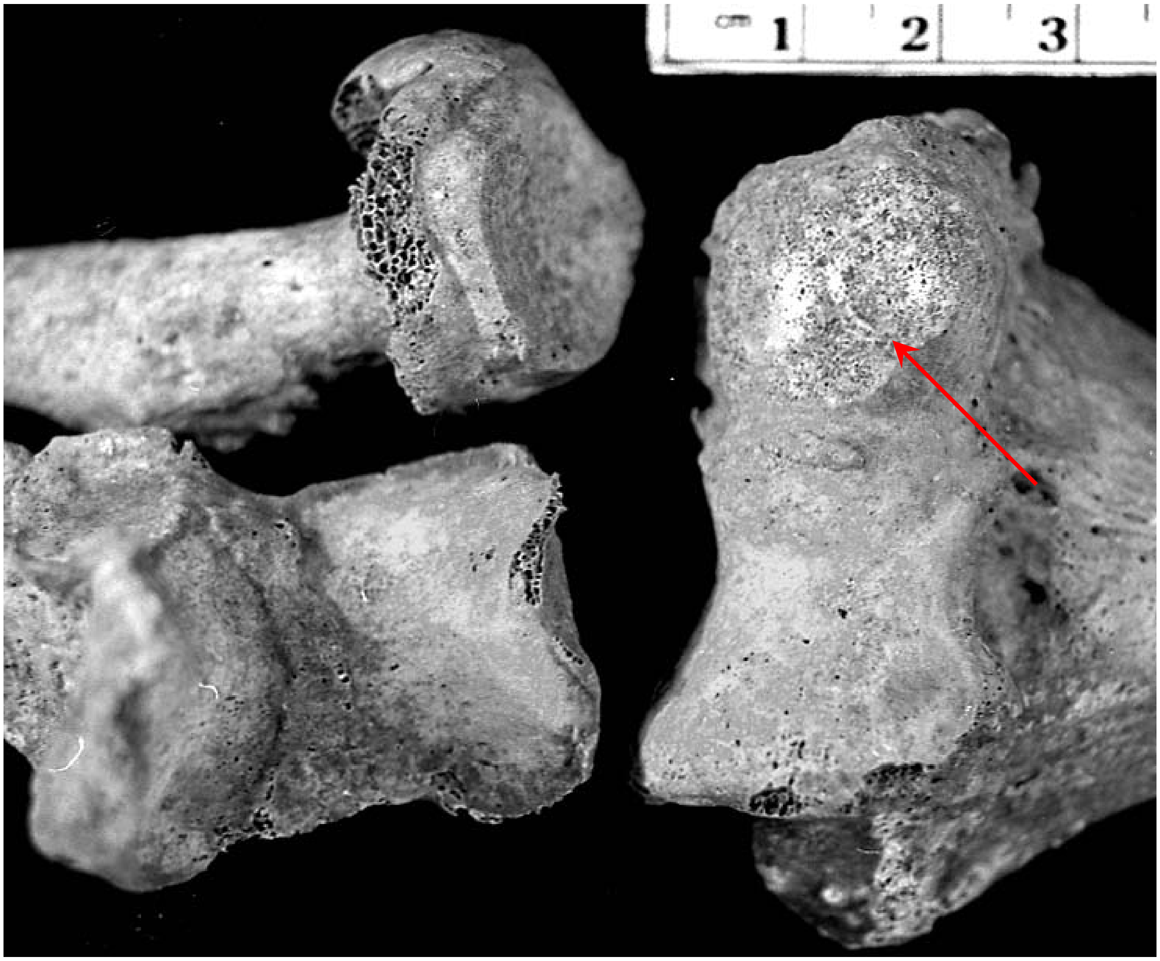

Figure 3.12. DJD of right elbow with eburnation (arrow) (Śródka burial 46)

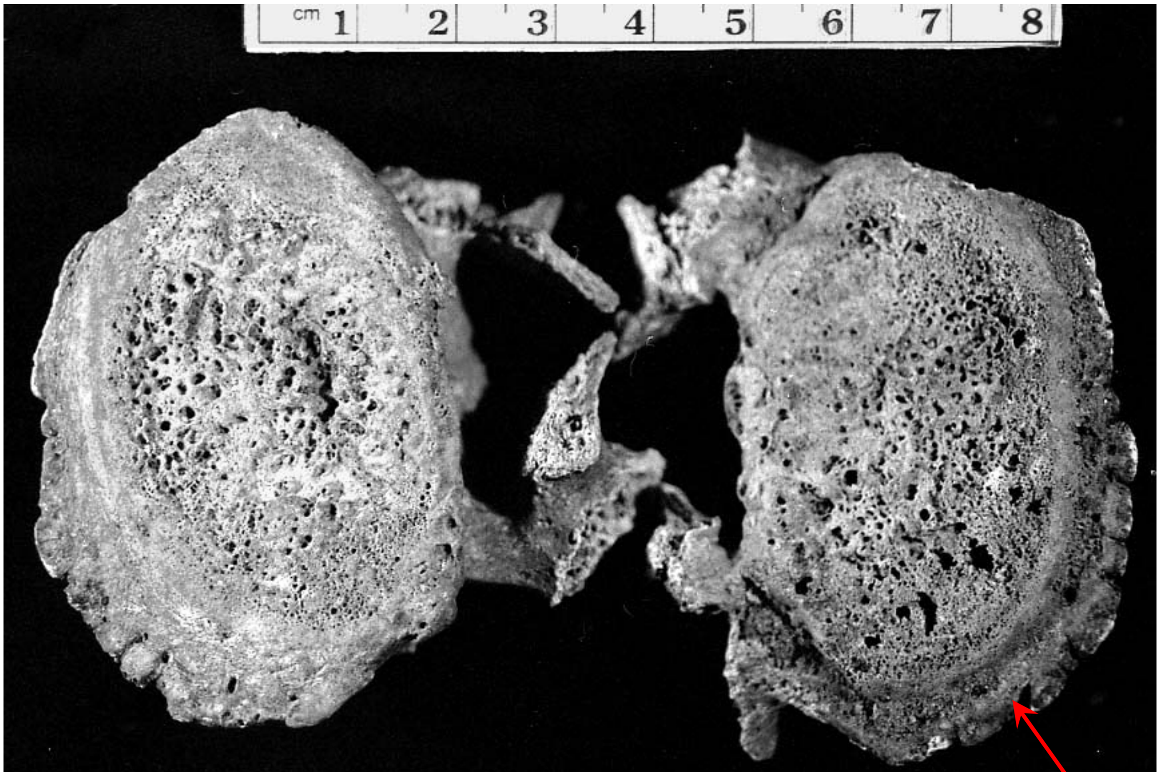

Figure 3.13. DJD of lumbar vertebrae with osteophytes (arrow) (Śródka burial 9)

secondary form, on the other hand, occurs in much younger individuals, usually in conjunction with some other disease or injury (Ortner, 2003). Either of these may affect multiple joints, although secondary osteoarthritis more commonly affects a single joint alone. Often, there is bilateral involvement of a joint, particularly in the knee and hip, and in the hip, involvement of one side increases the chance of the other hip being affected (Sharma, 2001). In the hand, multiple joints of the phalanges and carpals may be involved due to a clustering effect. If one joint in the hand is affected, the likelihood of involvement increases for other joints in the same hand (Sharma, 2001; Kalichman et al., 2004).

Degenerative joint disease was included in this study, because it is an important indicator of past activity patterns and lifestyles. Every population is affected by DJD (Larsen, 1997) and, therefore, interpretations about biomechanical stress and activity can potentially be made for any population. Like infectious disease, DJD is a more severe expression of the disorder and does not represent all the cases in a population. At its earliest, DJD affects only soft tissues, leaving no skeletal evidence; therefore, the prevalence of DJD is a minimum, since individuals may have died (from other unrelated causes) before DJD of the skeleton developed (Ortner, 2003). Reconstructing activity for past populations from the pattern, prevalence, and severity of DJD is an important aspect of health and lifestyle assessments, as this data provides information about the biomechanical stress experienced in a population.

Degenerative joint disease was scored for all major joints of the body, including shoulder, elbow, wrist, hip, knee, ankle, and vertebrae. Right and left elements were scored independently. The scoring of DJD required the presence of one of the two or three surfaces involved in the joint. If both joint surfaces were present, the more severe form was recorded. The complete scoring system is located in Appendix A.

Skeletal Indicator of Lifestyle: Trauma

Assessments of traumatic injury are important in reconstructing past behaviors and lifeways. Trauma can result from intentional or accidental actions leading to various injuries; however, many of these injuries may not affect skeletal tissue and therefore leave no evidence on skeletal remains. Regardless of this limitation, the presence of traumatic injuries is useful in investigations of accidents and interpersonal violence in past populations (Larsen, 1997; Lovell, 1997). Evidence of traumatic injuries can take many forms: unhealed fractures, partially or fully healed fractures, bone remodeling from dislocated joints, and ossification of muscles, tendons, or other soft tissues (Walker, 2001; Figure 3.14). One of the most confounding factors in trauma analysis is the determination of modern damage and taphonomic alternations from original traumatic injury. This is especially problematic with perimortem injuries that occur at the time of death; it is virtually impossible to discriminate between injuries that happened just before death from injuries that happened just after death (Larsen, 1997; Walker, 2001). As a result, perimortem injuries are often considered separately from those that clearly occurred antemortem, since the interpretation of perimortem injuries is more tenuous. Antemortem injuries are much easier to identify as signs of healing, such as a callus of new bone or infection and inflammation of the surrounding bone are unmistakable evidence of traumatic injuries sustained during life (Walker, 2001).

Trauma analysis is especially useful in assessing past social, cultural, and environmental conditions of a particular population. Accidental injuries provide insight

Figure 3.14. Healed fracture at midshaft of right radius and ulna (Śródka burial 54)

into environmental and occupational hazards encountered, while intentional injuries offer information about interpersonal violence, including intra- and inter-group conflict (Lovell, 1997). Accidental injuries reflect the overall lifestyle of the population in question. A skeletal sample with a high prevalence of accidental injuries may indicate that the general lifestyle of that society was more dangerous or hazardous than a group presenting few accidental injuries. Skeletal indicators of interpersonal conflict may be supported by additional archaeological evidence, such as fortifications or other defensive structures, weapons, and site location. However, only traumatic injuries provide direct evidence of interpersonal violence (Larsen, 1997; Walker, 2001). Trauma analysis for populations as a whole are essential for determining the demographic or social groups involved, the scale of conflict, and the level of violence.

Investigations of fractures, dislocations, weapon wounds, and other injuries must include assessments of injury location, number of skeletal elements involved, associated complications, and degree of healing if determinations of the nature of the injury are to be made (Lovell, 1997). To distinguish between accidental and intentional injury, the pattern and prevalence of traumatic lesions in the individual and in the population must be analyzed in addition to the social, cultural, and environmental contexts (Lovell, 1997).

Analysis of trauma was included in this study, because investigations of traumatic injuries are vital to assessments of the behavior, lifestyles, and health of past populations. Interpretation of individual traumatic injuries is difficult and, in some cases, contentious, underscoring the importance of a population-level perspective. By examining the pattern and prevalence of traumatic injuries for both the individual and the population, the ultimate cause (i.e., accidental or intentional) of injuries may be discerned, providing insight into the cultural, social, and environmental contexts of that population. In this study, traumatic injuries were recorded by location, type of injury, number of elements involved, associated complications, and degree of healing. The complete scoring parameters for traumatic injuries are in Appendix A.

Statistical Analysis

Analysis of the data focused on assessing whether there were significant temporal changes in the prevalence and severity of each skeletal marker. Chi-square tests of significance ($p \leq 0.05$) were used to determine whether the hypotheses presented in Chapter 2 should be accepted or rejected. When sample sizes were below five, Fisher's Exact Test was used in place of chi-square (Fleiss, 1981). To determine whether the three temporal samples have a similar demographic structure, and are thus comparable, a Kolmogorov-Smirnov test was conducted.

The data analysis involved comparisons of the prevalence of each skeletal indicator among the three temporal samples. Additional analyses compared the severity of pathological conditions among the three samples. It was important to take severity into consideration, because it may reflect a different type of change that has occurred in the population. In other words, while the prevalence may have not changed, the severity may have. For example, if the pre-urbanization and the early urbanization samples both have a prevalence rate of 50% for cribra orbitalia, it may appear that this stress indicator is static over time. However, if the severity increased from the pre-urbanization sample to the early urbanization sample, it would indicate that systemic stress had, in fact, worsened over time. Comparisons of sex-based differences in the prevalence and severity of each skeletal indicator within each of the three temporal samples were conducted. Sex-based differences needed to be taken into consideration, because they can reflect social changes that have occurred in a population. If the difference in the prevalence of a stress indicator between males and females increases over time, it indicates that the types or levels of stress that males and females are experiencing is changing. For example, one sex may be more stressed over time, while the other is less stressed due to changes in diet for males and females. This type of change may be masked in other types of analyses, so it is important to examine sex-based differences separately. Likewise, comparisons of age-based differences in the prevalence and severity of skeletal markers were carried out to further ascertain any social changes that occurred in the population. This type of comparison may be useful in detecting a change in stress levels between adults and subadults. Temporal comparisons of prevalence, severity, and sex-based differences were carried out for most, but not all skeletal indicators. The following describes which statistical analyses were conducted for each determinant of health and lifestyle.

Skeletal Indicators of Health: Systemic Stress

Comparisons of the prevalence of porotic hyperostosis, cribra orbitalia, and enamel hypoplasias were conducted among the three temporal samples. In addition, the severity of each condition was temporally compared. These comparisons were carried out for adults, adult males, adult females, and subadults. Temporal comparisons of sex-based and age-based differences in the prevalence and severity of each stress marker were conducted as well. Temporal comparisons of systemic stress indicators were used to test hypothesis one, which suggests that health declined temporally due to urbanization.

Skeletal Indicators of Health: Infection

Temporal comparisons of the prevalence of periostitis, leprosy, treponematosis, and tuberculosis were conducted. Severity of periostitis was also compared among the three temporal samples for each element. The three infectious diseases were not analyzed in terms of severity. Comparisons were conducted for adults, adult males, adult females, and subadults. Additionally, sex-based and age-based differences in prevalence and severity were carried out in each of the three temporal samples. These temporal comparisons of infection were used to test hypothesis one that there was a decline in health over time in conjunction with urbanization.

Skeletal Indicators of Health: Diet

Comparisons of the prevalence and severity of dental caries, periapical lesions, antemortem tooth loss, and dental calculus were conducted among the three temporal samples. Severity was determined by the number of affected teeth per individual. Additionally, temporal comparisons of dental caries were carried out by tooth class (i.e., incisor, canine, premolar, and molar), by tooth surface (i.e., buccal, lingual, cervical, occlusal, mesial, and distal), and by size of carious lesion. For each dental condition, comparisons were conducted for adults, adult males, adult females, and subadults. Sex-based and age-based differences in each pathological condition were also compared within the three temporal samples. Comparisons of the severity of dental wear were also carried out among the three samples. Dental wear was analyzed for adults, adult males, adult females, and subadults; sex-based differences in dental wear severity were also examined. Furthermore, dental wear severity was analyzed by age cohorts (i.e., young adult, middle adult, and old adult), separately assessing males and females within each age group. Comparisons of dental indicators were used to test hypothesis three, suggesting that diet remained constant over time.

Skeletal Indicators of Health: Stature

Mean maximum femur lengths were calculated for adult males and adult females within each temporal sample. Comparisons of mean male and female femoral lengths were then carried out among the three samples. A Monte Carlo test was conducted to determine whether the mean femoral lengths differed temporally. Temporal comparisons of stature were carried out to further test hypothesis one, which asserts that health and, thereby, adult stature (femoral length) declined temporally due to urbanization.

Skeletal Indicators of Lifestyle: Activity Patterns

Temporal comparisons of the prevalence and severity of DJD was conducted for each major joint of the body, including the limb joints, the temporomandibular joint, and the vertebrae. Right and left elements were considered separately. These analyses were carried out for adults, adult males, and adult females. Subadults were not included, as they DJD is an age-related phenomenon. Sex-based differences in the prevalence and severity were also temporally compared. In addition, DJD severity was also temporally compared by age cohorts (i.e., young adult, middle adult, and old adult), with separate analyses for males and females within each cohort. To determine whether the overall pattern of DJD (i.e., the specific joints affected by DJD) for the population as a whole had changed over time, correspondence analysis was conducted for adults, adult females, and adult males. The prevalence rates of DJD for specific joints were compared among the three temporal samples in order to determine whether the overall pattern differed among the samples. Temporal comparisons of DJD were used to test hypothesis two, suggesting that the prevalence, severity, and pattern of DJD changed temporally, as a result of urbanization.

Skeletal Indicators of Lifestyle: Trauma

Comparisons of the prevalence of traumatic injuries were conducted among the three temporal samples. These comparisons were carried out for adults, adult males, adult females, and subadults. In addition, sex-based and age-based differences in trauma prevalence were also analyzed within the three samples. The pattern and prevalence of the traumatic lesions were analyzed in each instance to determine the nature and/or cause of the injuries, if possible. Temporal comparisons of traumatic injuries were used to test hypothesis four, which asserts that interpersonal violence increased over time due to urbanization.

Summary

The three skeletal samples from medieval cemeteries in Poznań, Poland were chosen for this study, because they represent individuals who lived and died during the three temporal periods of interest: pre-urbanization, early urbanization, and late urbanization. These samples include males and females of all ages and are representative of the majority of the population that would have been involved in a variety of crafts and trades (Pawłak, 2005b). Variation in aspects of their burial among the three cemeteries, including grave orientation, wooden and stone constructions or coffins, and grave goods reflect religious and social changes that were occurring in the population, as the newly adopted Christian traditions were originally melded with the traditional religious practices, but later replaced them (Pawłak, 1998). The comparability of the three cemetery samples in terms of time and space enabled them to be collapsed into a single sample, which was then divided according to the three temporal periods of urbanization.

Data collection was carried out using the scoring protocols of the Global History of Health project, which developed standardized software for coding a large range of skeletal indicators of health and lifestyle. All skeletal indicators utilized in this study are included in the software. Age estimations and sex determinations followed standard anthropological procedures. Based on the results of these, individuals were grouped by sex (male, female, undetermined) and age (fetal, birth-4 years, 5-9 years, 10-14 years, 15-19 years, 20-35 years, 35-50 years, 50+ years, undetermined child, undetermined adult, undetermined). The age and sex cohorts were then used in the statistical analyses.

The skeletal markers that were utilized in this study were chosen, because they provide a wide range of information pertaining to the health and lifestyle of past populations. Skeletal indicators of health reflect systemic stress (porotic hyperostosis, cribra orbitalia, enamel hypoplasias), infection (periostitis, leprosy, treponematosis, tuberculosis), diet (dental caries, periapical lesions, antemortem tooth loss, dental calculus, dental wear), and stature. Indicators of lifestyle include activity patterns (DJD) and trauma. Together, these indicators offer a comprehensive picture of health and lifestyle in medieval Poland and the ways in which they changed over time.

Statistical analyses of the data involved temporal comparisons of the prevalence and severity of the skeletal markers to determine whether there were significant changes. Assessments of severity of skeletal indicators are as important as analysis of prevalence, because severity may change over time even if the prevalence rate does not. In addition, sex-based differences were analyzed among the three temporal groups in order to assess whether these differences were temporally consistent. If male-female differences in indicators of health and lifestyle increase or decrease over time, it likely reflects social changes in the population. Collectively, these analyses were used to accept or reject the hypotheses of this dissertation and to draw conclusions regarding the health and lifestyle of this population.

CHAPTER 4

RESULTS

The results of the statistical analyses reveal some significant trends among the three temporal samples. However, before these trends can be discussed, it is important to examine the demography of the sample, because the age structure can affect the interpretation of the results and the understanding of health and lifestyle in a past population. An older skeletal sample may be expected to exhibit a greater number of age-related conditions, such as DJD and dental wear than a younger skeletal sample. As a result, it is essential that the demography be considered for each of the temporal samples examined here so that any differences in age structure do not confound the results. The estimations of sex and age reveal that both sexes and a full range of ages are represented by the skeletal sample. Kolmogorov-Smirnov tests of the age distributions among the three temporal samples indicate that they are not significantly different ($p \leq 0.05$). Likewise, the sex distributions of the three samples are also similar (chi-square, $p \leq 0.05$). Tables 4.1 and 4.2 and Figures 4.1 and 4.2 show the age distribution and sex distribution for each temporal sample, respectively. Examination of the demography for each sample and for the combined sample reveals that there are a large number of subadults under the age of 10 years, and few subadults between the ages of 10 and 19 years (Figures 4.3 - 4.6, Tables 4.3-4.6), a common feature of archaeological samples (Larsen, 1997). The rarity

Skeletal Sample	Pre-Urbanization Skeletons A.D. 950-1025	Early Urbanization Skeletons A.D. 1025-1100	Late Urbanization Skeletons A.D. 1100-1250
Birth – 5 years	5	14	6
5 – 10 years	8	6	3
10 – 15 years	0	2	3
15 – 20 years	0	2	1
Child – Indeterminate Age	0	3	2
20 – 35 years	2	7	6
35 – 50 years	6	11	6
50 + years	4	1	0
Adult – Indeterminate Age	18	18	16
Indeterminate Age	4	3	7
Total	47	67	50

Table 4.1. Age distribution of skeletal sample

Skeletal Sample	Pre-Urbanization Skeletons A.D. 950-1025	Early Urbanization Skeletons A.D. 1025-1100	Late Urbanization Skeletons A.D. 1100-1250
Male	11	9	7
Female	10	14	13
Indeterminate	26	44	30
Total	47	67	50

Table 4.2. Sex distribution of skeletal sample

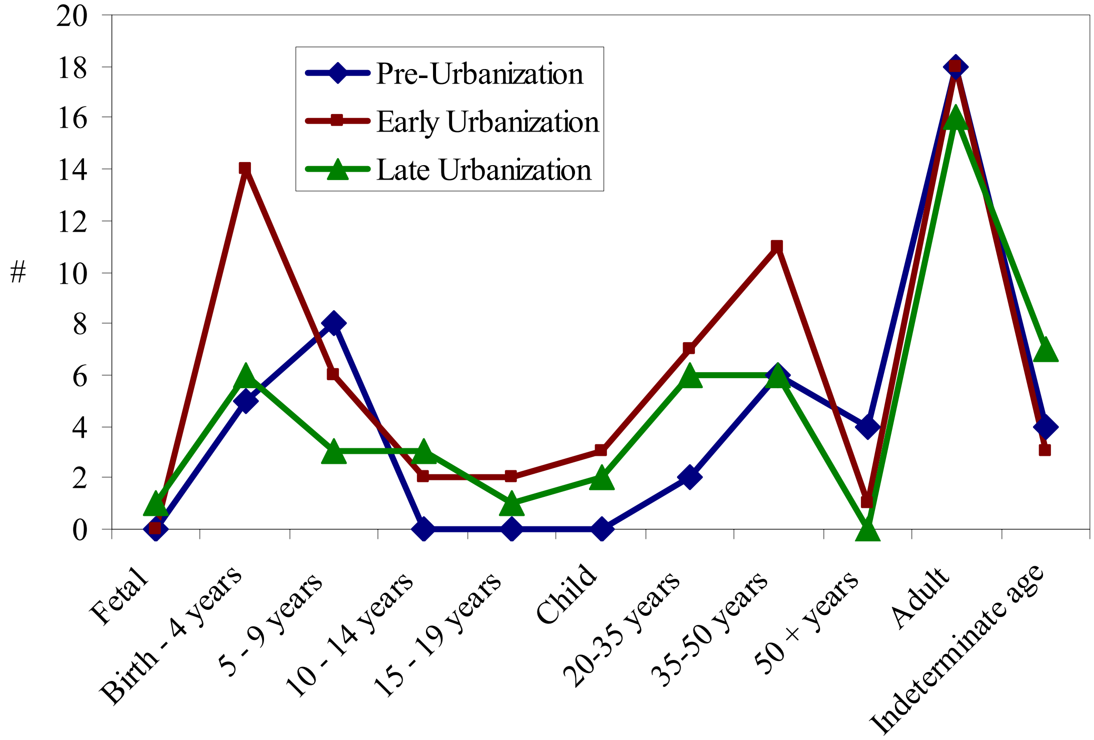

Figure 4.1. Age distribution of skeletal sample

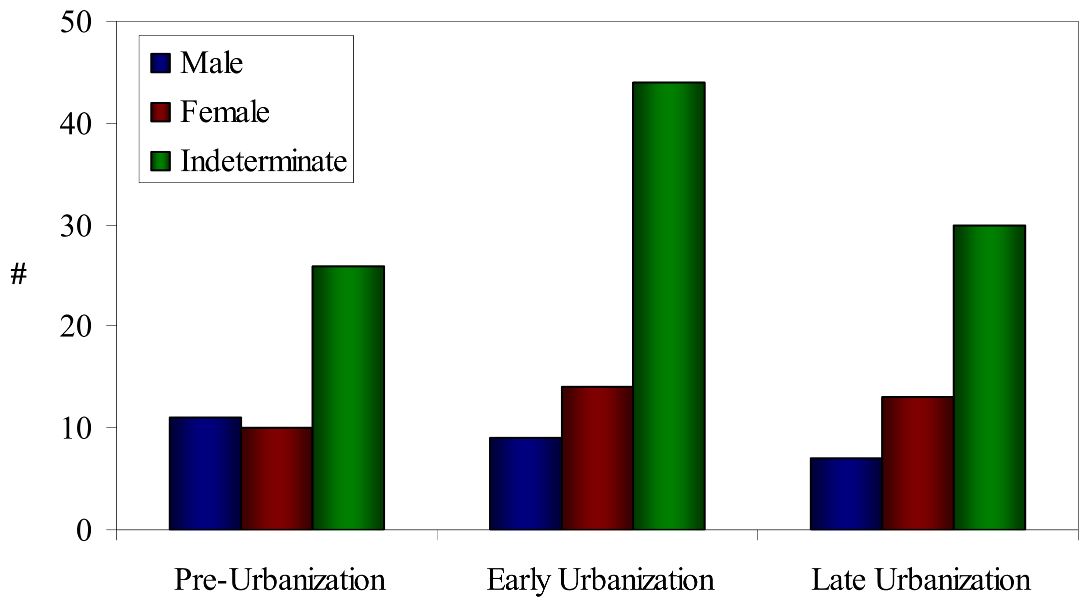

Figure 4.2. Sex distribution of adults in skeletal sample

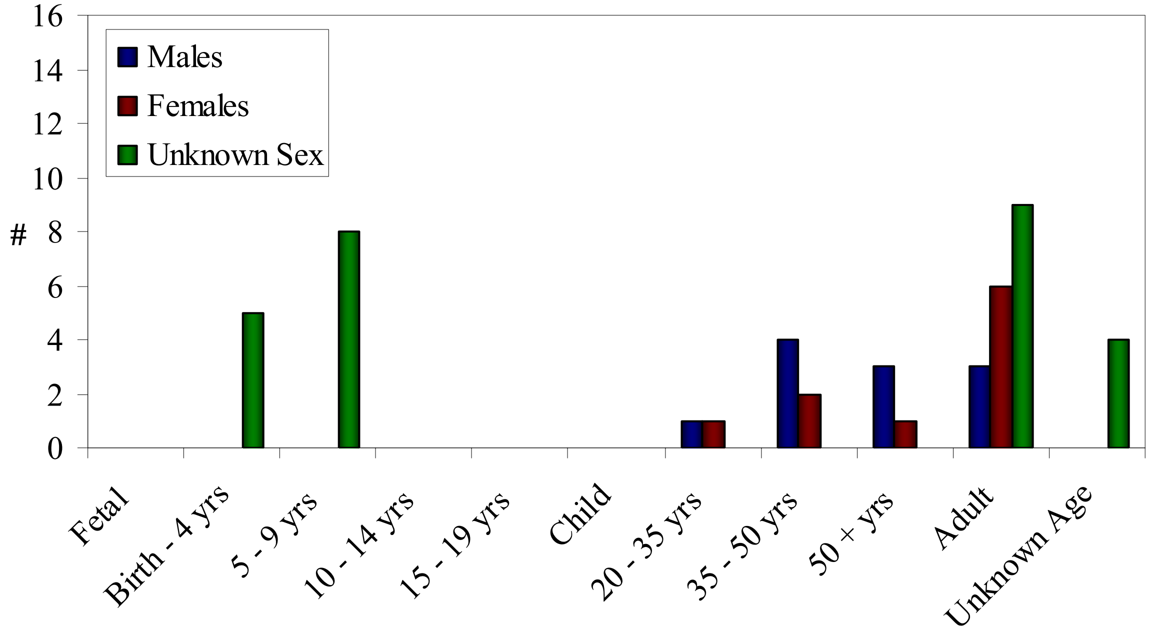

Figure 4.3. Demography of pre-urbanization sample

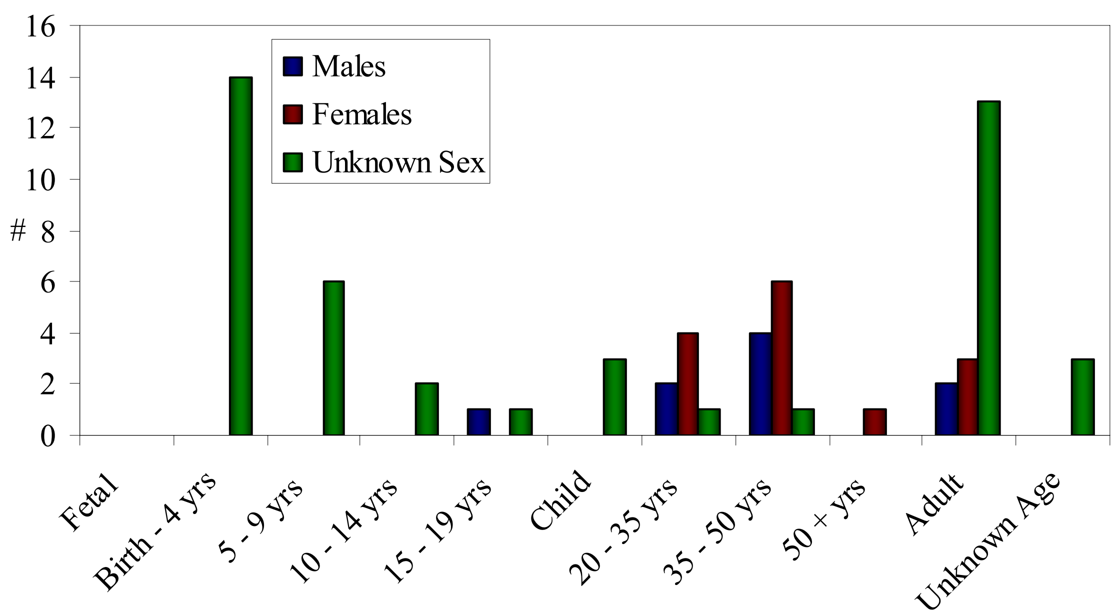

Figure 4.4. Demography of early urbanization sample

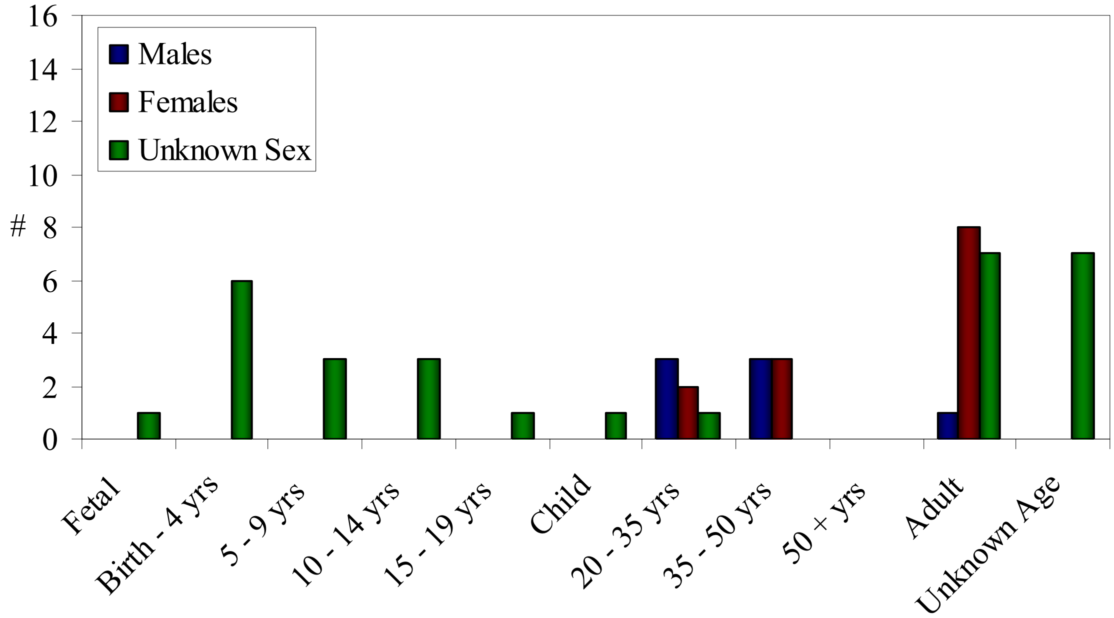

Figure 4.5. Demography of late urbanization sample

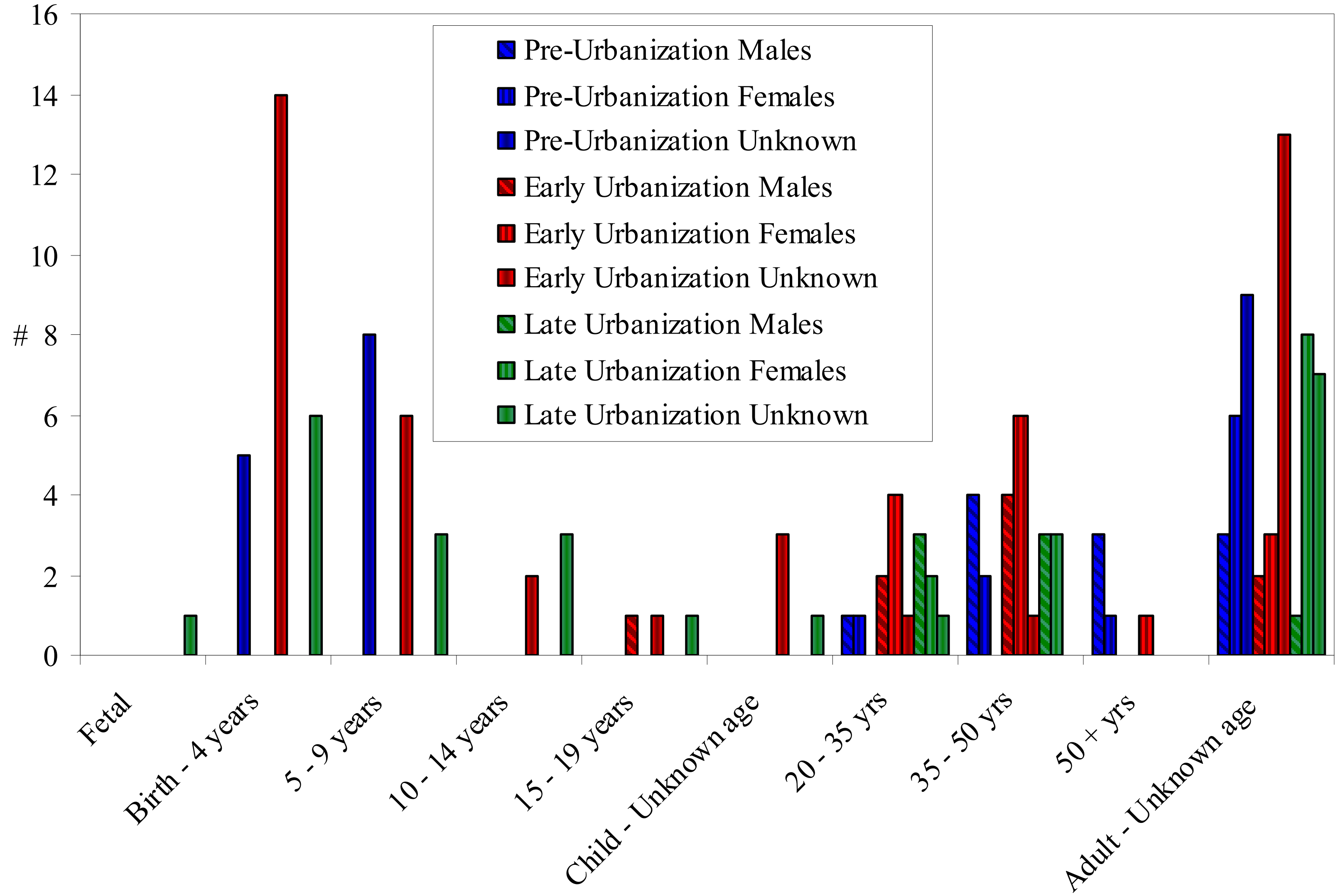

Figure 4.6. Demography of entire sample

Age Cohort	Males	Females	Unknown Sex	Total
Fetal	0	0	0	0
Birth-4 years	0	0	5	5
5-9 years	0	0	8	8
10-14 years	0	0	0	0
15-19 years	0	0	0	0
Child, unknown age	0	0	0	0
20-35 years	1	1	0	2
35-50 years	4	2	0	6
50+ years	3	1	0	4
Adult, unknown age	3	6	9	18
Unknown age	0	0	4	4
Total	11	10	26	47

Table 4.3. Demography of pre-urbanization sample

Age Cohort	Males	Females	Unknown Sex	Total
Fetal	0	0	0	0
Birth-4 years	0	0	14	14
5-9 years	0	0	6	6
10-14 years	0	0	2	2
15-19 years	1	0	2	3
Child, unknown age	0	0	3	3
20-35 years	2	4	1	7
35-50 years	4	2	0	6
50+ years	0	1	0	1
Adult, unknown age	2	3	13	18
Unknown age	0	0	3	3
Total	9	10	44	63

Table 4.4. Demography of early urbanization sample

Age Cohort	Males	Females	Unknown Sex	Total
Fetal	0	0	1	1
Birth-4 years	0	0	6	6
5-9 years	0	0	3	3
10-14 years	0	0	3	3
15-19 years	0	0	1	1
Child, unknown age	0	0	1	1
20-35 years	3	2	1	6
35-50 years	3	3	0	6
50+ years	0	0	0	0
Adult, unknown age	1	8	7	16
Unknown age	0	0	7	7
Total	7	13	30	50

Table 4.5. Demography of late urbanization sample

Age Cohort	Pre-Urbanization Males	Pre-Urbanization Females	Pre-Urbanization Unk	Early Urbanization Males	Early Urbanization Females	Early Urbanization Unk	Late Urbanization Males	Late Urbanization Females	Late Urbanization Unk	Total
Fetal	0	0	0	0	0	0	0	0	1	1
Birth-4 years	0	0	5	0	0	14	0	0	6	25
5-9 years	0	0	8	0	0	6	0	0	3	17
10-14 years	0	0	0	0	0	2	0	0	3	5
15-19 years	0	0	0	1	0	1	0	0	1	3
Child, unknown age	0	0	0	0	0	3	0	0	1	4
20-35 years	1	1	0	2	4	1	3	2	1	15
35-50 years	4	2	0	4	6	1	3	3	0	23
50+ years	3	1	0	0	1	0	0	0	0	5
Adult, unknown age	3	6	9	2	3	13	1	8	7	52
Unknown age	0	0	4	0	0	3	0	0	7	14
Total	11	10	26	9	14	44	7	13	30	164

Table 4.6. Demography of combined sample

of fetal remains may be due to their small and fragile nature; they may have deteriorated or have been overlooked during excavation (Lewis, 2007). The majority of adults for which age could be estimated fall into the middle adult category (35-50 years). Few adults of the old adult category (50 + years) are present in any temporal sample, likely reflecting a shorter lifespan of individuals during the Medieval Period. Males and females are present in both the young adult and middle adult categories; however, the old adult category only has both sexes represented in the pre-urbanization sample. The early urbanization sample has only females, and there are no old adult remains in the late urbanization sample. Overall, the demography of the three temporal samples are similar in structure.

Since the age and sex distributions of the samples are not significantly different, comparisons among the three temporal samples are reasonable in this study. In order to investigate the major trends revealed by the statistical analyses, the results are described in terms of systemic stress, infection, diet, stature, activity patterns, and trauma. For each of these, the various comparisons conducted for the presence and absence of each skeletal marker as well as for the severity of each are discussed.

Skeletal Indicators of Health: Systemic Stress

Cribra Orbitalia

Temporal comparisons of the prevalence and severity of cribra orbitalia among the three periods reveal few significant trends for the age and sex cohorts (chi-square, Fisher's Exact, $p \leq 0.05$). Comparisons of the prevalence of cribra orbitalia are generally consistent among the three temporal samples. Among adults, adult females, and adult males, cribra orbitalia remains relatively low over time (Figures 4.7-4.9, Tables B.1-B.3). Subadults also have no temporal change in the prevalence of cribra orbitalia (Figure 4.10, Table B.4). Sex-based comparisons reveal that there are no significant differences between males and females for any of the temporal samples (Figure 4.11, Table B.5). Comparisons of adults and subadults, however, reveal a significant trend for cribra orbitalia. Subadults have a significantly higher prevalence of cribra orbitalia than adults in the early urbanization sample (Fisher's exact, $p \leq 0.05$; Figure 4.12, Table B.6). Although the difference between adults and subadults is not significant in the late urbanization sample, the overall trend is that subadults, over time, have a greater prevalence of cribra orbitalia than adults.

Temporal comparisons of the severity of cribra orbitalia among adults show that there is no significant change (Figure 4.13, Table B.7). In the pre-urbanization and late urbanization samples, all cases of cribra orbitalia are mild, while in the early urbanization sample, all cases are severe. Among adult females, the severity of cribra orbitalia also does not differ among the three temporal samples (Figure 4.14, Table B.8). Like the combined adult sample, only the mild form of cribra orbitalia is found in the pre-urbanization and late urbanization samples, while only the severe form is found in the early urbanization sample. Overall, few adult males have cribra orbitalia; however, those that do are from the early urbanization sample and all cases of the stress marker are the severe form (Table B.9). Among the three temporal samples, there is no significant difference in the prevalence of cribra orbitalia for subadults (Figure 4.15, Table B.10). All samples have the mild form, while only the early urbanization sample has the severe form. Sex-based comparisons of the prevalence of cribra orbitalia reveal no significant

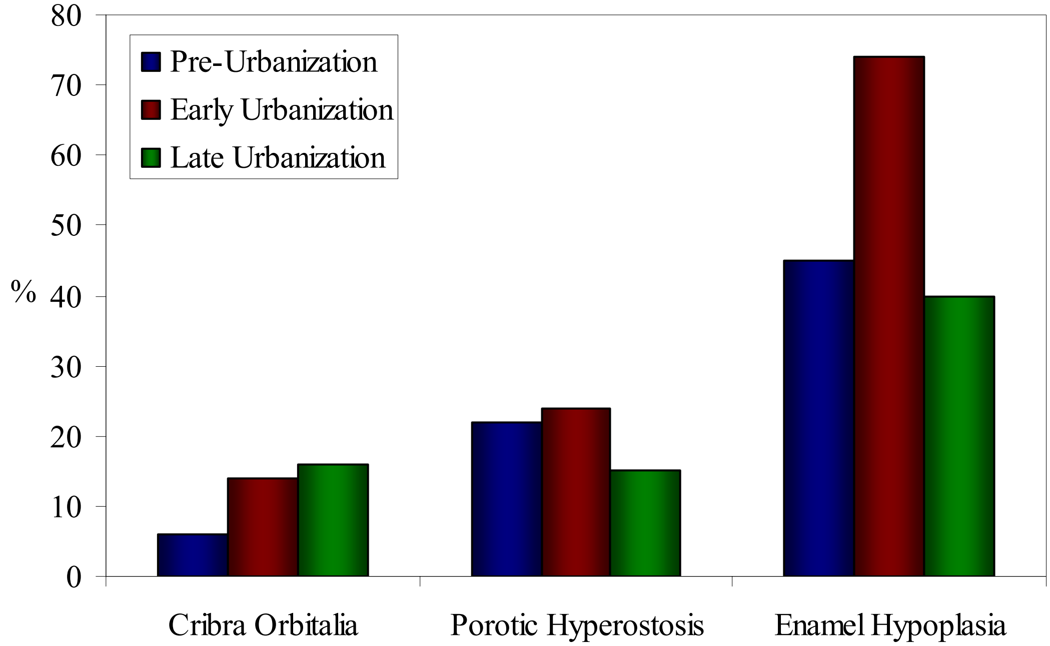

Figure 4.7. Percentages of adults with systemic stress indicators

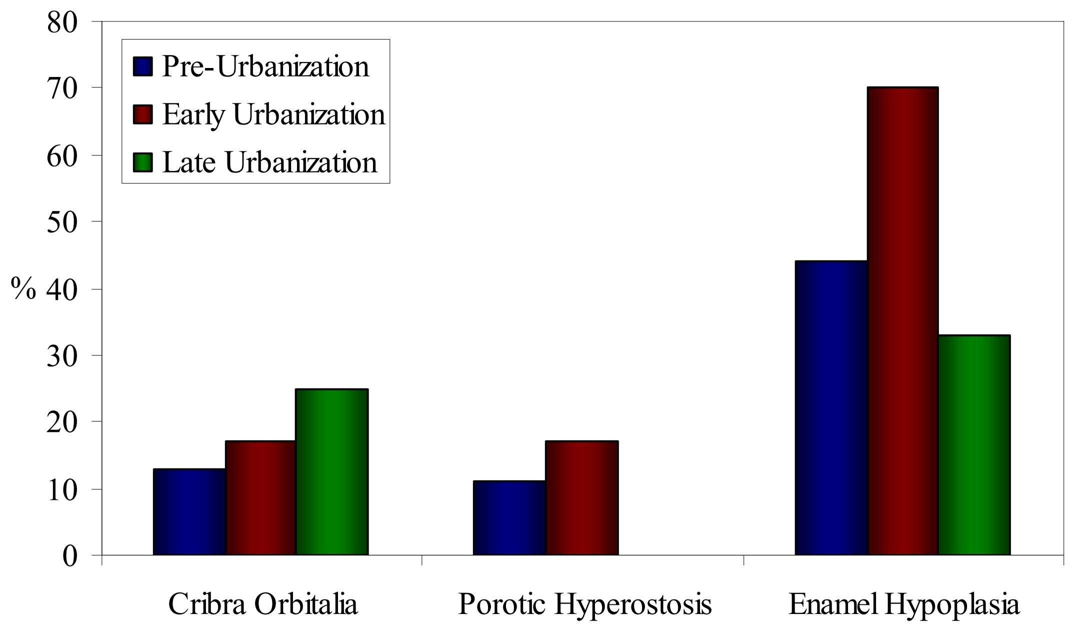

Figure 4.8. Percentages of adult females with systemic stress indicators

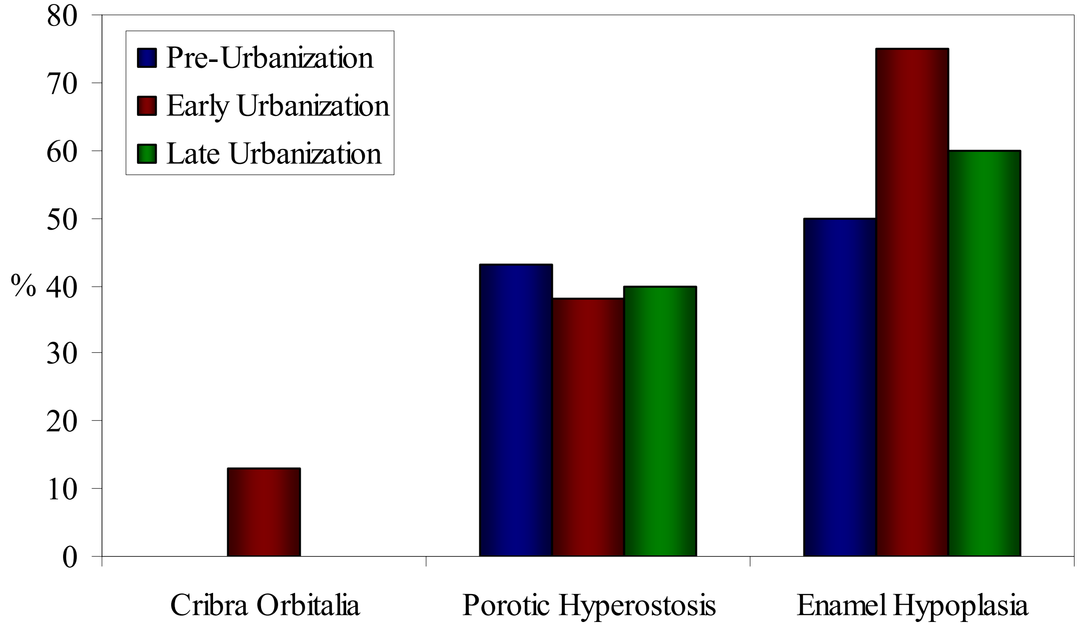

Figure 4.9. Percentages of adult males with systemic stress indicators

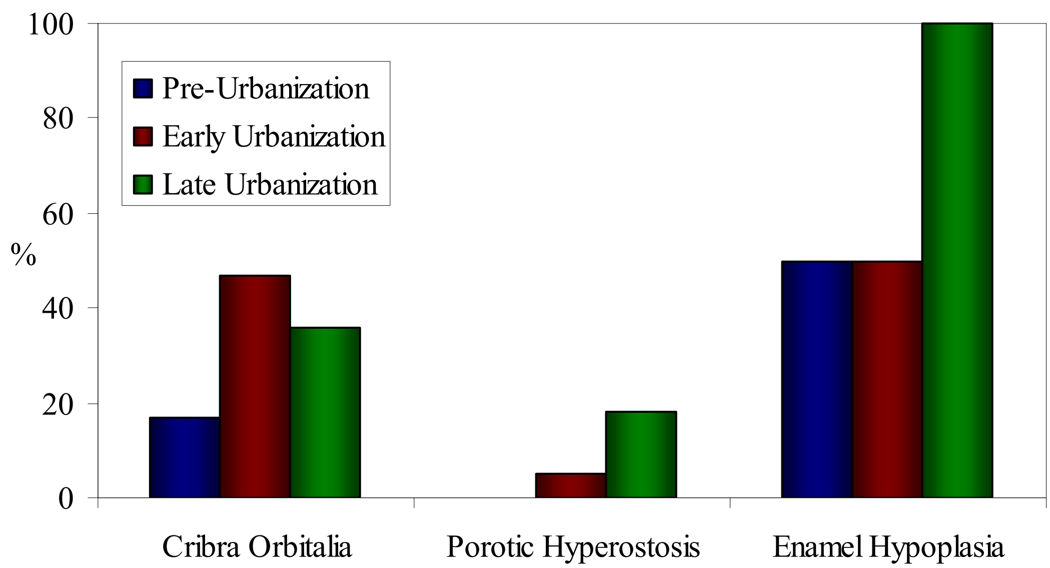

Figure 4.10. Percentages of subadults with systemic stress indicators

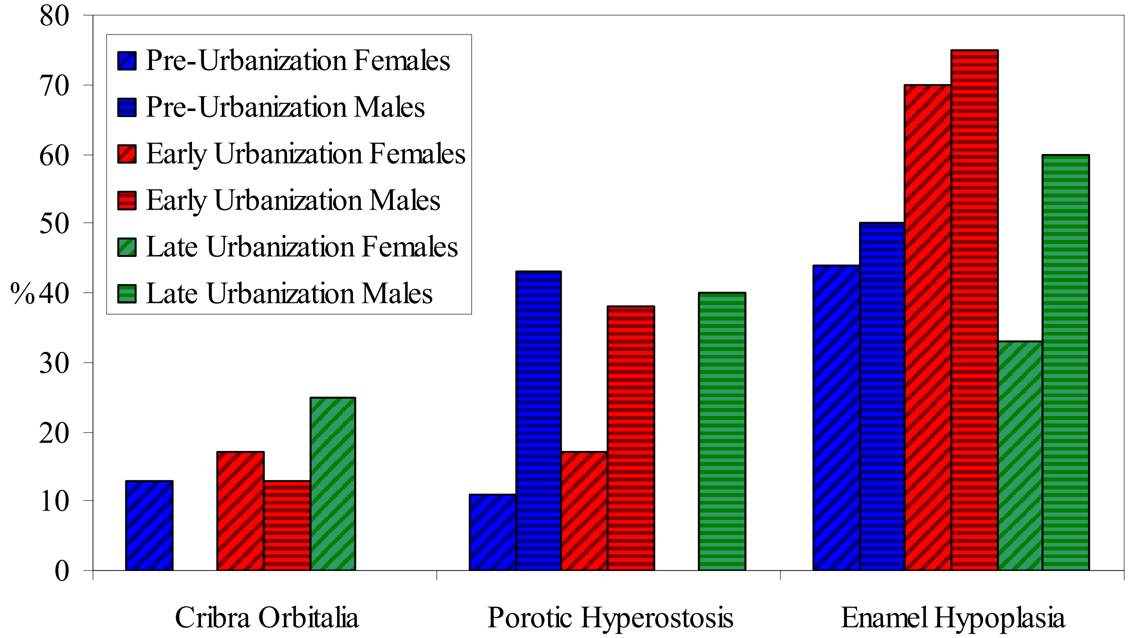

Figure 4.11. Sex-based comparison of percentages of adult males and females with systemic stress indicators

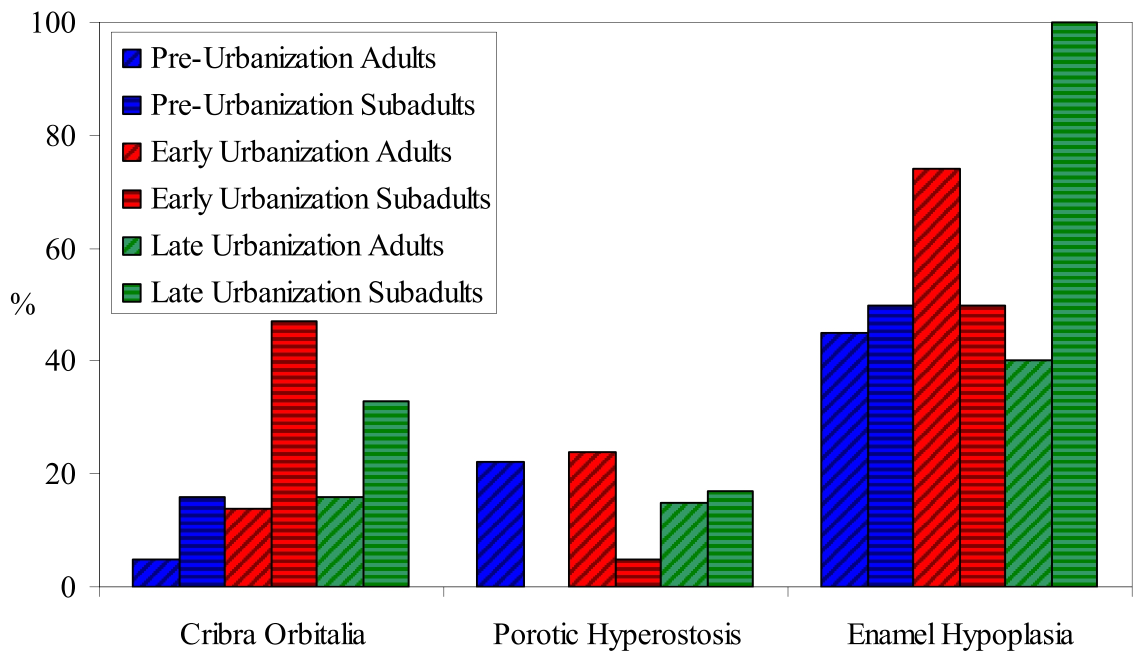

Figure 4.12. Age-based comparison of percentages of adults and subadults with systemic stress indicators

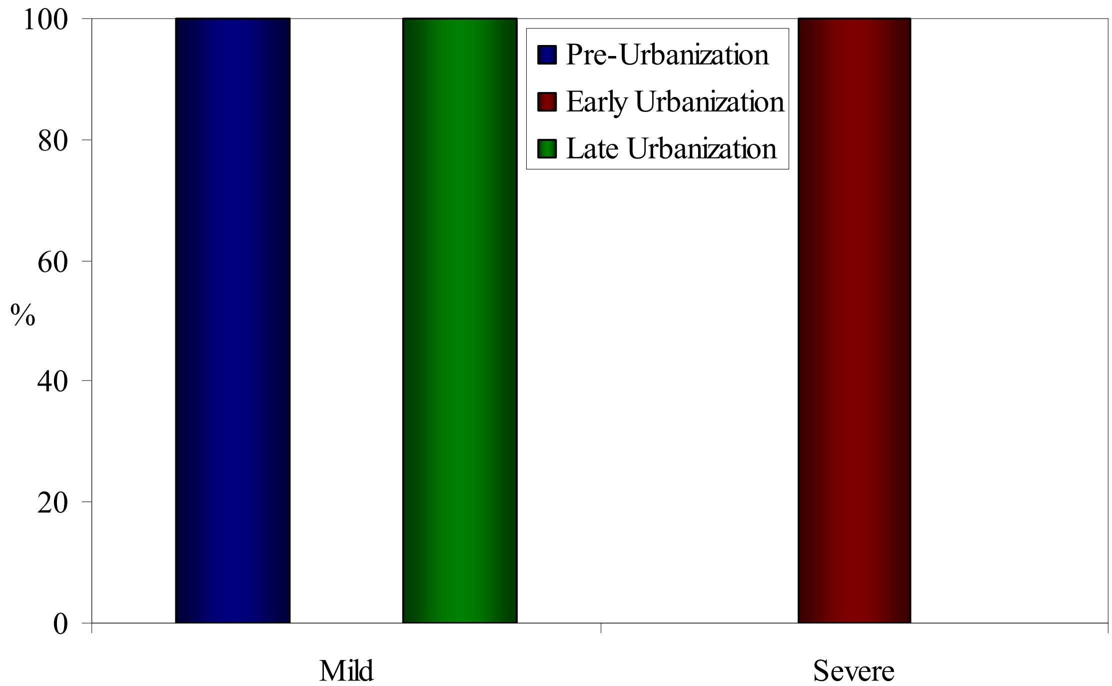

Figure 4.13. Percentages of adults with cribra orbitalia that have mild and severe forms

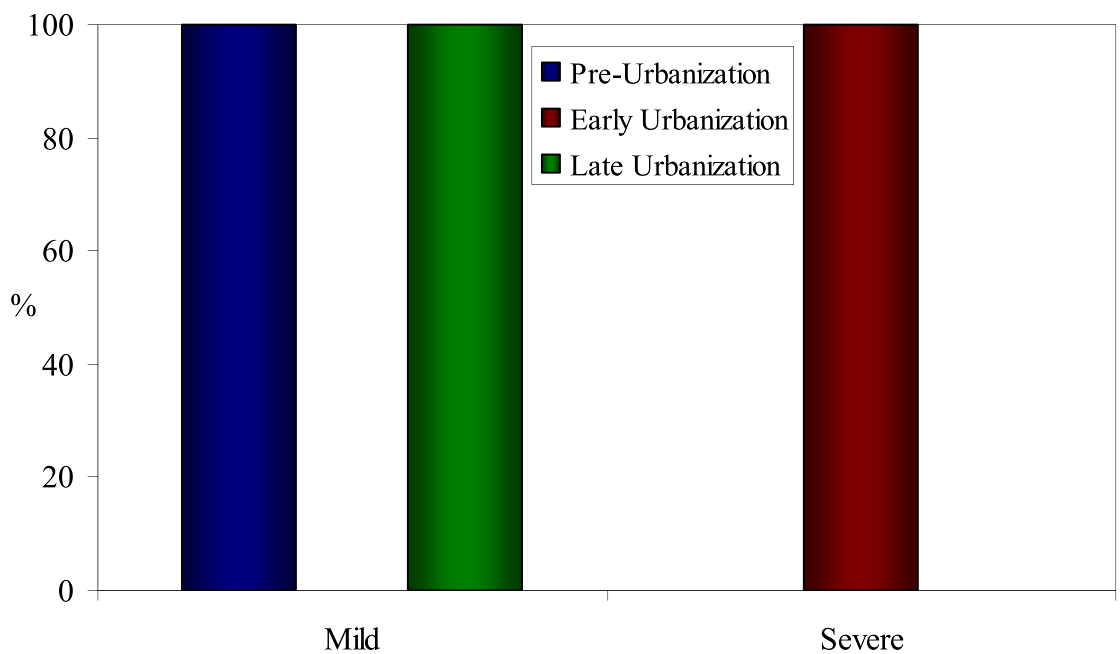

Figure 4.14. Percentages of adult females with cribra orbitalia that have mild and severe forms

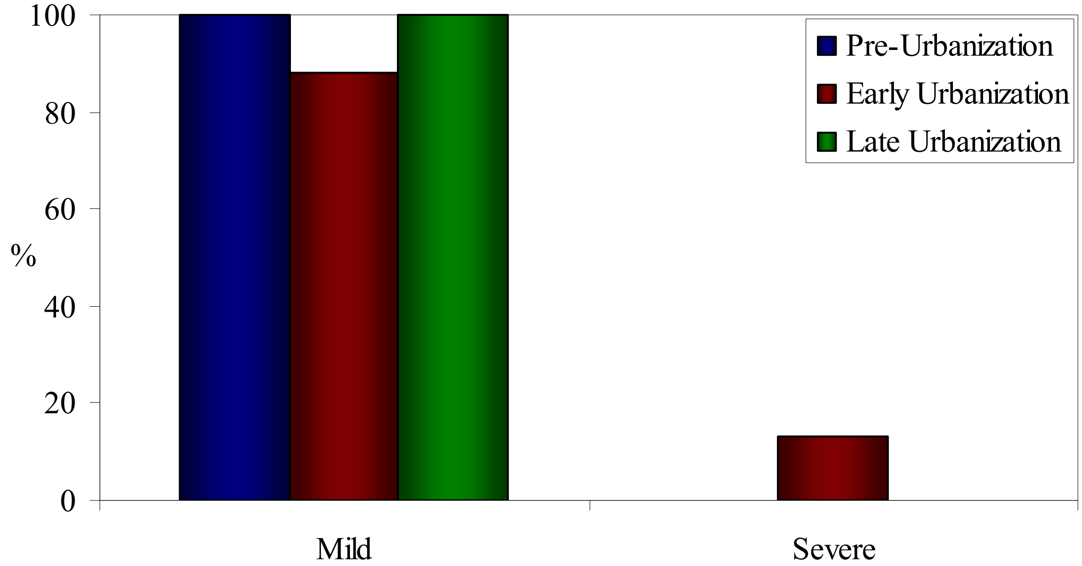

Figure 4.15 Percentages of subadults with cribra orbitalia that have mild and severe forms

difference between males and females for any time period (Figure 4.16, Table B.11). Comparisons of adults and subadults, however, do show a significant trend (Fisher's exact, $p \leq 0.05$; Figure 4.17, Table B.12). In the early urbanization sample, all adults with cribra orbitalia have the severe form, while the majority of subadults have the mild form. In addition, this is the only sample in which the severe form of cribra orbitalia is found; none of the age and sex cohorts in the pre-urbanization or late urbanization samples have the severe form of cribra orbitalia.

Porotic Hyperostosis

Temporal comparisons of the prevalence of porotic hyperostosis reveal that there are no significant trends for this systemic stress marker (chi-square, Fisher's exact, $p \leq 0.05$). Among adults, porotic hyperostosis remains relatively low over time (Figure 4.7, Table B.1). The same pattern is found for adult females and adult males, in which the prevalence of porotic hyperostosis does not change over time (Figures 4.8, 4.9; Tables B.2, B.3). Subadults also have no significant trend in porotic hyperostosis; the prevalence rate is temporally consistent (Figure 4.10, Table B.4). Sex-based comparisons show that males and females have similar prevalence rates of porotic hyperostosis in each of the temporal samples (Figure 4.11, Table B.5). Likewise, comparisons of adults and subadults reveal no significant difference in any of the temporal samples (Figure 4.12, Table B.6). However, over time, subadults do show an increase in porotic hyperostosis, although not significantly.

Temporal comparisons of severity of porotic hyperostosis lack any significant trends, as only the mild form of the stress marker is present in each of the temporal samples. The mild form of porotic hyperostosis is present in adults, adult females, adult

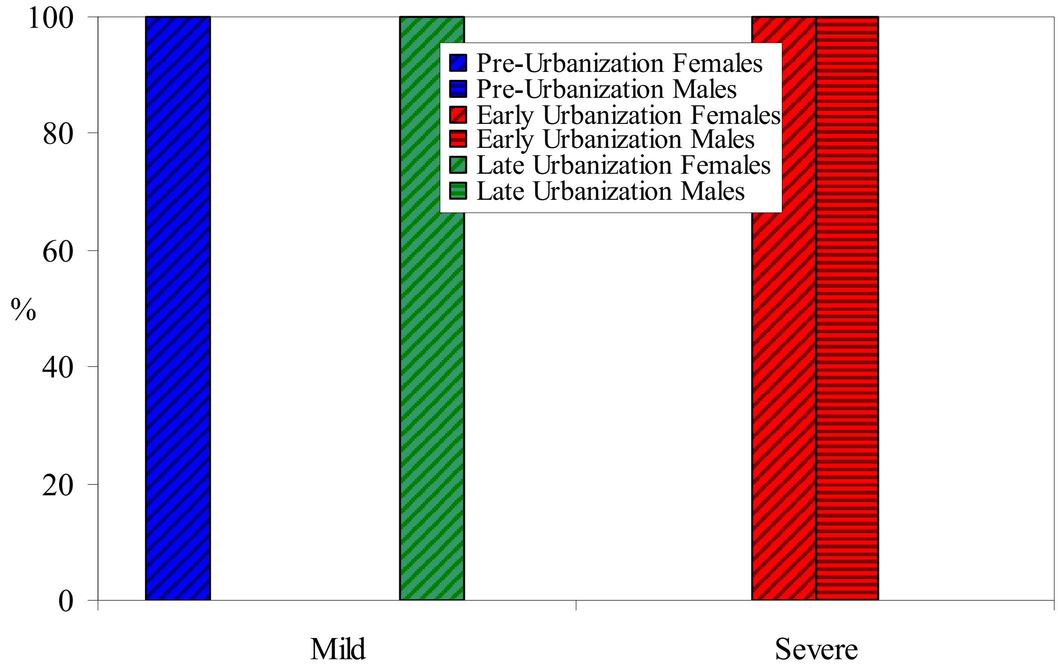

Figure 4.16. Sex-based comparison of percentages of adult males and females with cribra orbitalia that have mild and severe forms

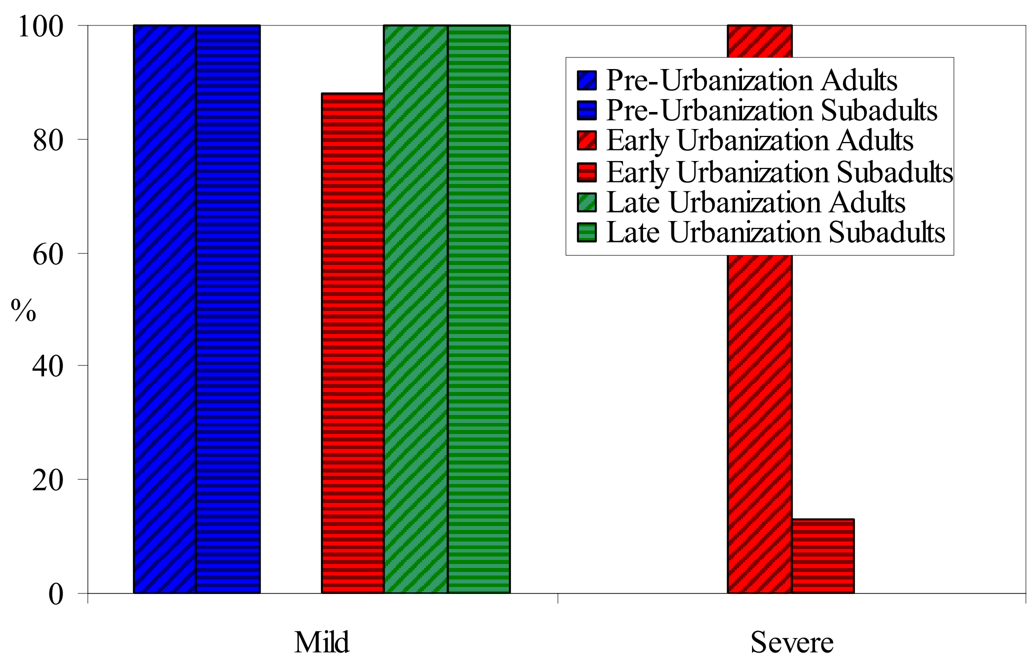

Figure 4.17. Age-based comparison of percentages of adults and subadults with cribra orbitalia that have mild and severe forms

males, and subadults (Tables B.13-B.16). Sex- and age-based comparisons reveal no significant differences, because there is only the mildest form severity of porotic hyperostosis in the sample as a whole (Tables B.17, B.18).

Enamel Hypoplasias

Comparisons of the prevalence and severity of enamel hypoplasias among the three temporal samples reveal a few significant trends. Among adults, the prevalence rate of enamel hypoplasias remains temporally consistent (Figure 4.18, Table B.1). The same pattern is found for adult females and adult males, in which the prevalence of the enamel hypoplasias does not change over time (Figures 4.19, 4.20; Tables B.2, B.3). Likewise, subadults also reveal the same consistent prevalence rates for enamel hypoplasias (Figure 4.21, Table B.4). Sex-based comparisons of enamel hypoplasias show no differences between males and females for any of the temporal samples (Figure 4.22, Table B.5). Age-based comparisons, however, do reveal a significant trend. The prevalence of enamel hypoplasias is significantly greater in subadults than in adults in the late urbanization sample (Fisher's exact, $p \leq 0.05$; Figure 4.23, Table B.6). The general trend for enamel hypoplasias is that over time, subadults have a greater prevalence than adults.

The number (single vs. multiple) of hypoplastic defects per tooth for the mandibular canine, mandibular incisor, maxillary canine, and maxillary incisor does not change temporally among adults, (Figure 4.18, Tables B.19-B.22). Within each temporal sample, adults have single and multiple hypoplastic defects. Adult females exhibit a significant trend for enamel hypoplasias of the mandibular canine (Figure 4.19, Tables B.23-B.26). All early urbanization females with enamel hypoplasias have single hypoplastic defects, while the majority of pre-urbanization females with enamel

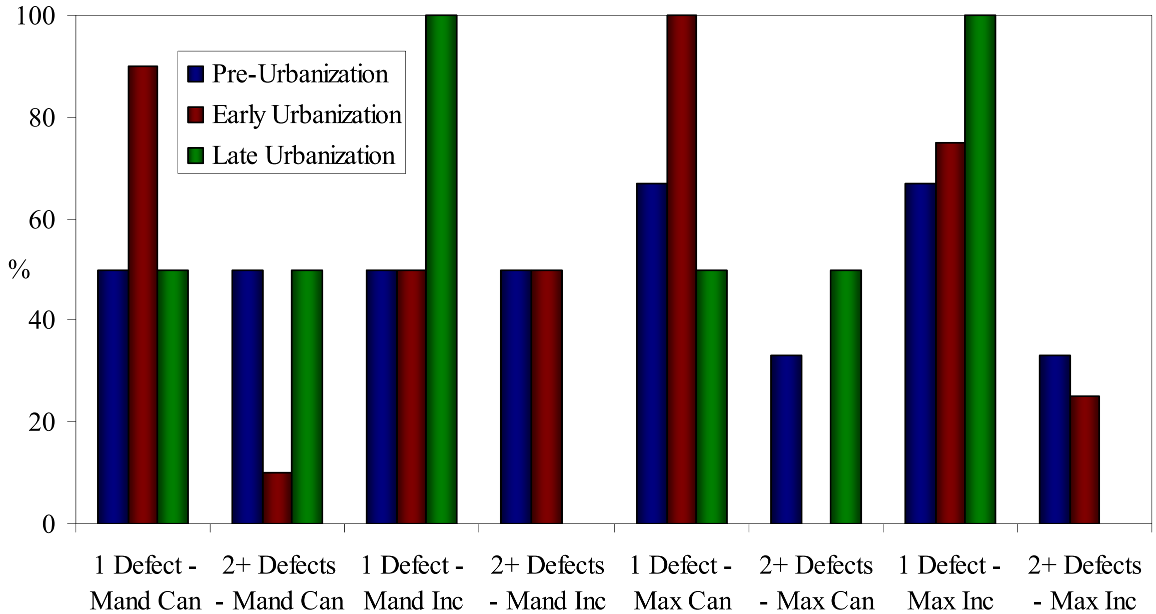

Figure 4.18. Percentages of adults with enamel hypoplasias that have single and multiple defects

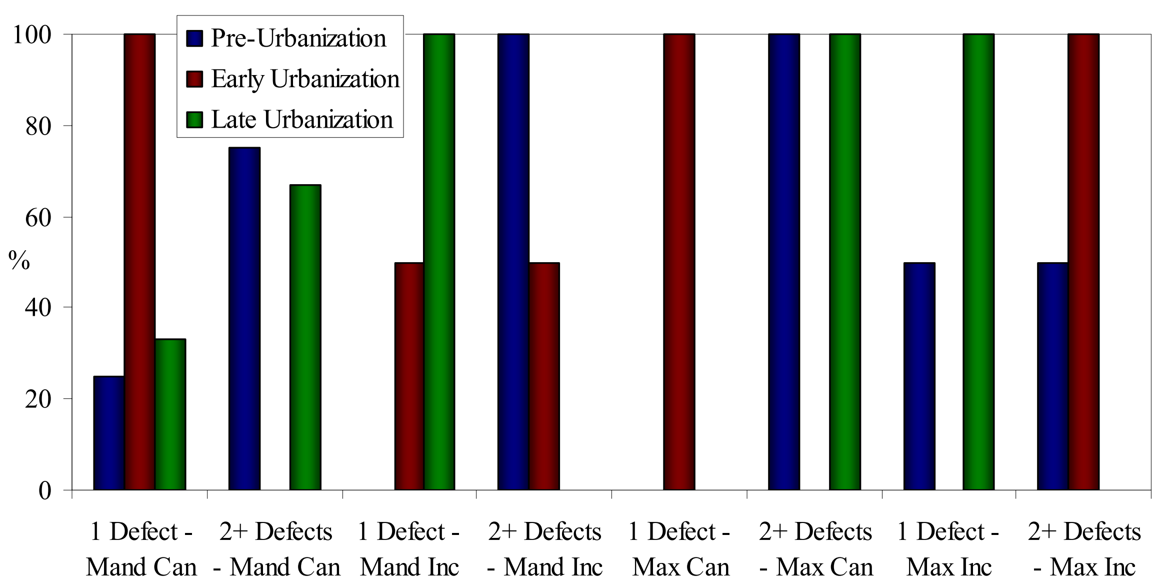

Figure 4.19. Percentages of adult females with enamel hypoplasias that have single and multiple defects

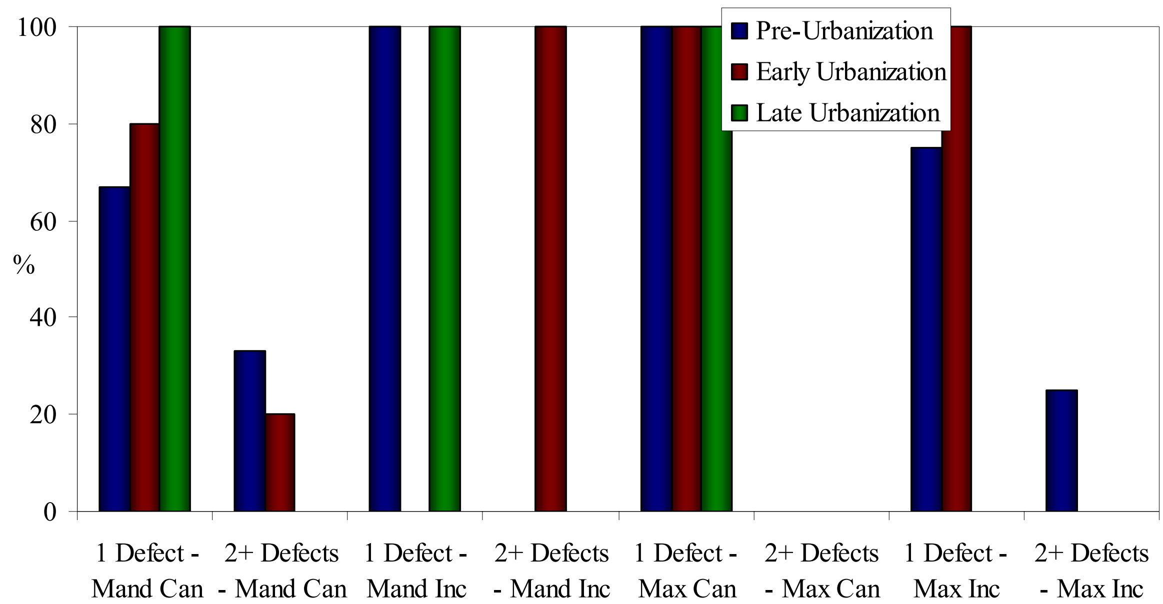

Figure 4.20. Percentages of adult males with enamel hypoplasias that have single and multiple defects

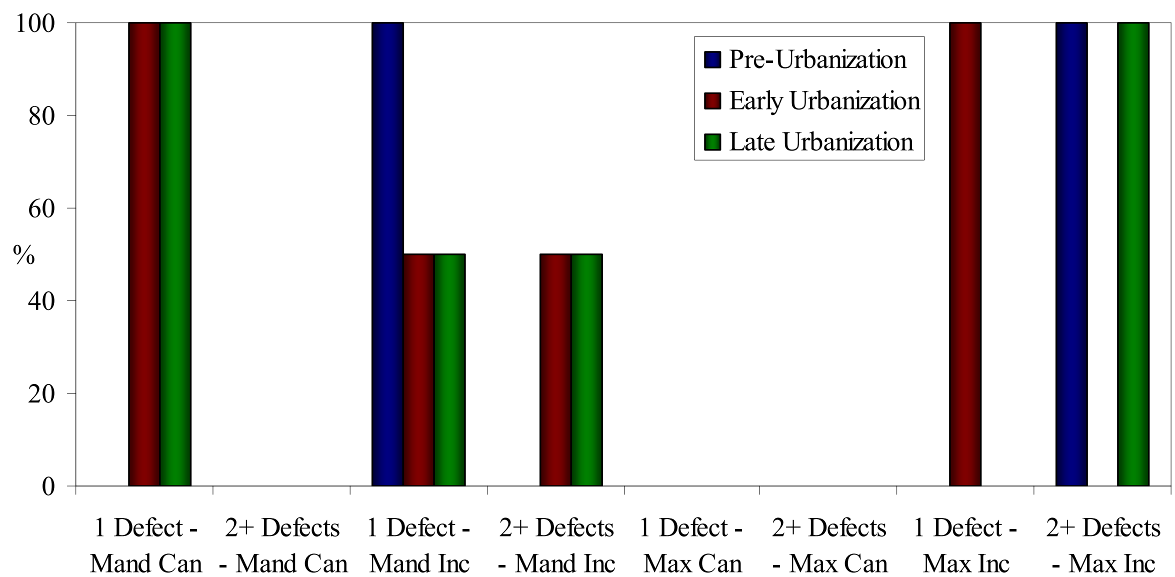

Figure 4.21. Percentages of subadults with enamel hypoplasias that have single and multiple defects

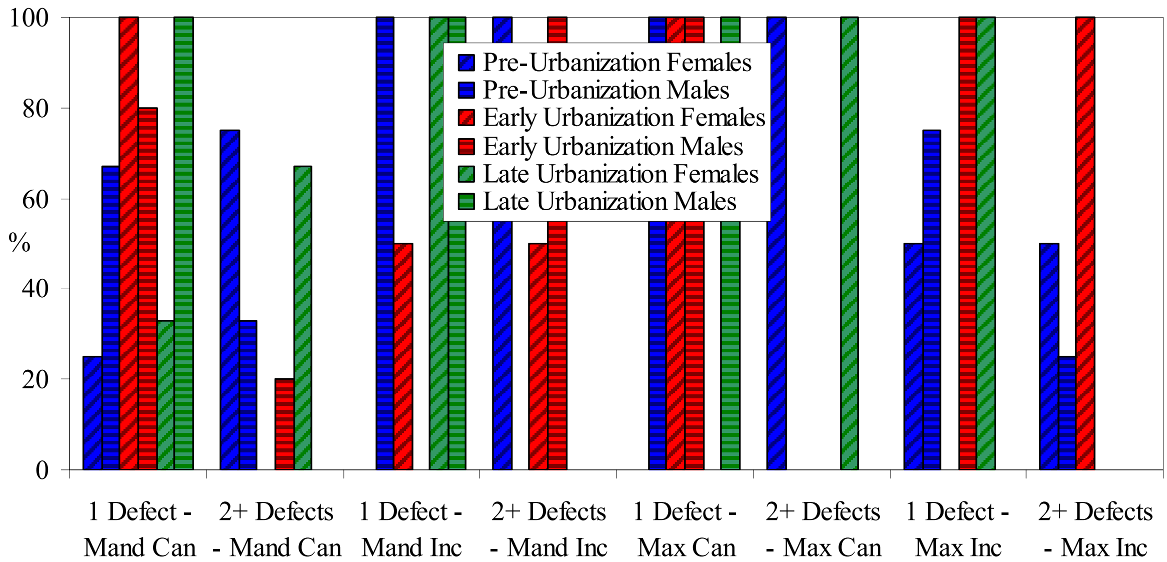

Figure 4.22. Sex-based comparison of percentages of adult males and females with enamel hypoplasias that have single and multiple defects

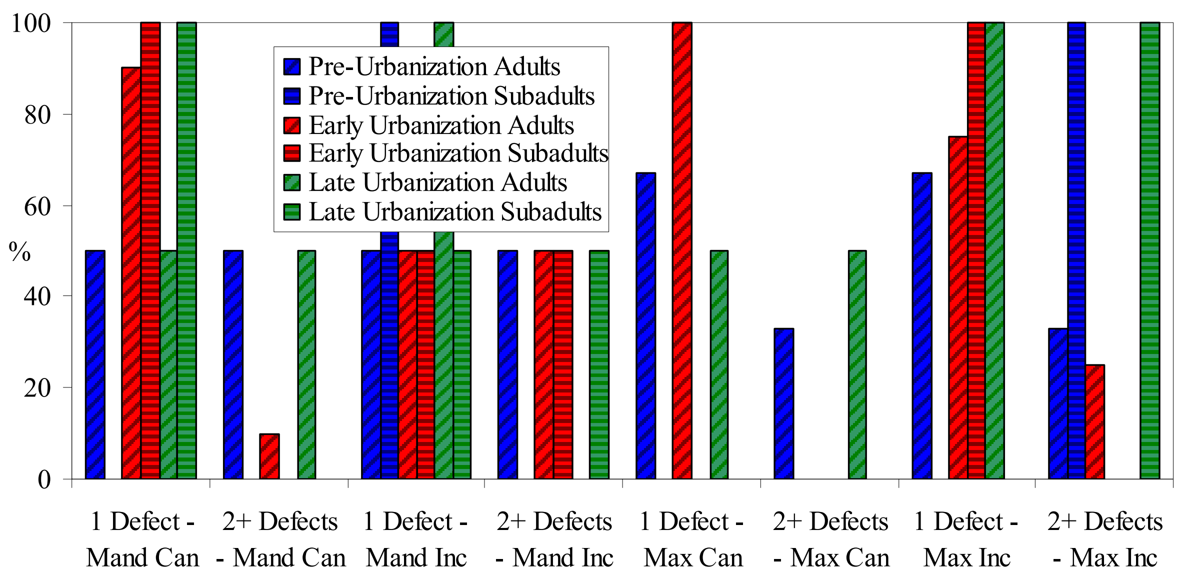

Figure 4.23. Age-based comparison of percentages of adults and subadults with enamel hypoplasias that have single and multiple defects

hypoplasias have multiple hypoplastic defects (Fisher's exact, $p \leq 0.05$). Comparisons of the number of enamel hypoplasias per tooth for the mandibular incisor, maxillary canine, and maxillary incisor do not reveal any significant temporal differences. Among adult males, there are no significant trends in the number of enamel hypoplasias (Figure 4.20, Tables B.27-B.30). Temporal comparisons of the number of hypoplastic defects per tooth in subadults could only be conducted for the mandibular and maxillary incisors; there were no hypoplastic defects found on the maxillary canines and only single defects on the mandibular canines. For the incisors, subadults do not differ significantly in the number of defects among the three temporal samples (Figure 4.21, B.31-B.33). Likewise, sex-based and age-based comparisons of the number of enamel hypoplasias per tooth for the incisors and canines reveal no significant results (Figures 4.22, 4.23; Table B.34-B.41).

Skeletal Indicators of Health: Infection

Periostitis

No significant trends are found in the temporal comparisons of the prevalence of periostitis. Comparison of adults, adult females, adult males, and subadults for the presence of periostitis reveals no significant differences among the three temporal samples (Figures 4.24-4.27; Tables B.42, B.45, B.48, B.51). Sex-based and age-based comparisons of the prevalence of periostitis in each of the three temporal periods also have no significant results (Figures 4.28-4.29; Tables B.54, B.57). Despite this, there are two comparisons that approach significance ($p=0.07$). In the pre-urbanization sample, 38% of adults have periostitis, but none of the subadults do and in

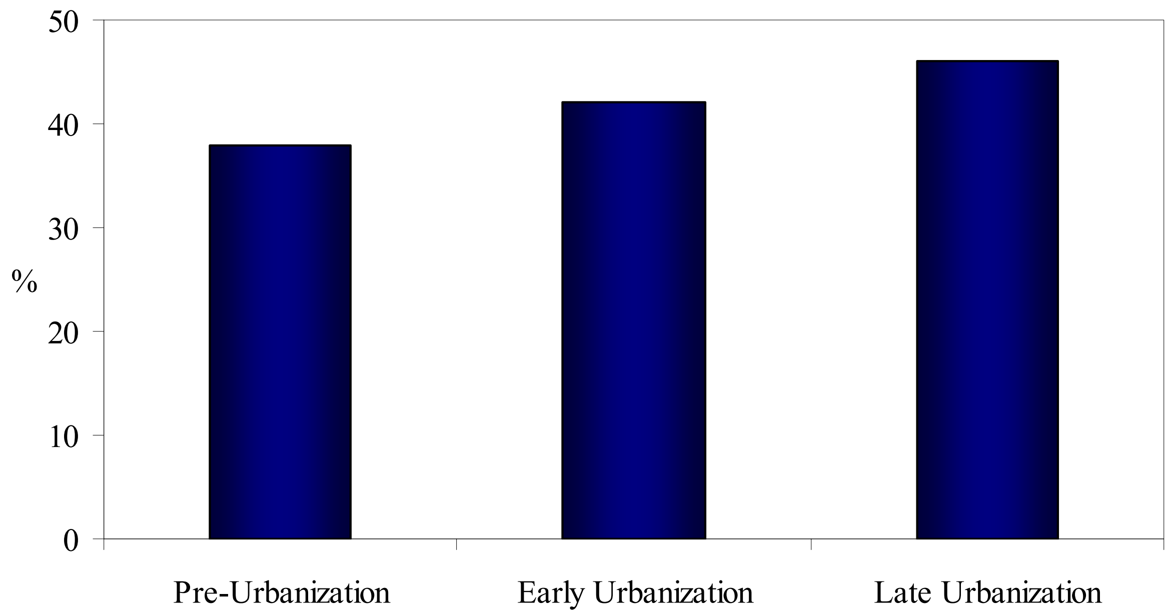

Figure 4.24. Percentage of adults with periostitis

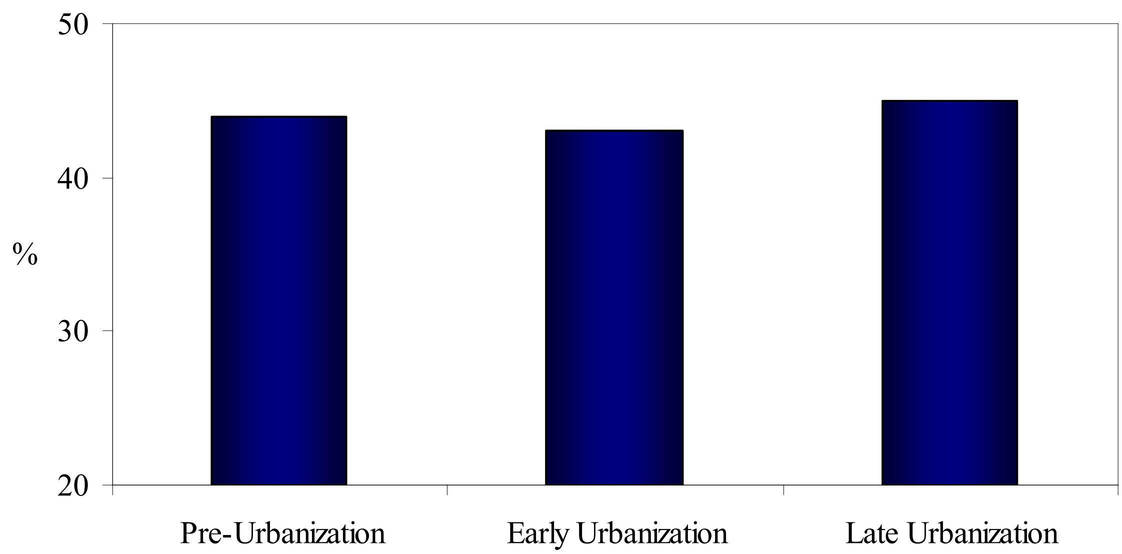

Figure 4.25. Percentage of adult females with periostitis

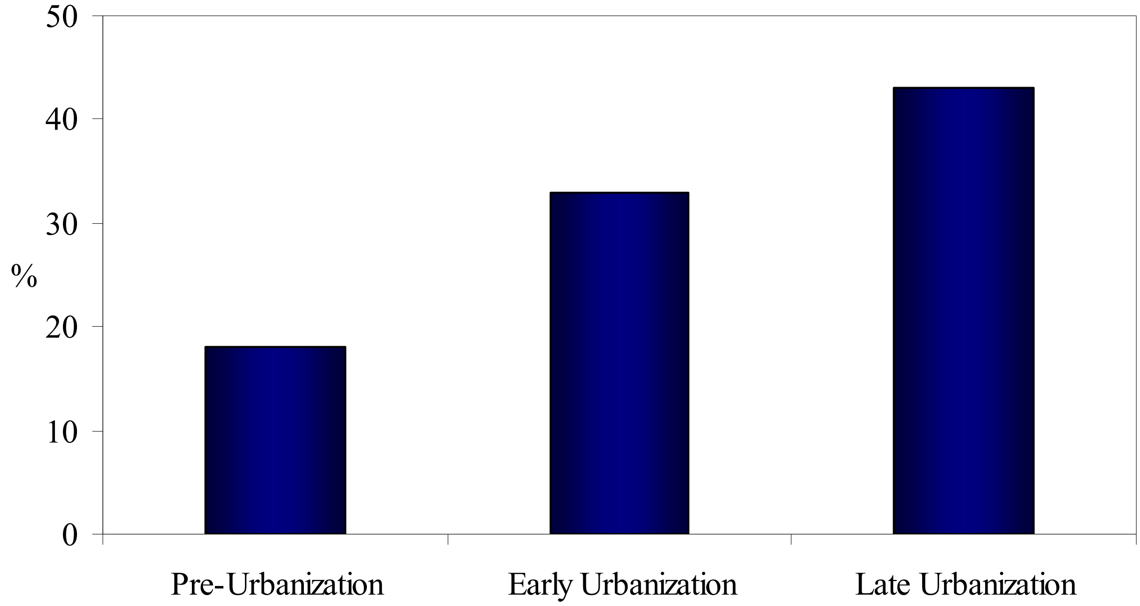

Figure 4.26. Percentage of adult males with periostitis

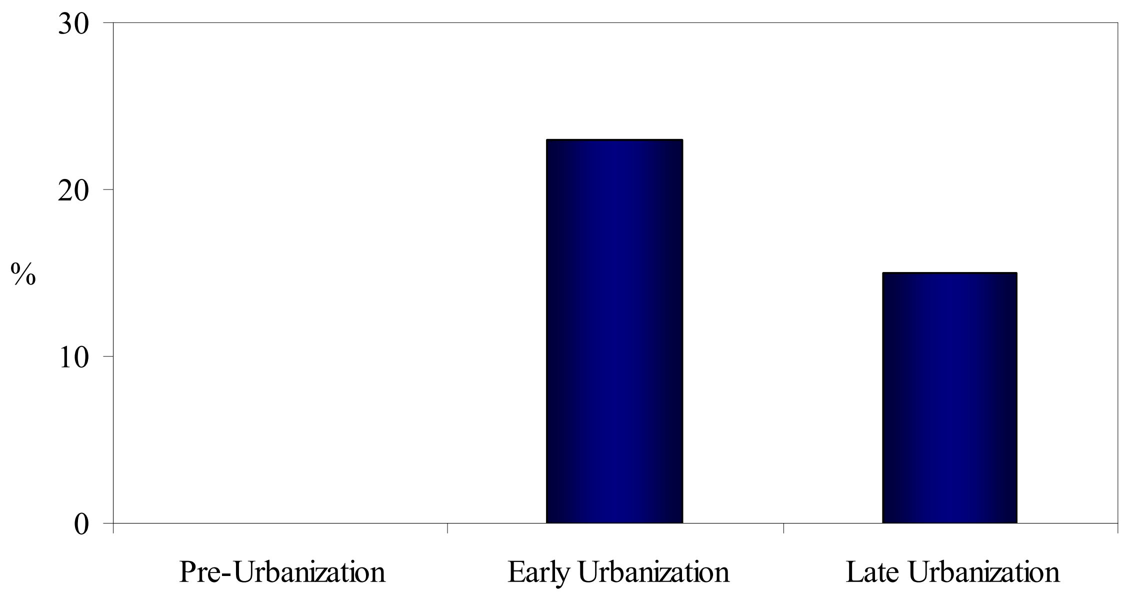

Figure 4.27. Percentage of subadults with periostitis

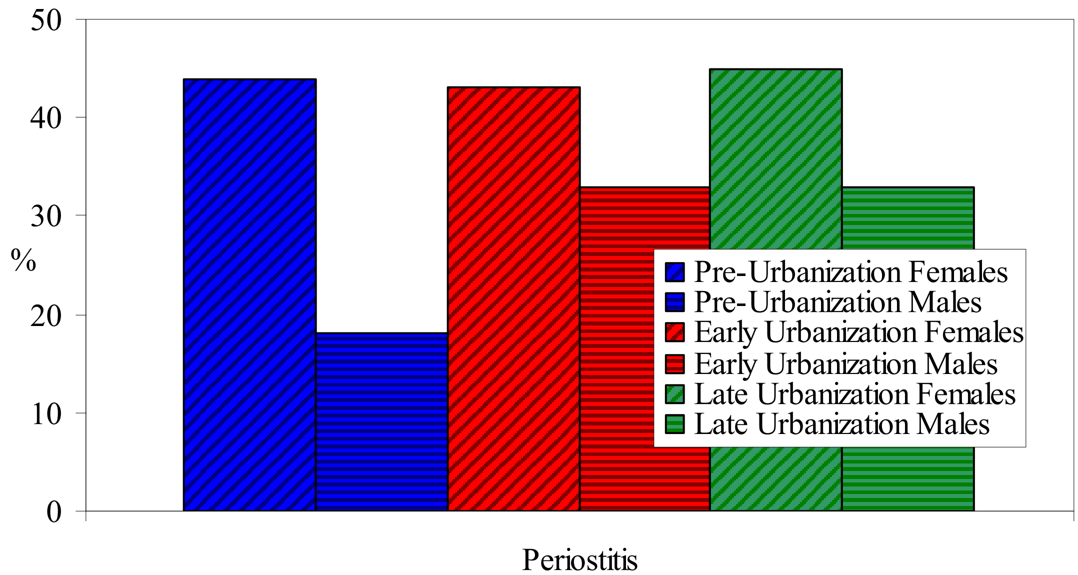

Figure 4.28. Sex-based comparison of percentages of adult males and females with periostitis

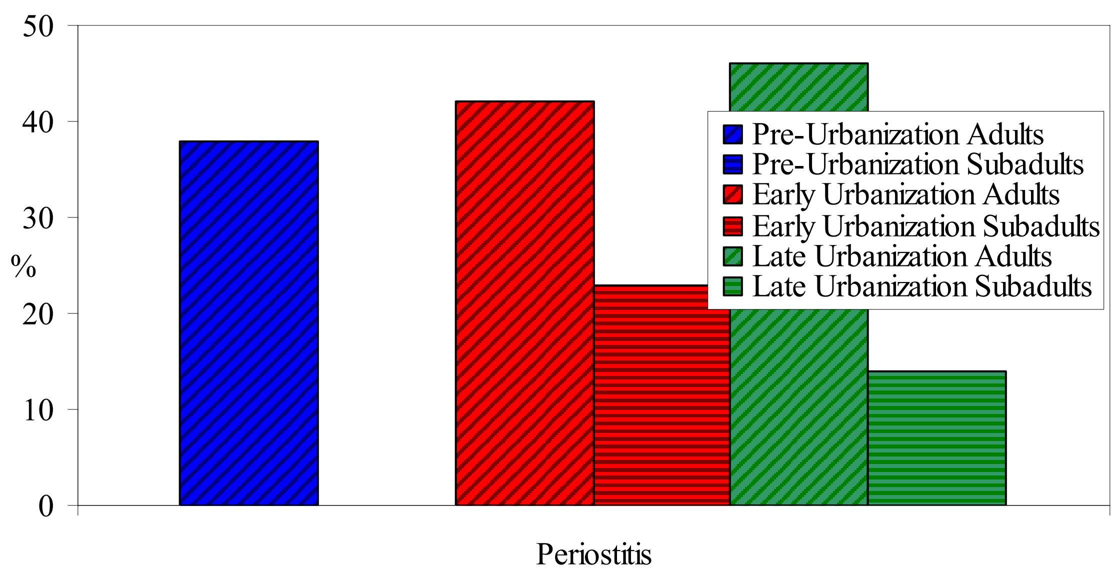

Figure 4.29. Age-based comparison of percentages of adults and subadults with periostitis

the late urbanization, 46% of the adults and 14% of the subadults have periostitis. While not statistically significant, a general pattern is noted.

Temporal comparisons of individual bones (i.e., clavicle, humerus, radius, ulna, femur, tibia, and fibula) also do not reveal any significant trends. In adults, the right and left humeri, right radius, and right ulna are not affected by periostitis in any period (Figure 4.30; Table B.43). Additionally, the right and left tibiae are most often affected and in some cases, all adults demonstrate periostitis of the tibia (Figure 431, Table B.44). Adult females do not have periostitis on the right and left clavicles, right and left humeri, right radius, right ulna, and right femur (Figure 4.32, Table B.46). Again, the right and left tibiae are most often affected, as all adult females express periostitis of the tibia (Figure 4.33, Table B.47). In adult males, no bones of the arm are affected by periostitis (Figure 4.34, Table B.49). Periostitis most often affects the right and left tibiae of adult males and in some cases the prevalence rate is 100% (Figure 4.35, Table B.50). Subadults only show periostitis on the right radius, right ulna, right femur, and right and left tibiae. No other skeletal elements have a periosteal reaction (Figures 4.36, 4.37; Tables B.52 B.53). Like the adults, the tibiae are most often affected. Sex-based and age-based comparisons also do not show any significant differences in any sample (Figures 4.38-4.41; Tables B.55, B.56, B.58, B.59).

Temporal comparisons of the severity of periostitis reveal a single significant trend (Fisher's exact, $p \leq 0.05$). In the age-based comparison, during the early urbanization, the majority of adults with periostitis of the left tibia have level 2 severity (longitudinal striations), while the majority of subadults with periostitis of the left tibia have level 3 severity (small areas of reactive bone) (Figure 4.42, Table B.84). In adults,

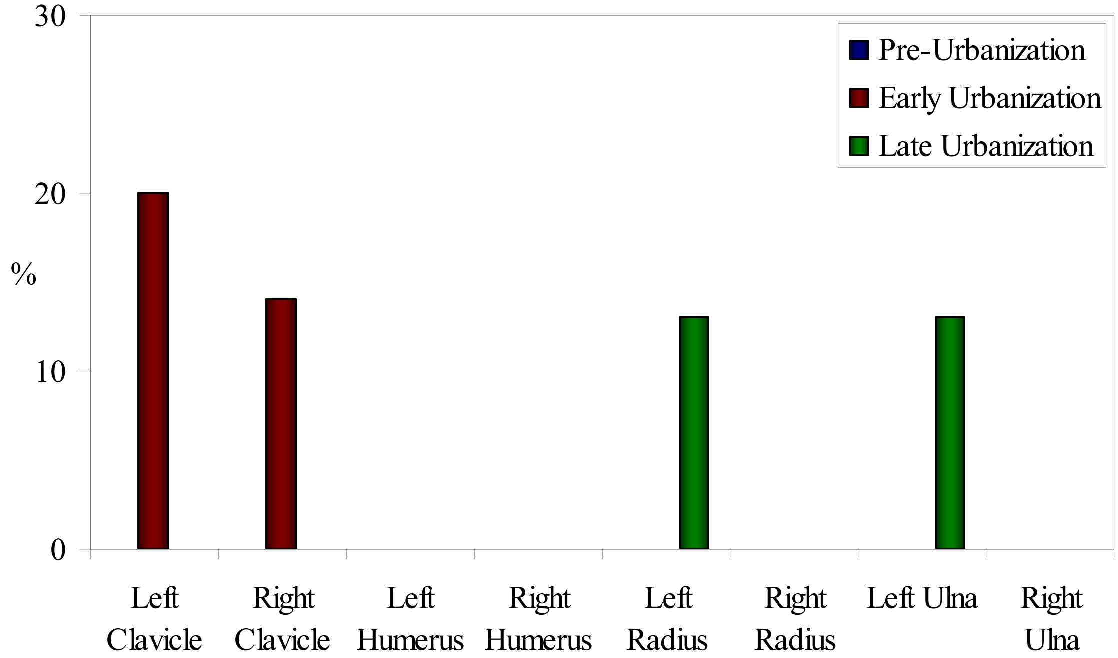

Figure 4.30. Percentage of adults with periostitis – upper limbs

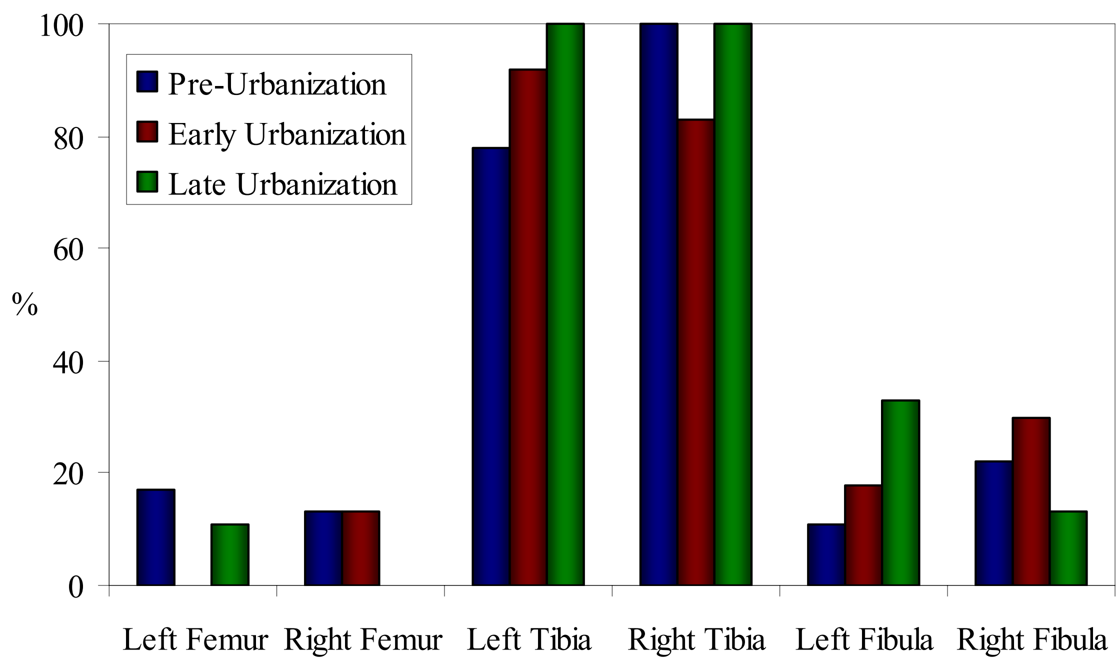

Figure 4.31. Percentage of adults with periostitis – lower limbs

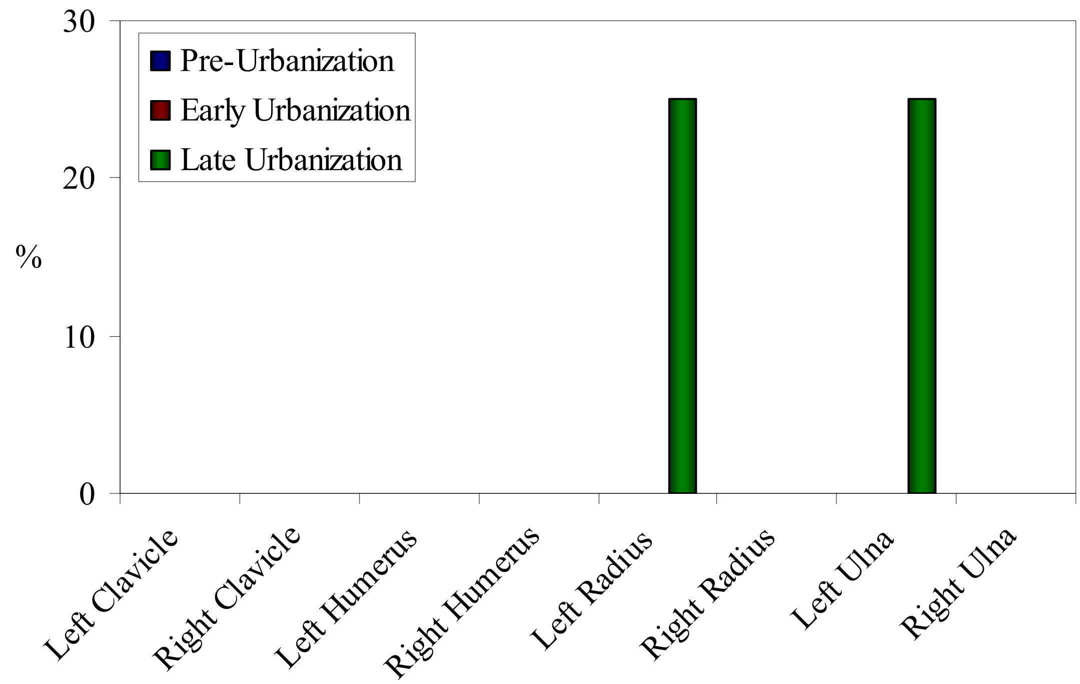

Figure 4.32. Percentages of adult females with periostitis – upper limbs

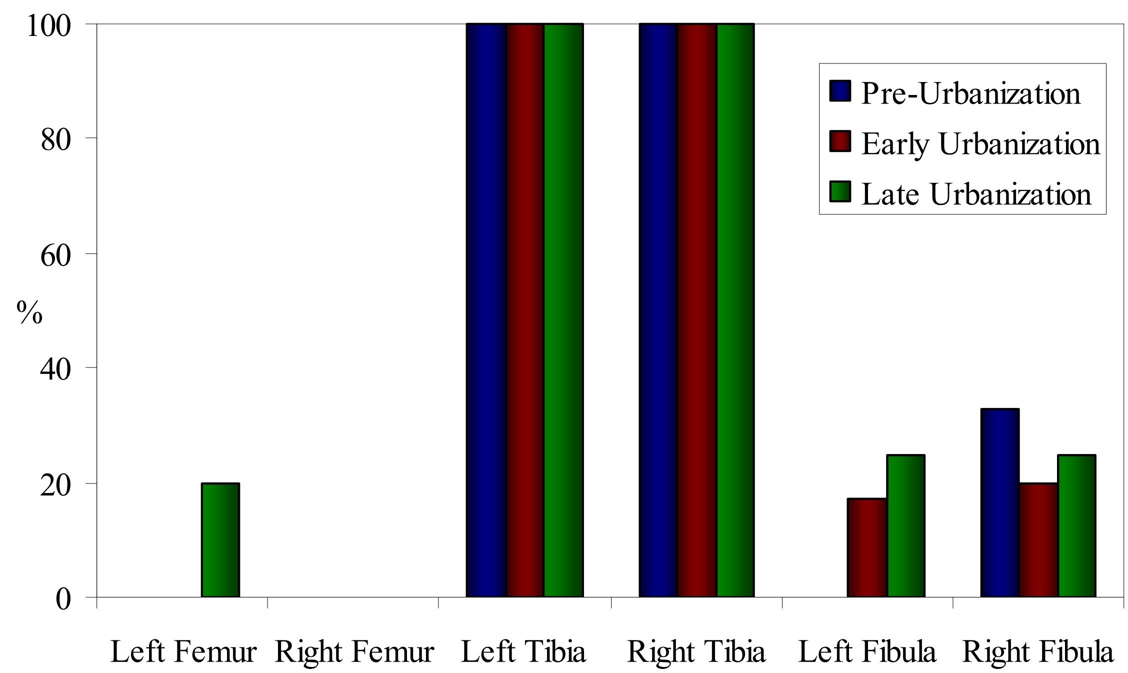

Figure 4.33. Percentages of adult females with periostitis – lower limbs

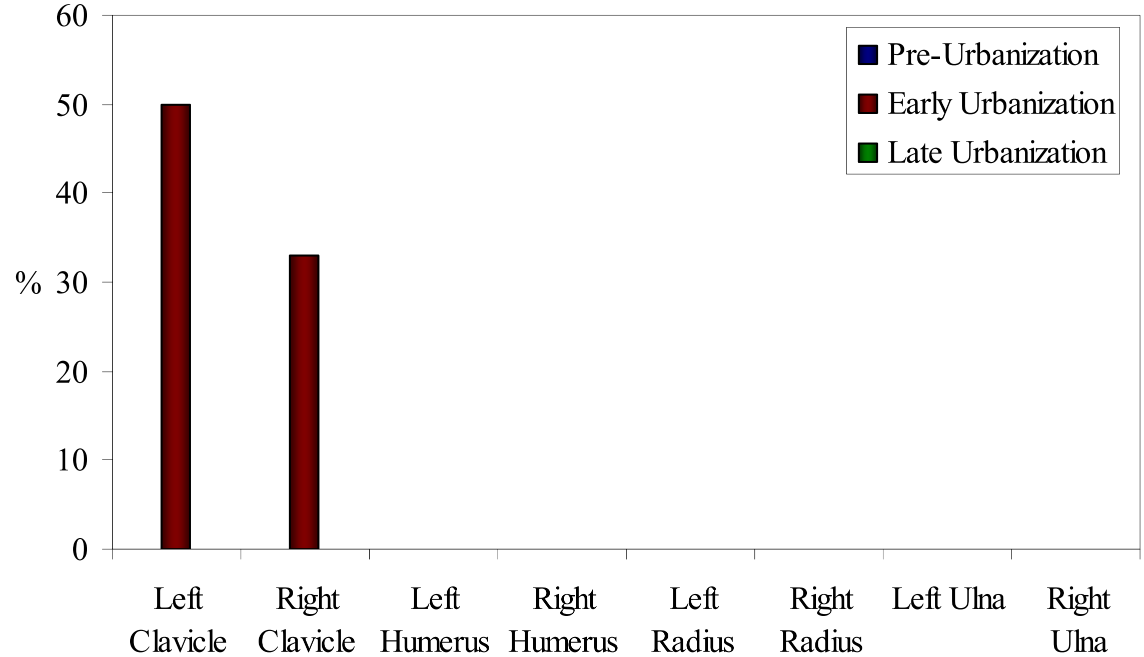

Figure 4.34. Percentage of adult males with periostitis – upper limbs

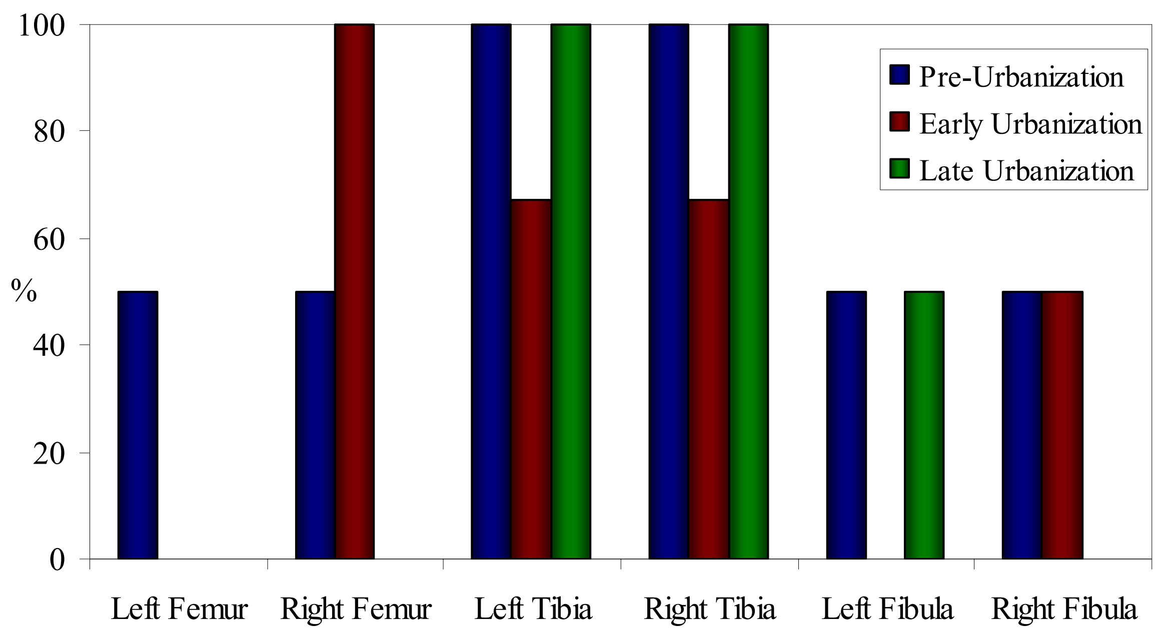

Figure 4.35. Percentage of adult males with periostitis – lower limbs

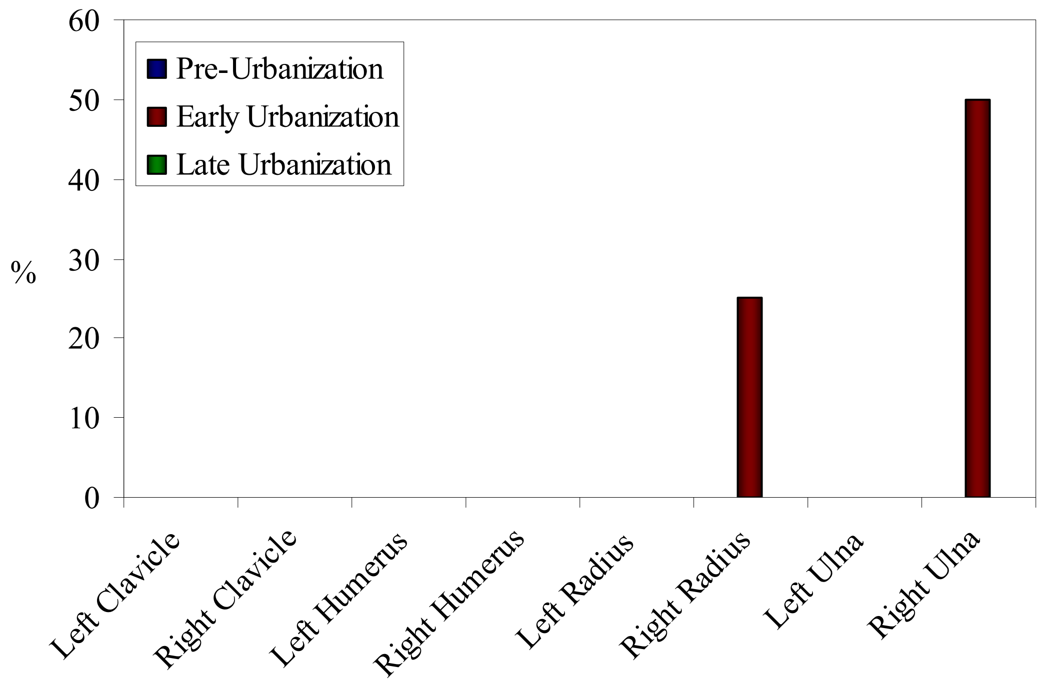

Figure 4.36. Percentage of subadults with periostitis – upper limbs

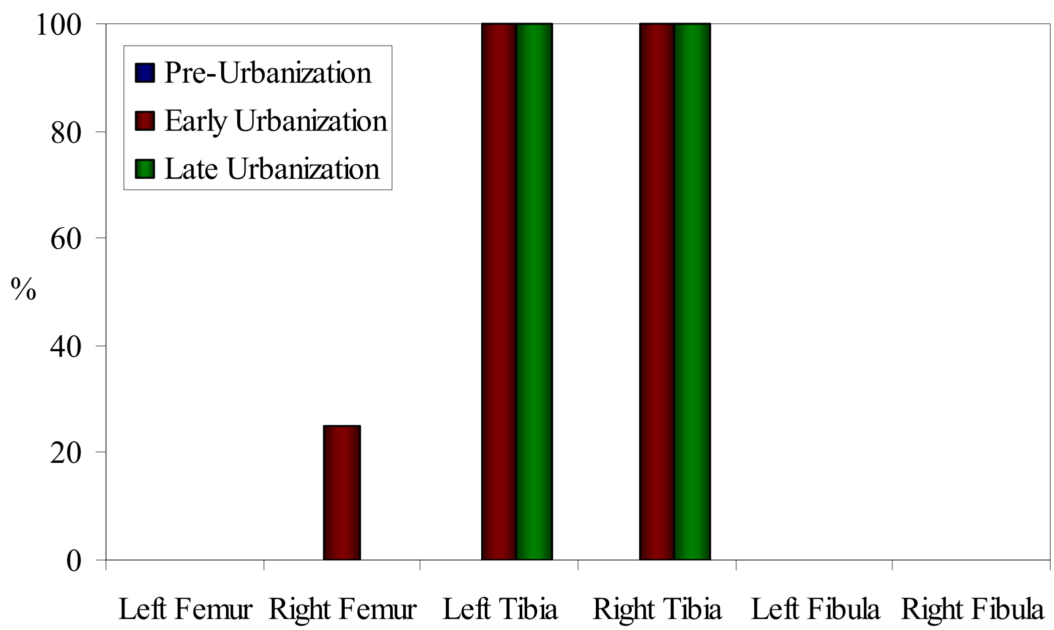

Figure 4.37. Percentage of subadults with periostitis – lower limbs

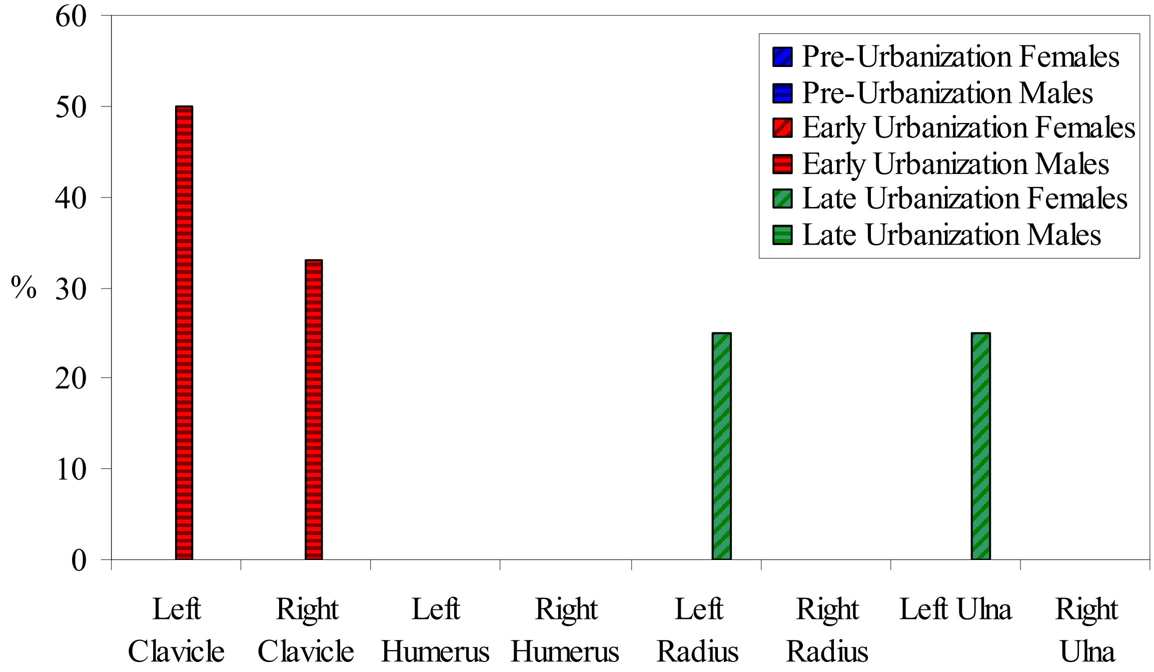

Figure 4.38. Sex-based comparison of percentage of adult males and females with periostitis – upper limbs

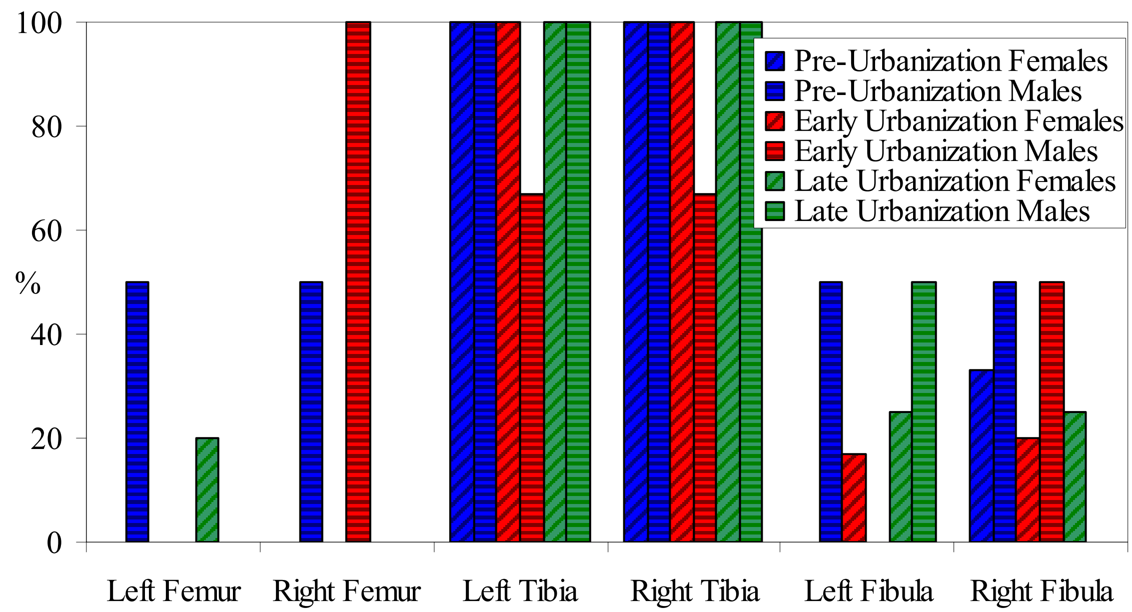

Figure 4.39. Sex-based comparison of percentages of adult males and females with periostitis – lower limbs

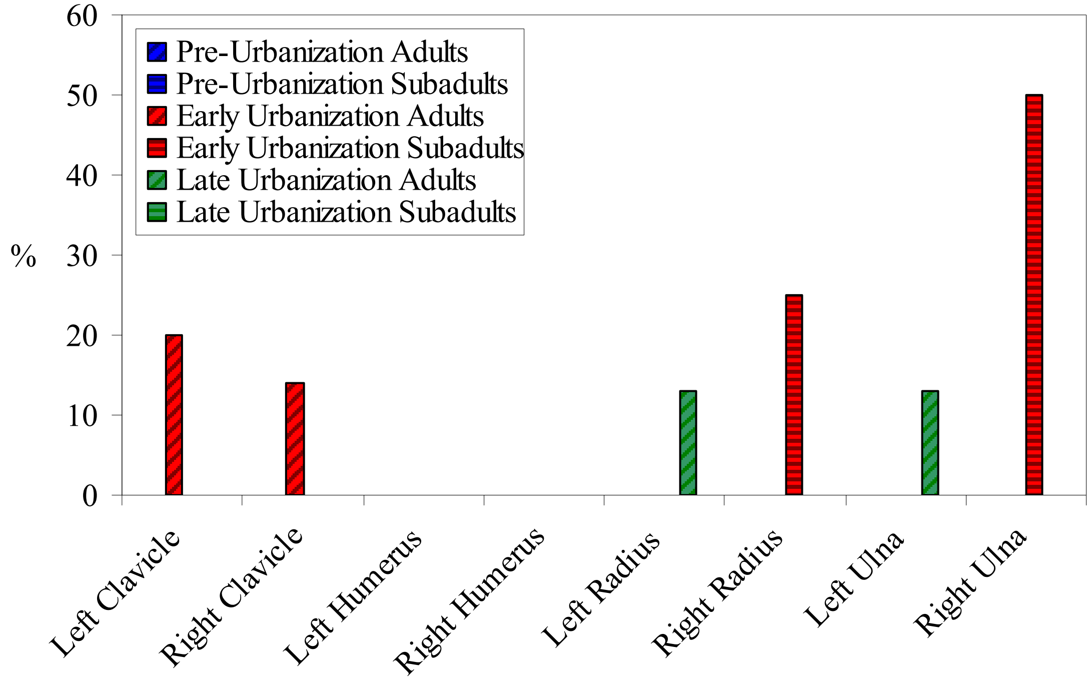

Figure 4.40. Age-based comparison of percentages of adults and subadults with periostitis – upper limbs

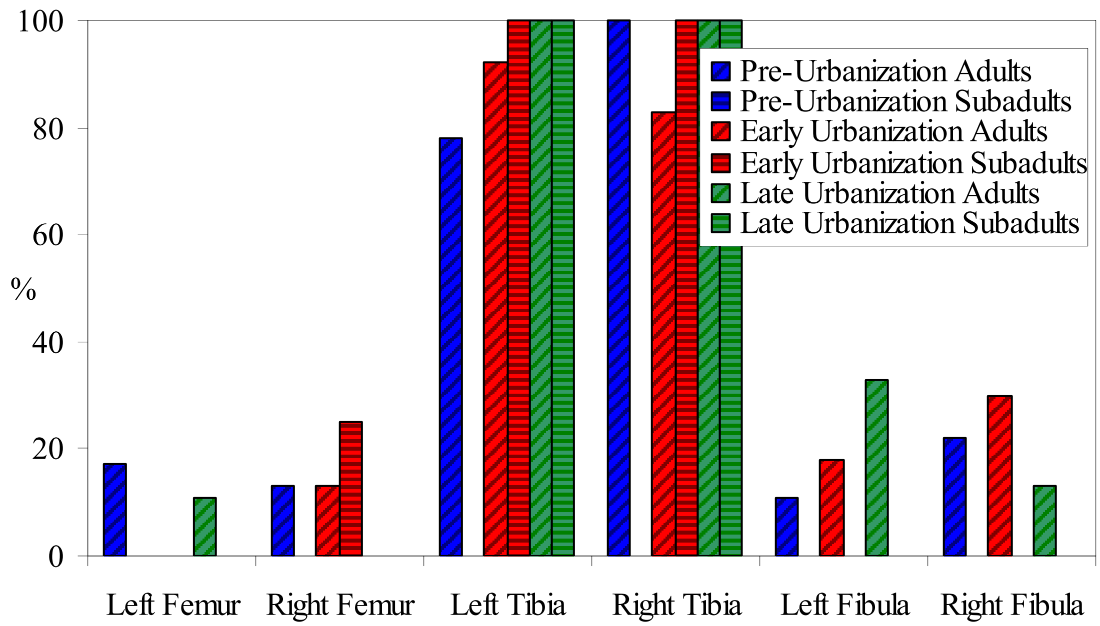

Figure 4.41. Age-based comparison of percentages of adults and subadults with periostitis – lower limbs

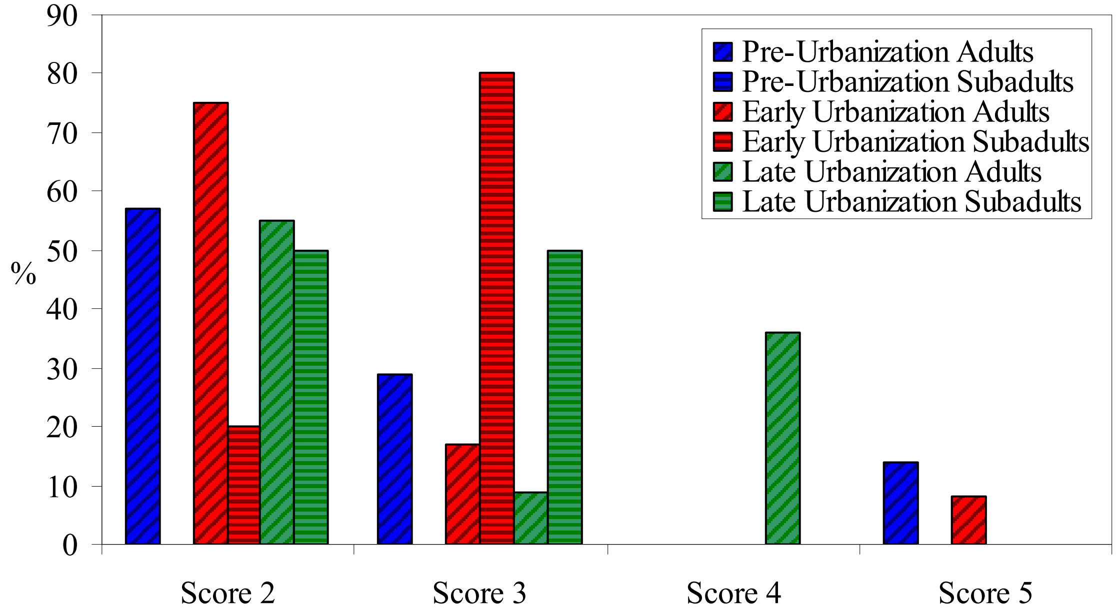

Figure 4.42. Age-based comparison of percentages of adults and subadults with periostitis of the left tibia by severity

many skeletal elements only expressed a single level of severity, including right and left clavicles, right femur, left radius, and left ulna (Table B.65). The left femur, right and left tibiae, and right and left fibulae expressed more than one level of severity, but there was no significant difference in the prevalence of each level (Figures 4.43-4.47, Tables B.60-B.64). Adult females with periostitis of the left radius, left ulna, and left femur only had a single level of severity, while the right and left tibiae and right and left fibulae expressed multiple levels of severity (Figures 4.48-4.51; Tables B.66-B.70). Adult males, on the other hand, only had one level of severity for the right and left clavicles and right and left femora; the tibiae and fibulae expressed several levels of severity (Figures 4.52-4.55; Tables B.71-B.75). Subadults had fewer skeletal elements with periosteal reactions. Only the right and left tibiae showed multiple levels of severity, while the right radius, right ulna, and right femur expressed a single level of severity (Figures 4.56-4.57, Tables B.76-B.78). Sex-based comparisons of the severity of periostitis were conducted for the right and left tibiae and right and left fibulae; however, they reveal no significant trends in any of the temporal samples (Figures 4.58-4.61; Tables B.79-B.83). With the exception of the one significant trend, age-based comparisons of periostitis severity in each of the three samples also lacked significant results. Comparisons were conducted for the right and left tibiae and right and left fibulae (Figures 4.42. 4.62-4.64; Tables B.84-B.88).

Specific Infectious Diseases

Temporal comparisons of the prevalence of indicators of specific infectious diseases (leprosy, treponematosis, tuberculosis) reveal no significant trends for any age or sex cohort. In adults, overall, evidence of specific infectious diseases is minimal in all periods (Figure 4.65, Table B.89). There is only a single individual with rib lesions that

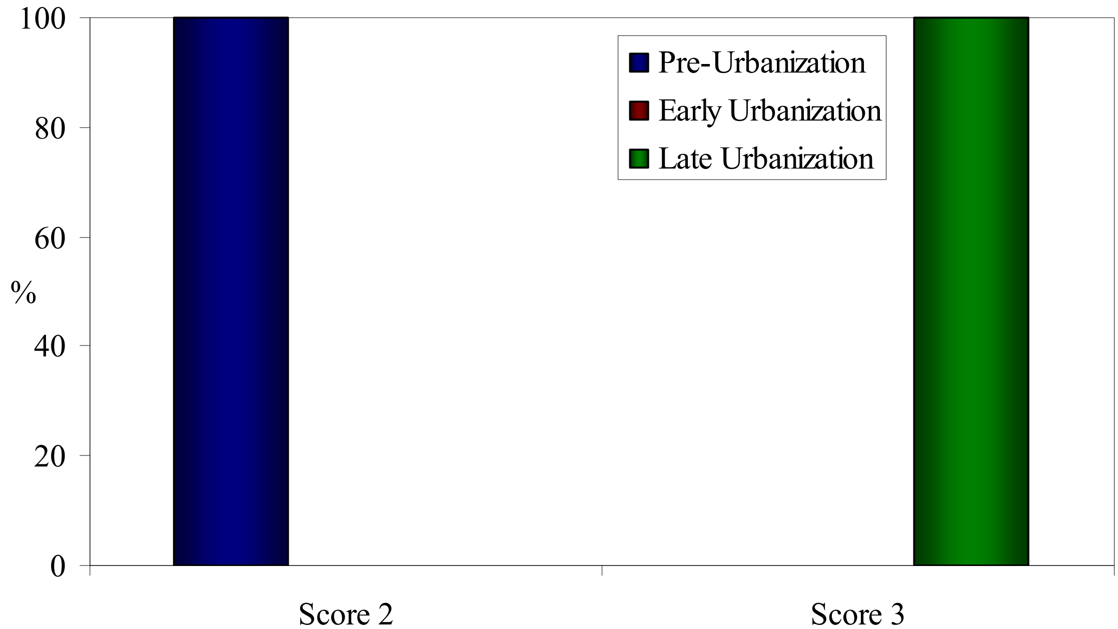

Figure 4.43. Percentage of adults with periostitis of the left femur by severity

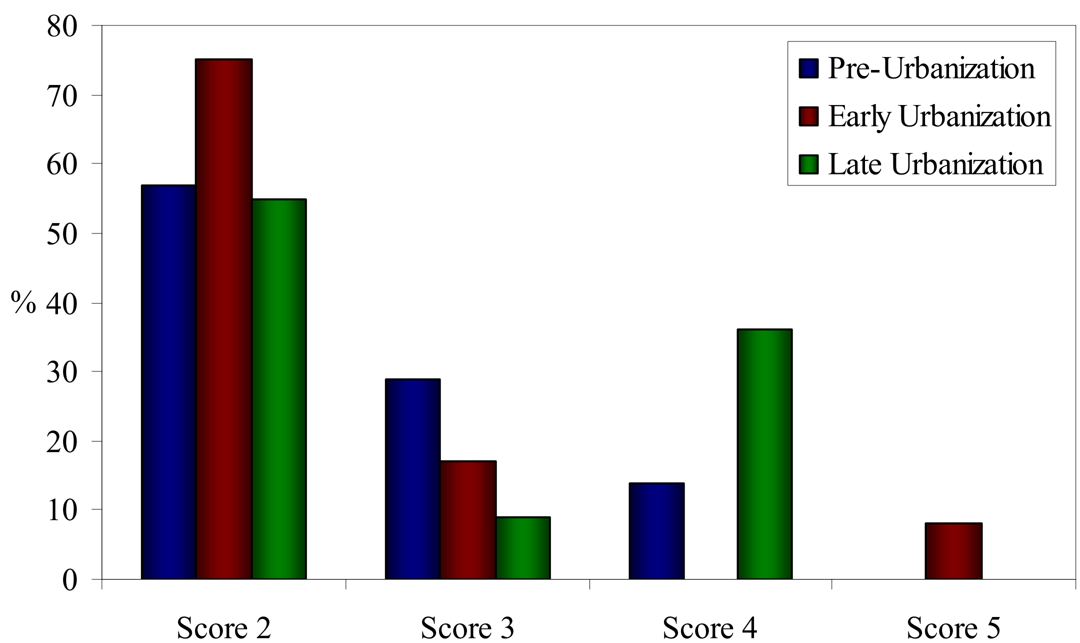

Figure 4.44. Percentage of adults with periostitis of the left tibia by severity

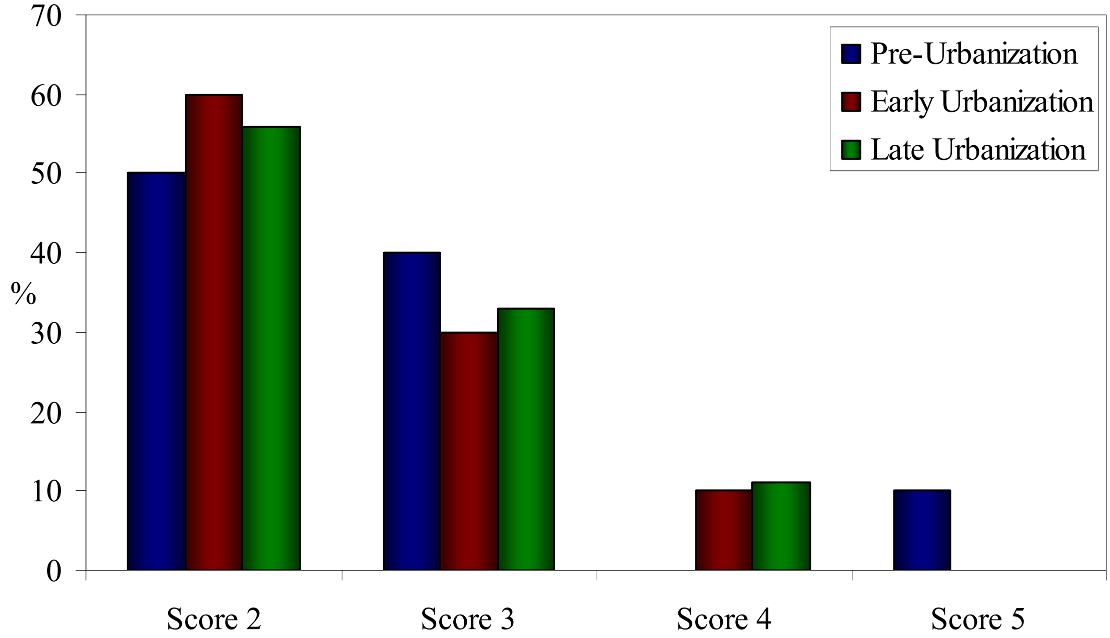

Figure 4.45. Percentage of adults with periostitis of the right tibia by severity

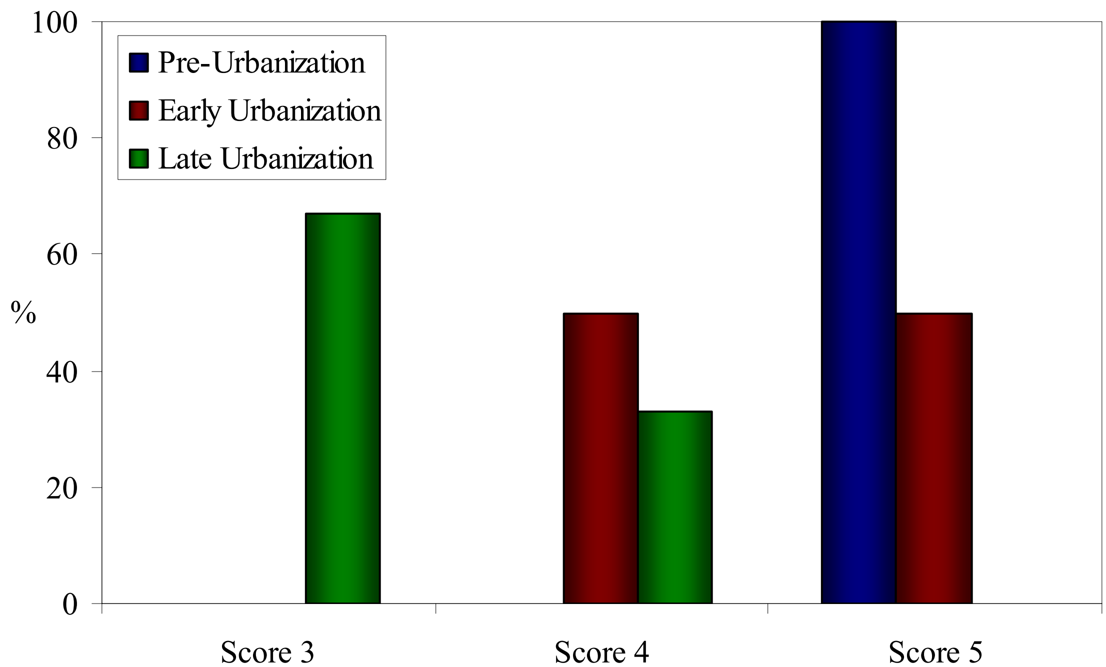

Figure 4.46. Percentage of adults with periostitis of the left fibula by severity

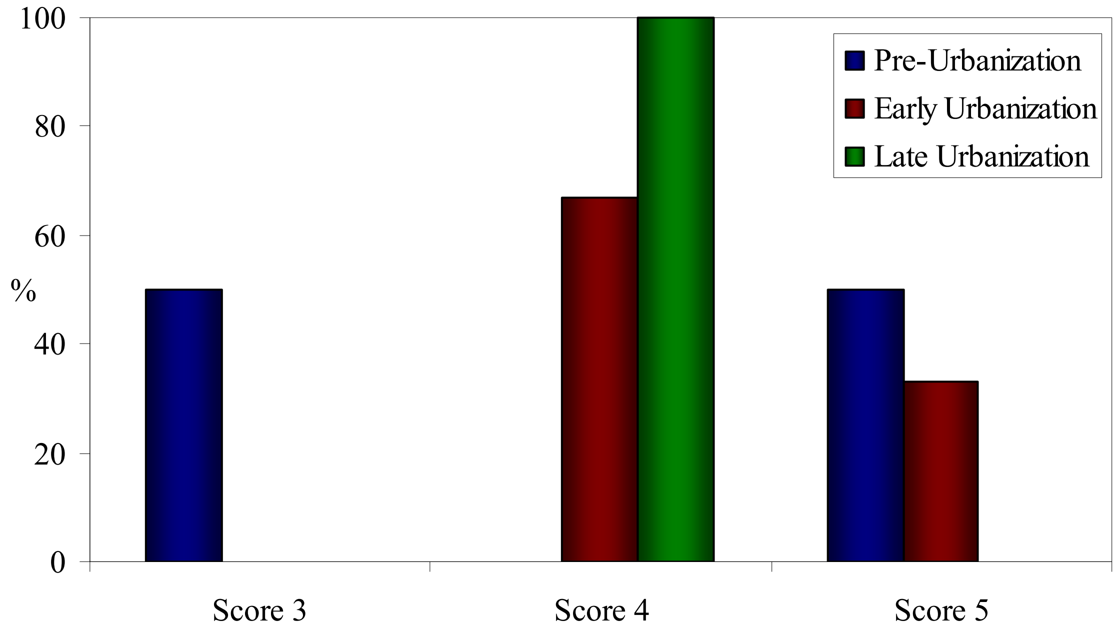

Figure 4.47. Percentage of adults with periostitis of the right fibula by severity

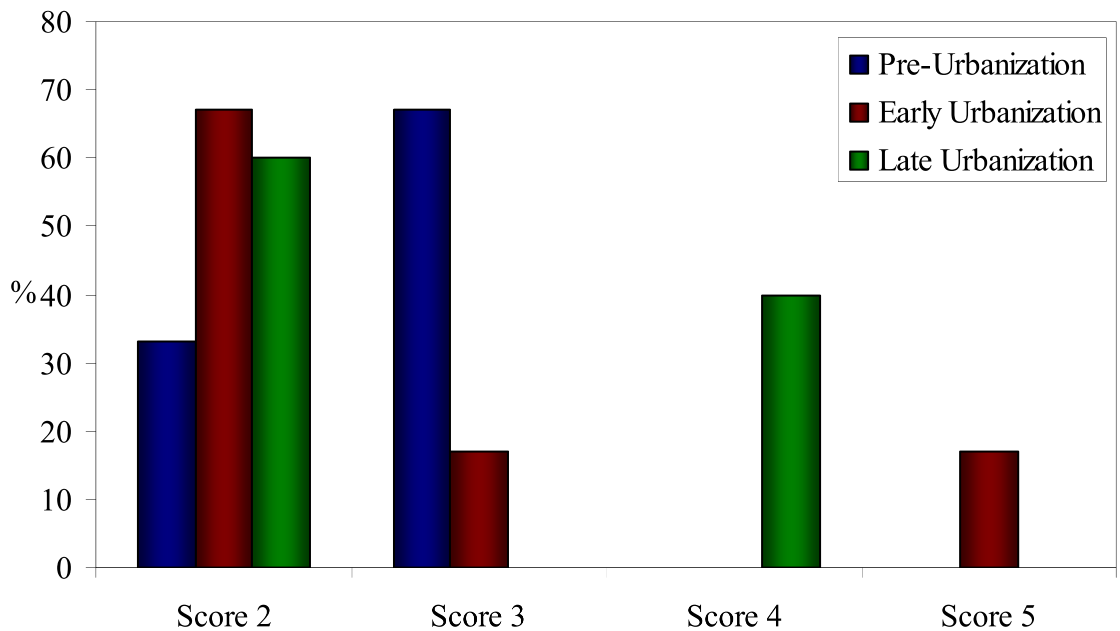

Figure 4.48. Percentage of adult females with periostitis of the left tibia by severity

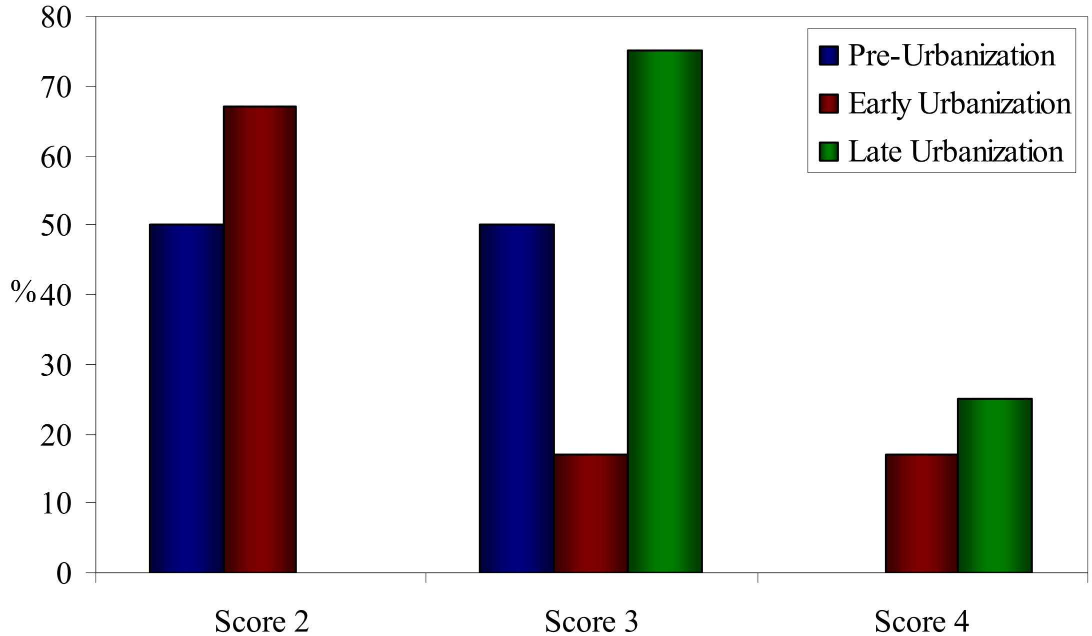

Figure 4.49. Percentage of adult females with periostitis of the right tibia by severity

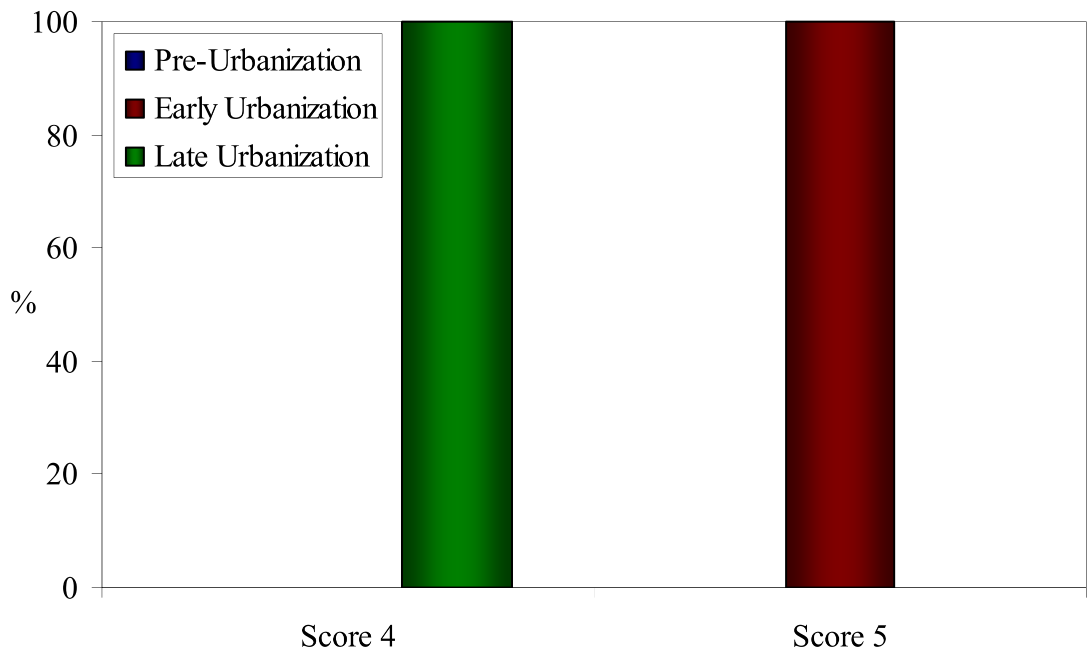

Figure 4.50. Percentage of adult females with periostitis of the left fibula by severity

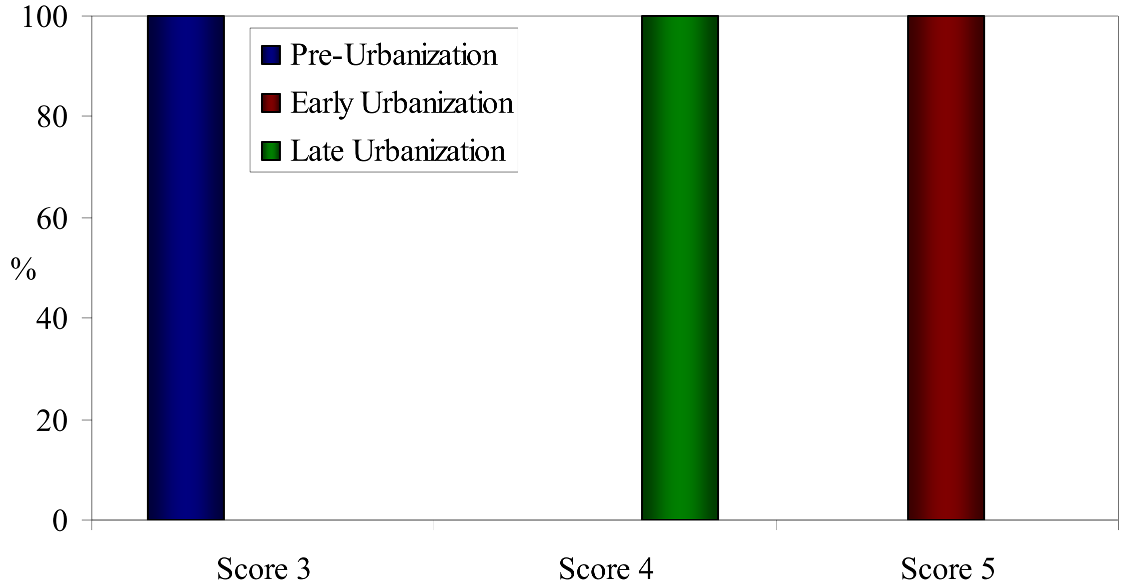

Figure 4.51. Percentage of adult females with periostitis of the right fibula by severity

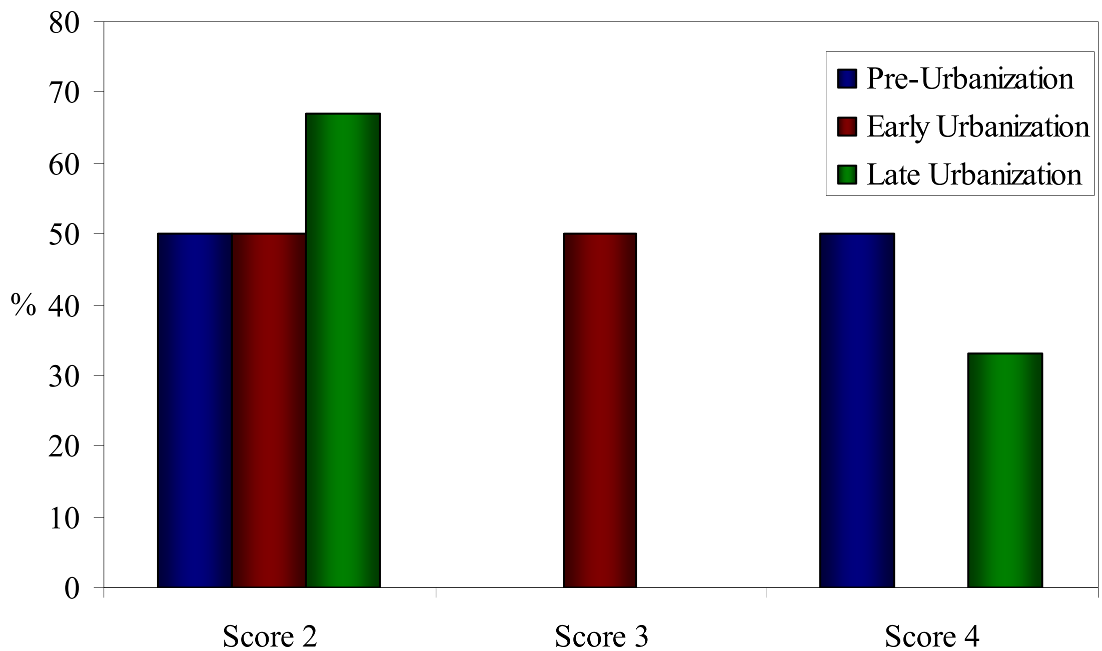

Figure 4.52. Percentage of adult males with periostitis of the left tibia by severity

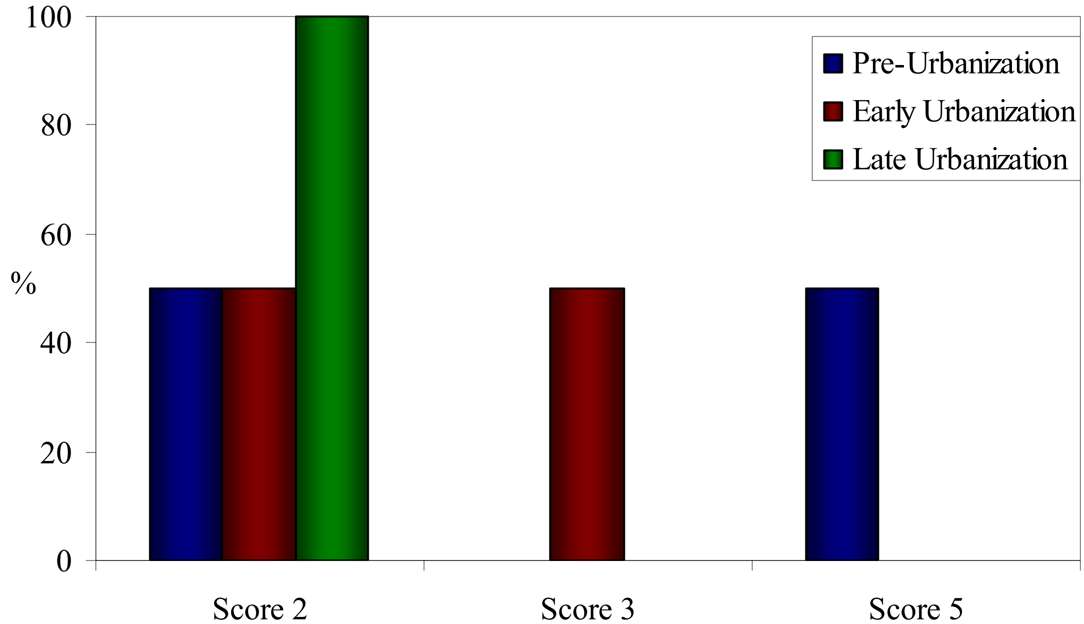

Figure 4.53. Percentage of adult males with periostitis of the right tibia by severity

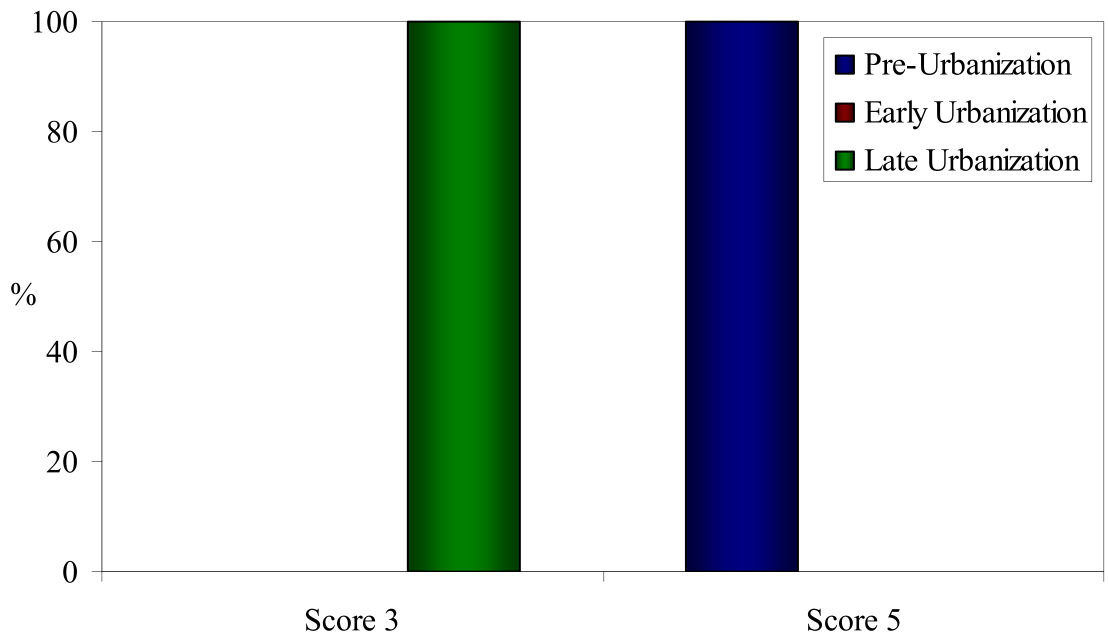

Figure 4.54. Percentage of adult males with periostitis of the left fibula by severity

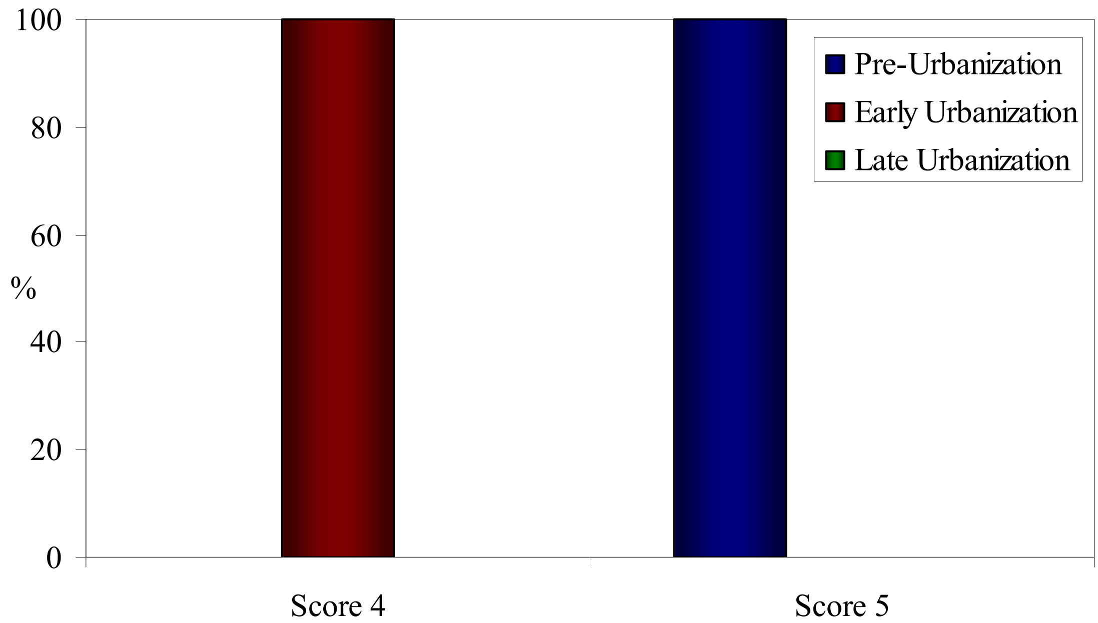

Figure 4.55. Percentage of adult males with periostitis of the right fibula by severity

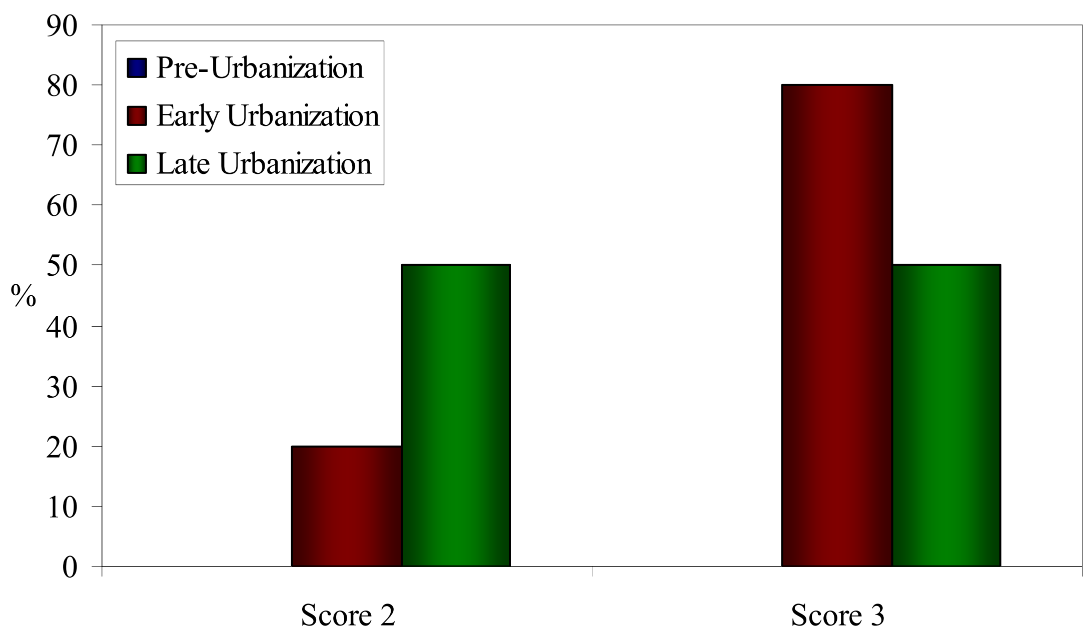

Figure 4.56. Percentage of subadults with periostitis of the left tibia by severity

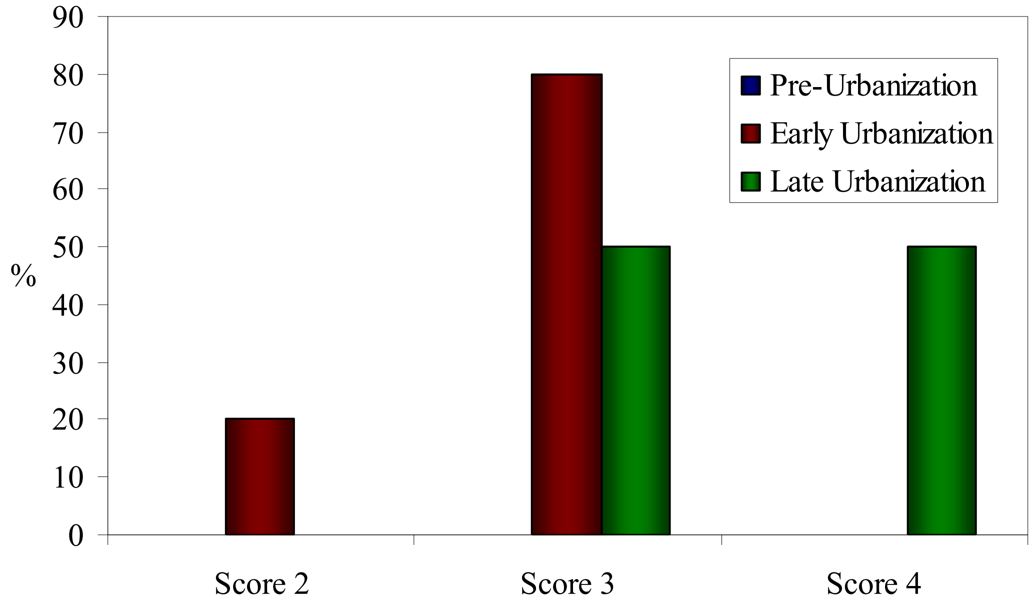

Figure 4.57. Percentage of subadults with periostitis of the right tibia by severity

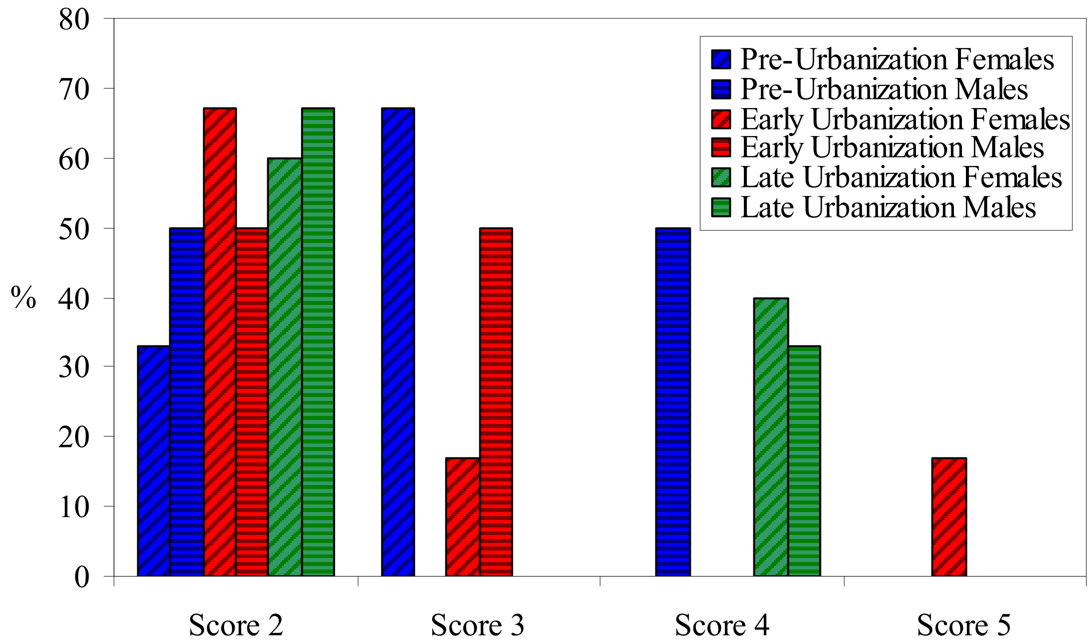

Figure 4.58. Sex-based comparison of percentages of adult males and females with periostitis of the left tibia by severity

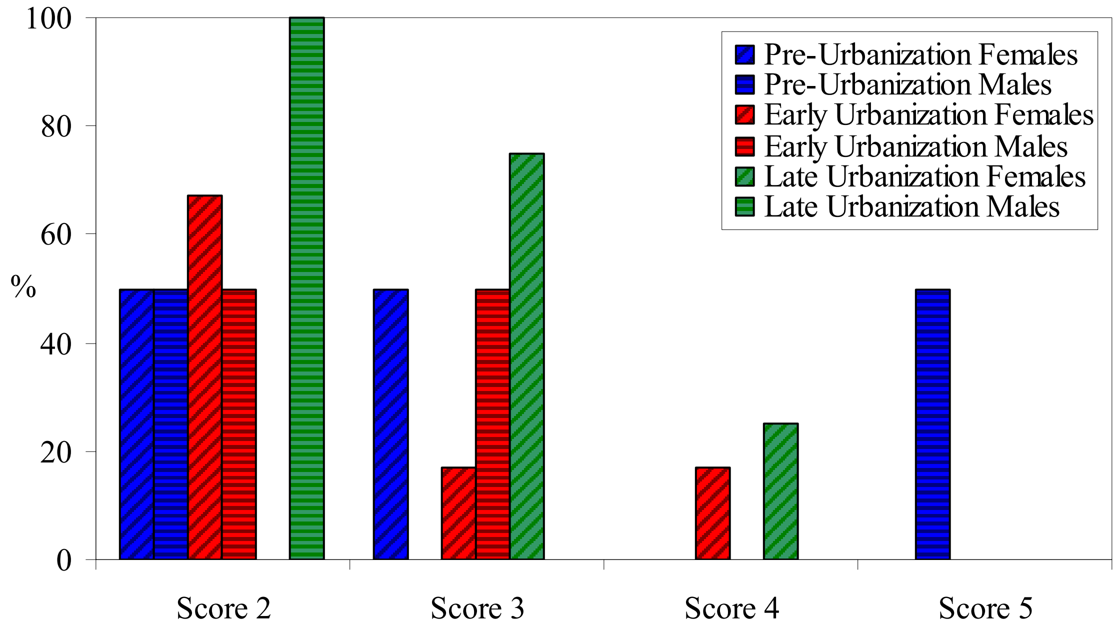

Figure 4.59. Sex-based comparison of percentages of adult males and females with periostitis of the right tibia by severity

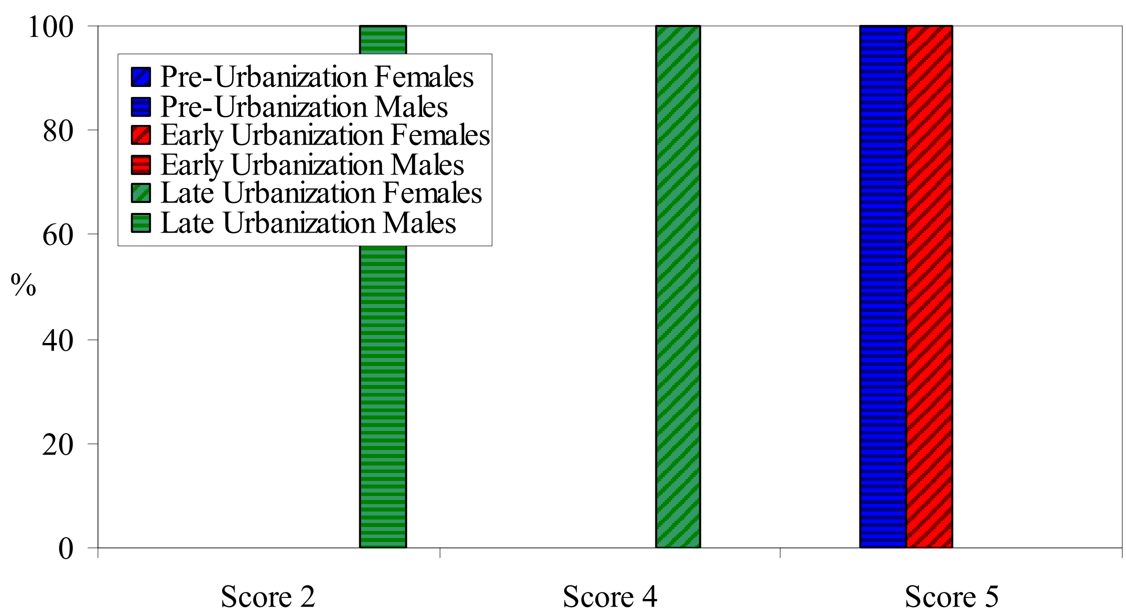

Figure 4.60. Sex-based comparison of percentages of adult males and females with periostitis of the left fibula by severity

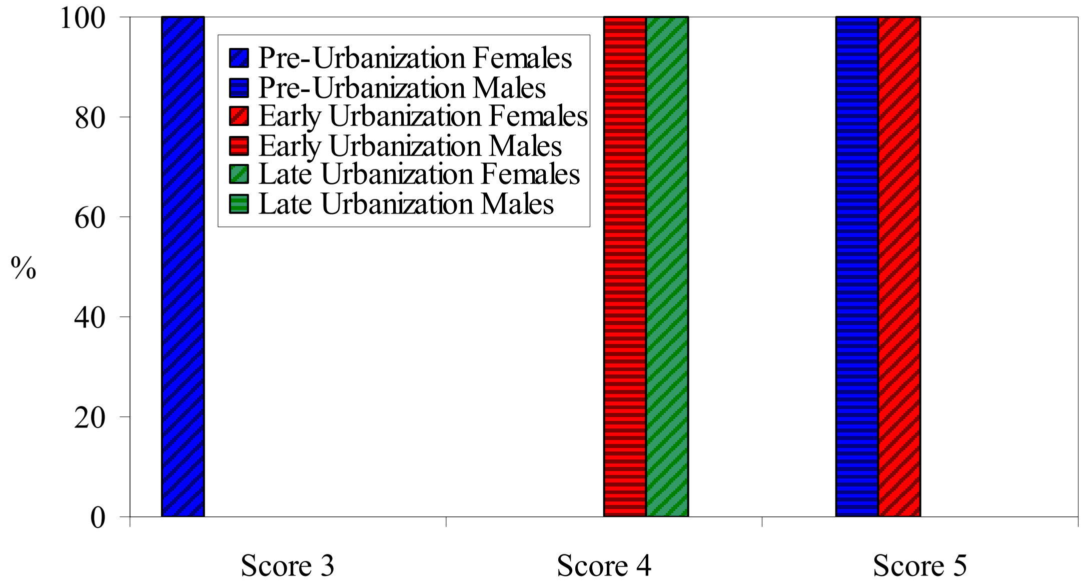

Figure 4.61. Sex-based comparison of percentages of adult males and females with periostitis of the right fibula by severity

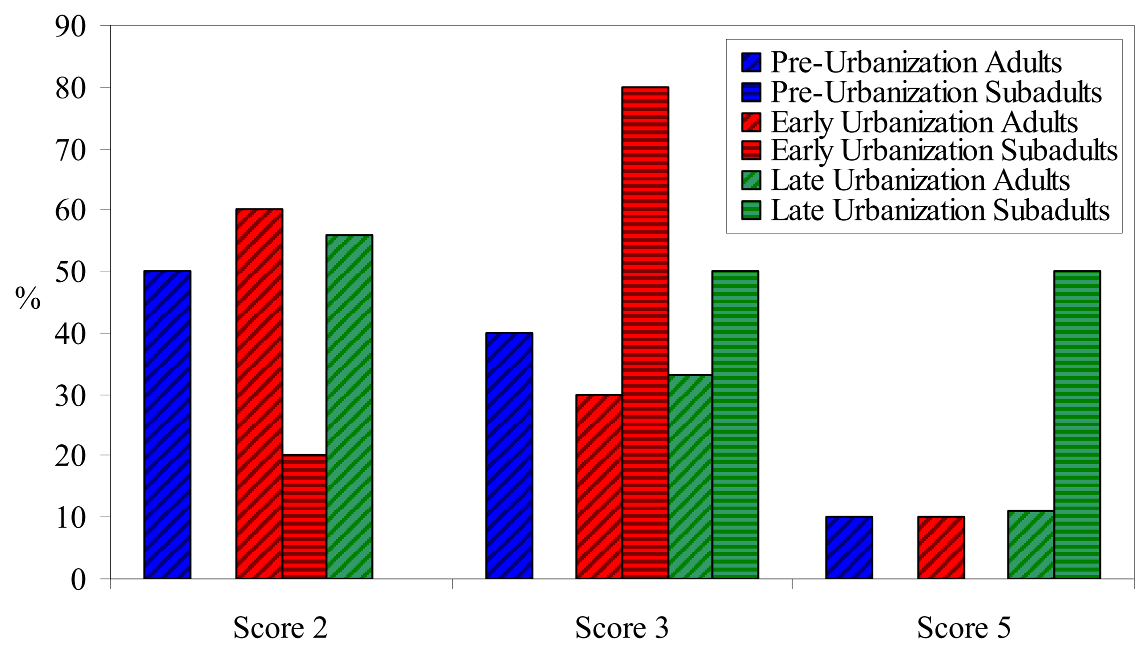

Figure 4.62. Age-based comparison of percentages of adults and subadults with periostitis of the right tibia by severity

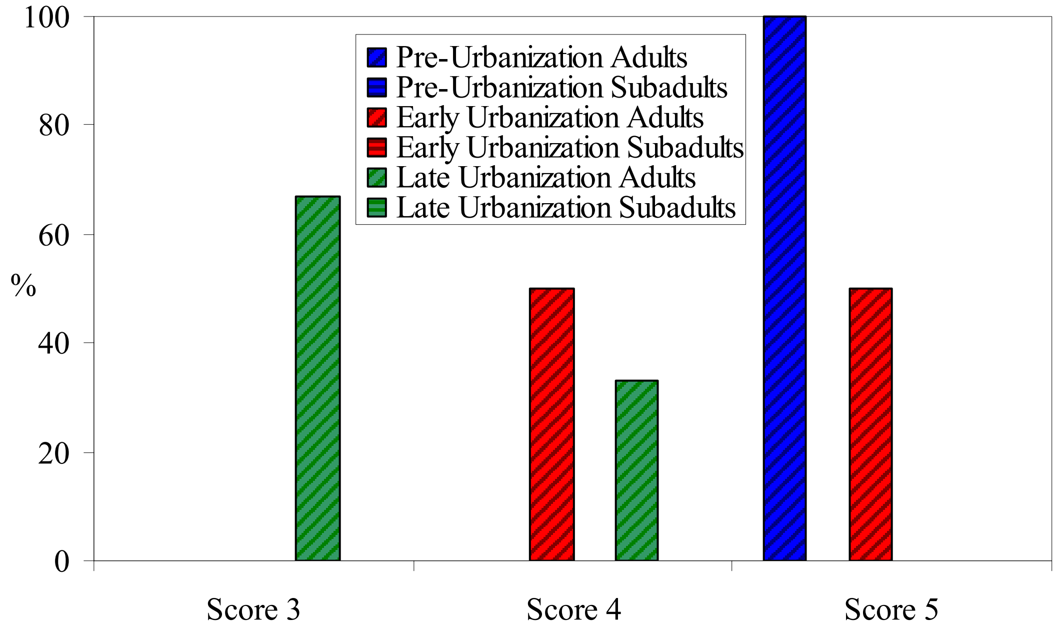

Figure 4.63. Age-based comparison of percentages of adults and subadults with periostitis of the left fibula by severity

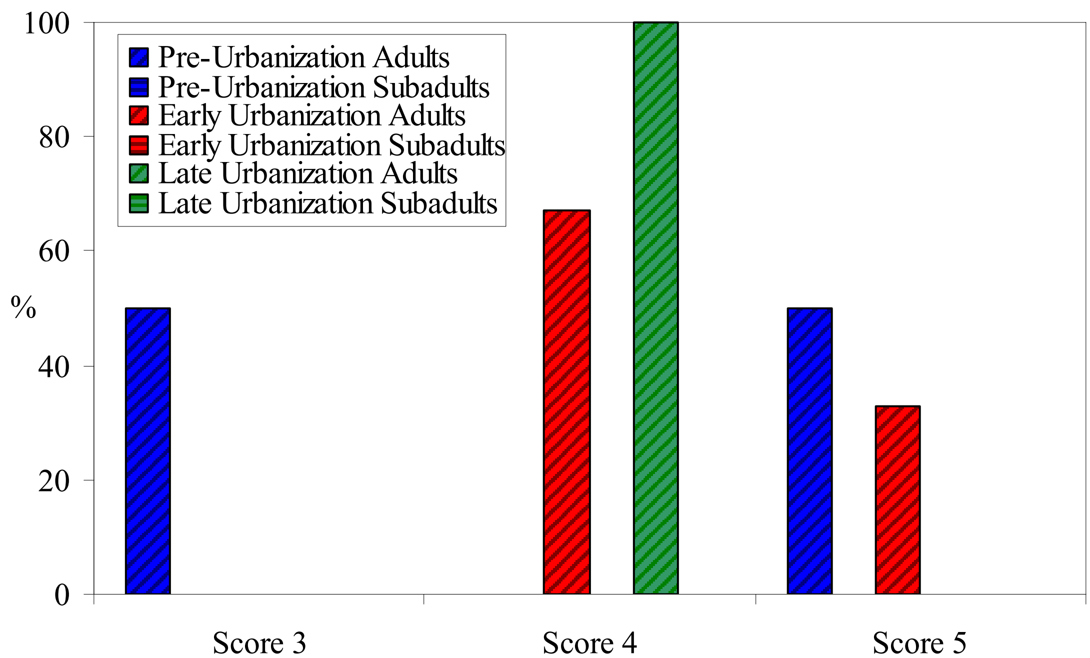

Figure 4.64. Age-based comparison of percentages of adults and subadults with periostitis of the right fibula by severity

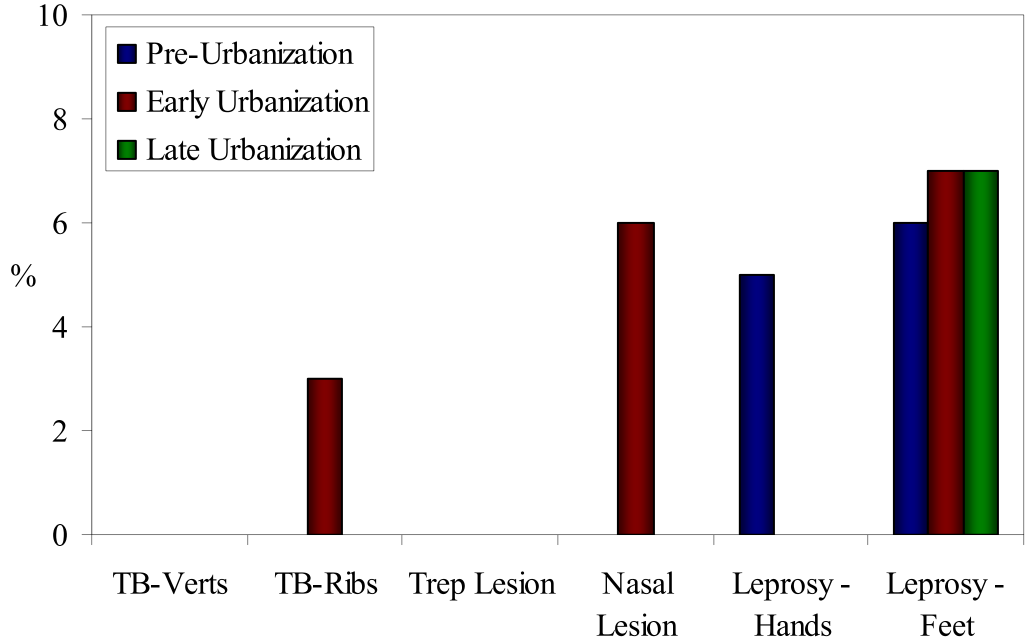

Figure 4.65. Percentage of adults with infectious diseases

may indicate tuberculosis (Figures 4.66, 4.62). However, these lesions may be attributable to any number of chronic respiratory conditions in addition to tuberculosis; therefore, no differential diagnosis can be made (Kelley and Micozzi, 1984). No adults show evidence of tuberculosis on the vertebrae. Cranial lesions of treponematosis (caries sicca) are also absent in the adults. Additionally, while there are periosteal reactions on the tibiae, none of them have the saber-shin deformity that is commonly found in individuals with treponemal disease. There is evidence of leprosy in the adults, as one individual has naso-pharyngeal lesions, including significant remodeling of the nasal aperture margins and loss of the anterior nasal spine (Figure 4.68). Furthermore, several individuals have changes to the hands and feet characteristic of leprosy (Figures 4.69-4.71).

In adult females, there are also no significant trends in the prevalence of indicators of specific infectious diseases among the temporal samples (Figure 4.72; Table B.90). Females have no evidence for tuberculosis or treponematosis in any temporal sample. One female has nasopharyngeal lesions characteristic of leprosy, and two females have changes to the feet consistent with a diagnosis of leprosy. Similarly, temporal comparisons of prevalence of infectious diseases in adult males reveal no significant results (Figure 4.73, Table B.91). One male has lesions on the rib that may be due to tuberculosis, but no evidence of vertebral changes consistent with this disease. In addition, males do not express any evidence of treponematosis. Although no males have the nasopharyngeal lesions of leprosy, three individuals have leprotic changes to the hands and feet. In contrast to the adults, subadults do not express any indicators of specific infectious diseases. Sex-based comparisons of the prevalence of infectious

Figure 4.66. Lesions on pleural surface of ribs (Śródka, burial 42)

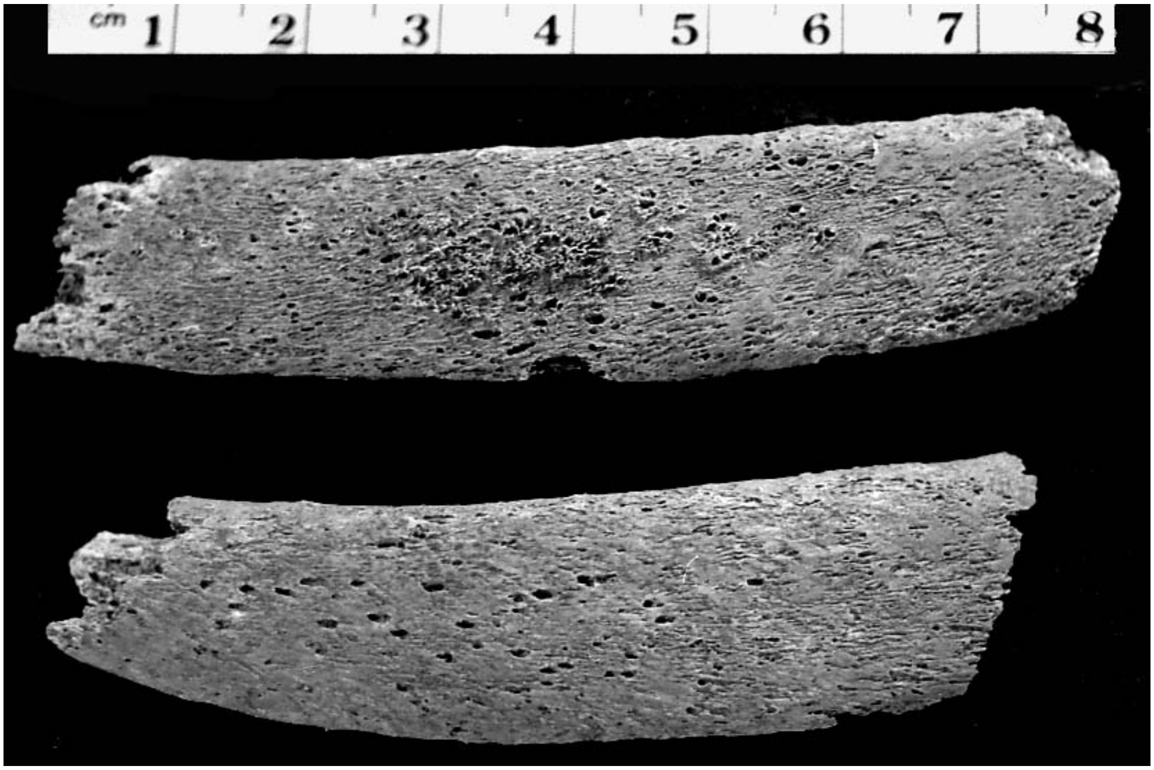

Figure 4.67. Lesions on lateral surface of ribs (Śródka, burial 42)

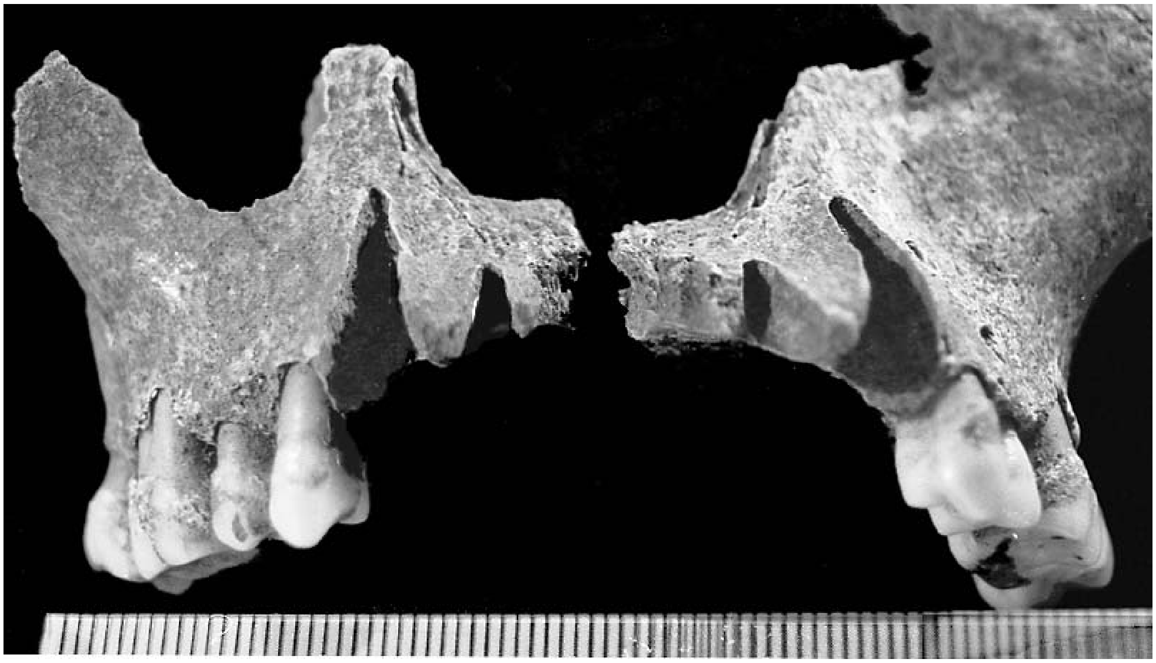

Figure 4.68. Nasopharyngeal lesions (Śródka, burial 33)

Figure 4.69. Resorption of distal aspect of metatarsals (Śródka, burial 111)

Figure 4.70. Resorption of distal aspect of metatarsals (Śródka, burial 40)

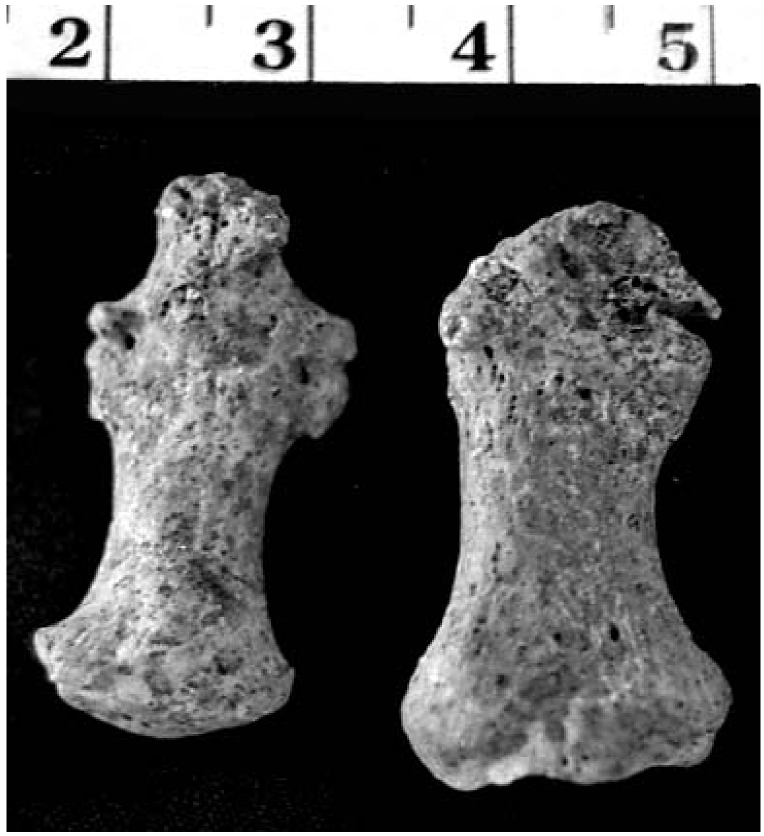

Figure 4.71. Resorption and fusion of distal and middle phalanges of the foot (Śródka , burial 111)

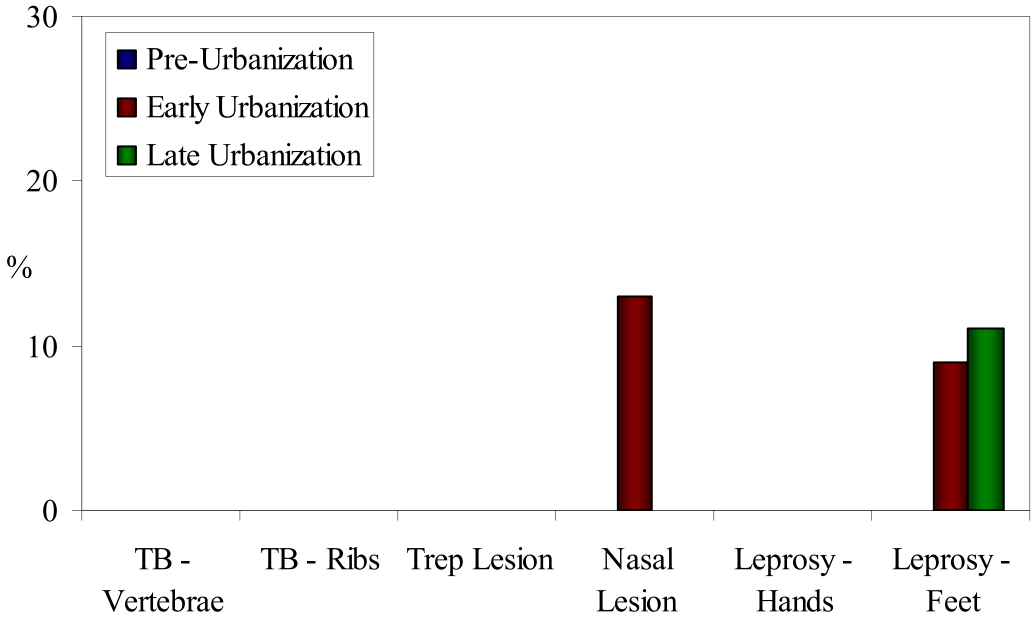

Figure 4.72. Percentage of adult females with infectious diseases

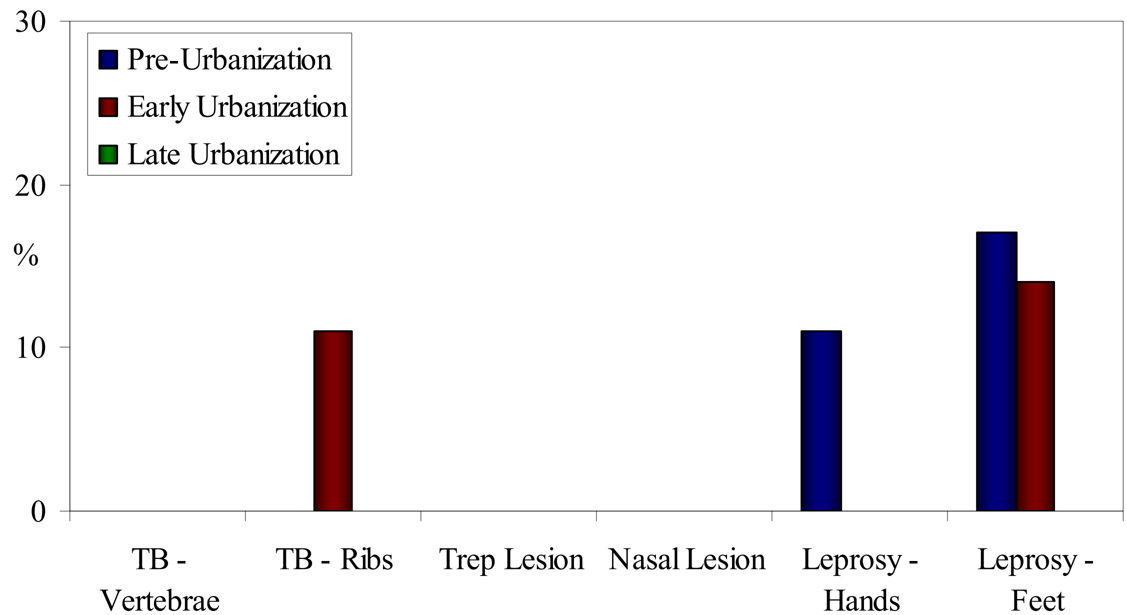

Figure 4.73. Percentage of adult males with infectious diseases

diseases do not express any significant differences between males and females in any temporal sample (Figure 4.74, Table B.92). Likewise, although no subadults possess markers of these diseases, age-based comparisons reveal no significant differences between adults and subadults in any sample (Figure 4.75, Table B.93).

Skeletal Indicators of Health: Diet

Dental Caries

Temporal comparisons of the prevalence and severity of dental caries reveal a single significant trend. In age-based comparison of prevalence of dental caries by tooth class, adults have significantly more carious lesions in the molars than subadults in the early urbanization sample (Fisher's exact, $p \leq 0.05$) (Figure 4.76, Table B.110). All other temporal comparisons reveal no significant trends. In adults, there is no significant difference in the prevalence of carious lesions among the three temporal groups (Figure 4.77, Table B.94). In addition, there were no differences in tooth class affected (incisor, canine, premolar, or molar) (Figure 4.78, Table B.95). In general, the molars were most often affected with carious lesions, while incisors were the least affected. Of those adults with carious lesions, there was also no significant difference in tooth surface affected (occlusal, mesial, distal, buccal, lingual, or cervical) (Figure 4.79, Table B.96). The occlusal surface was most often involved, while lingual and buccal surfaces were least often affected. Similarly, adult females show no significant differences in the prevalence of carious lesions among the three temporal samples (Figure 4.80, Table B.97). Adult females also do not show any significant temporal differences in prevalence of carious lesions by tooth class, although the molar is most often affected (Figure 4.81, Table

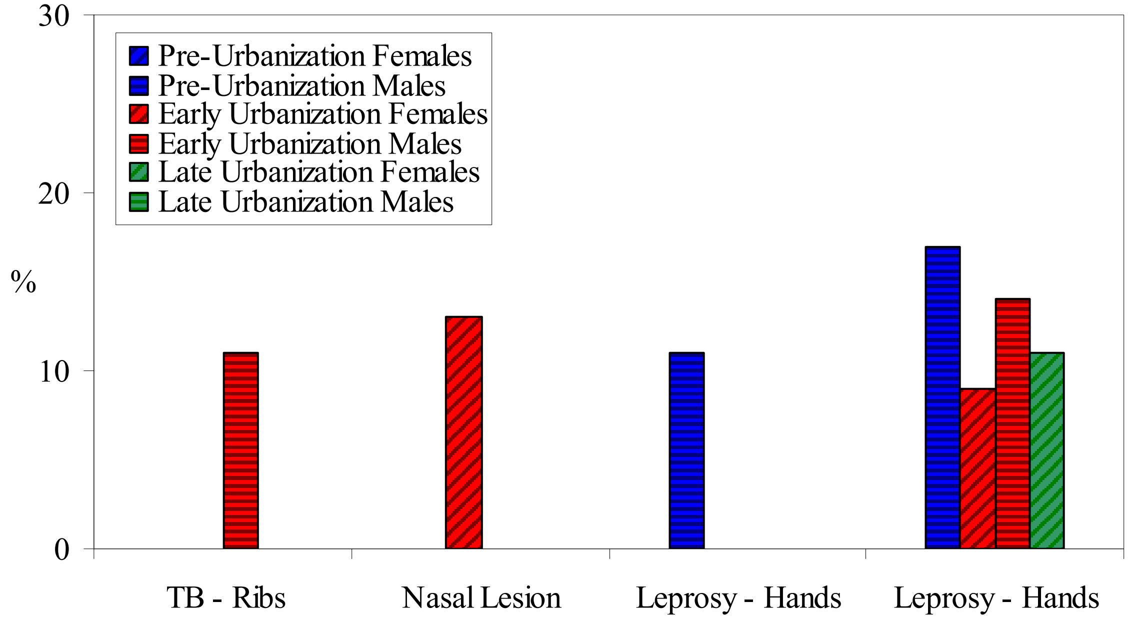

Figure 4.74. Sex-based comparison of percentages of adult males and females with infectious diseases

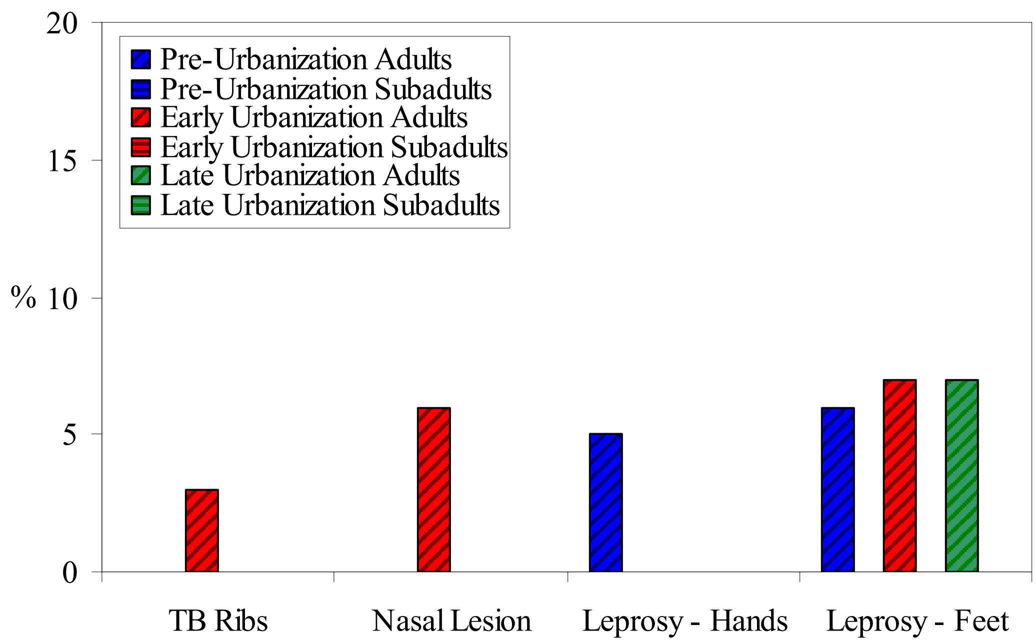

Figure 4.75. Age-based comparison of percentages of adults and subadults with infectious diseases

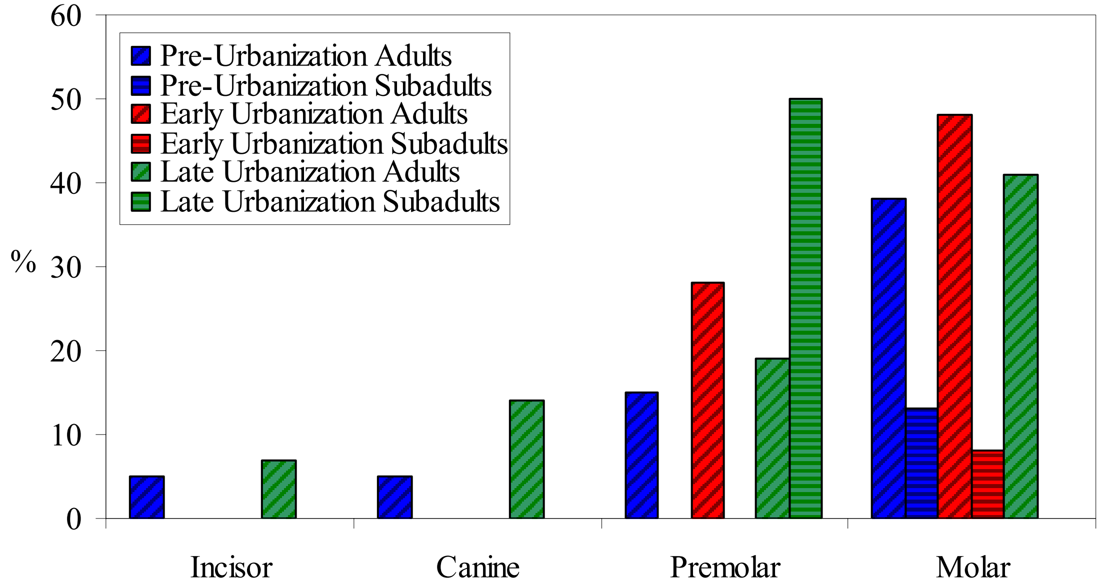

Figure 4.76. Age-based comparison of percentages of adults and subadults with carious lesions by tooth class

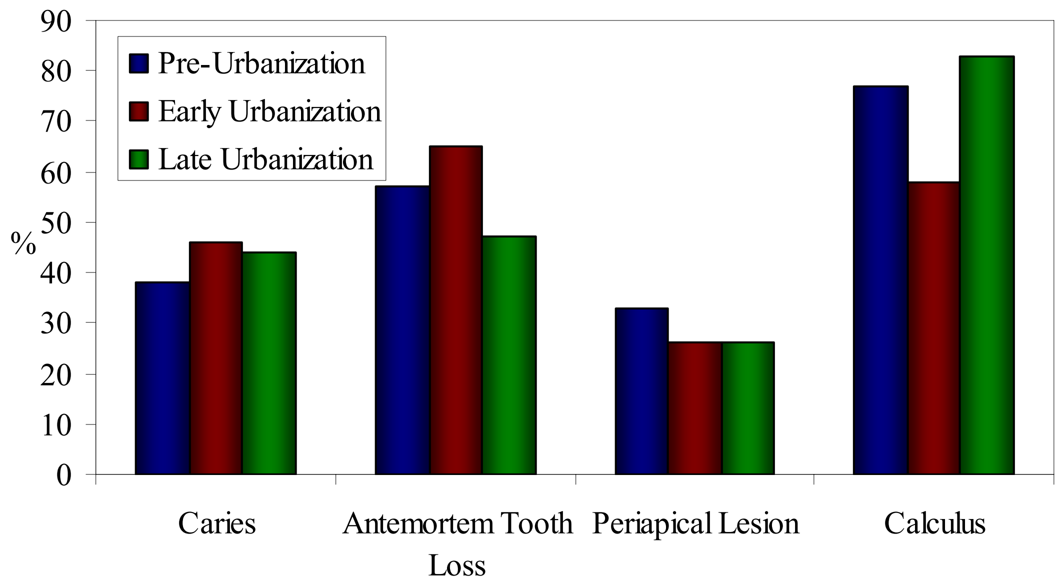

Figure 4.77. Percentages of adults with dental pathological conditions

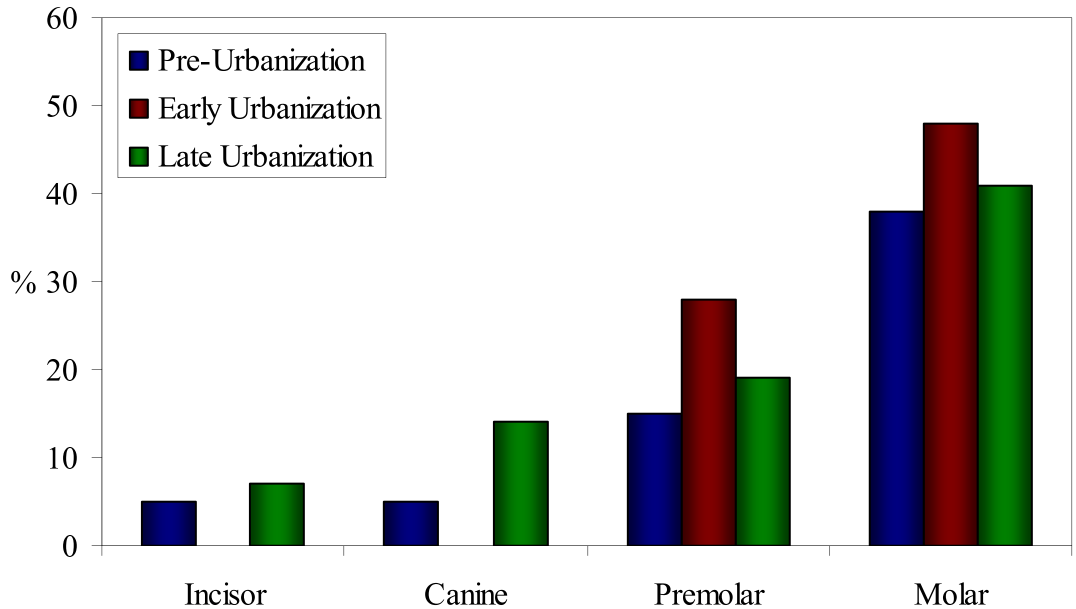

Figure 4.78. Percentage of adults with carious lesions by tooth class

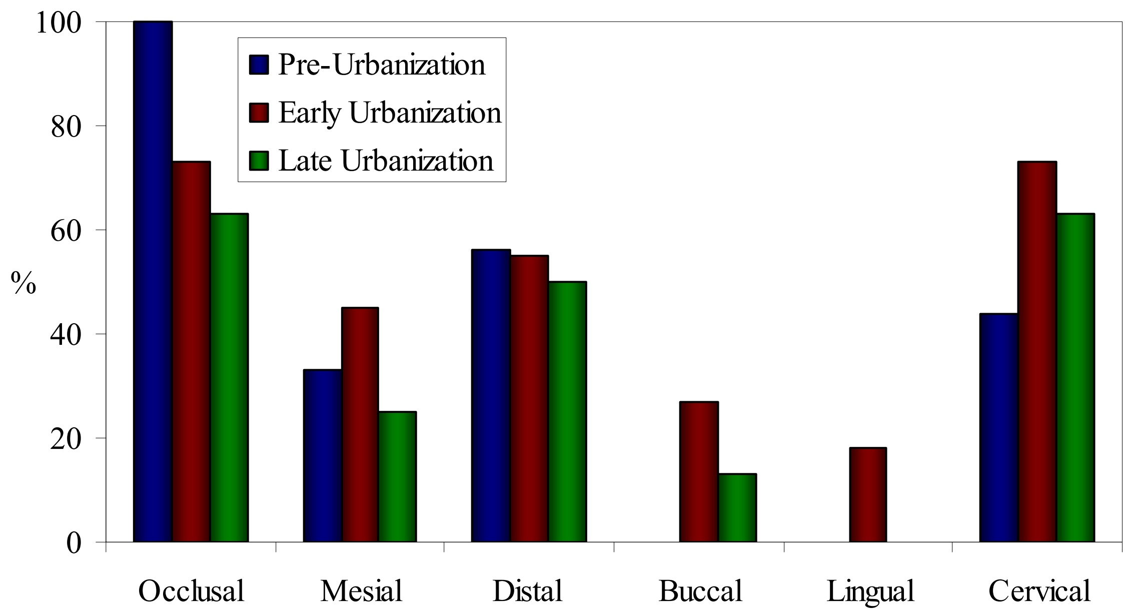

Figure 4.79. Percentage of adults with carious lesions by tooth surface

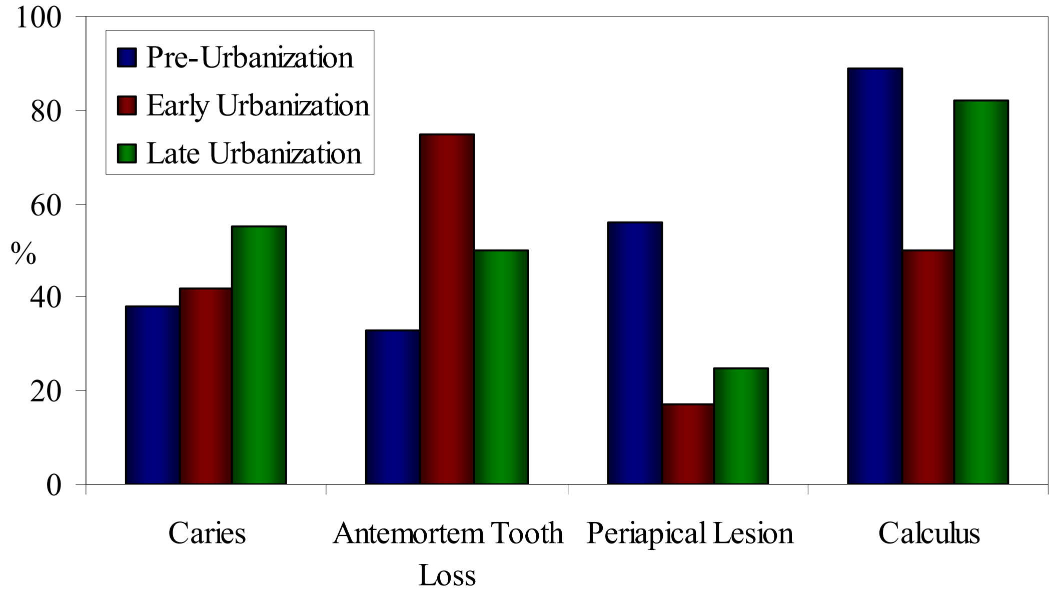

Figure 4.80. Percentages of adult females with dental pathological conditions

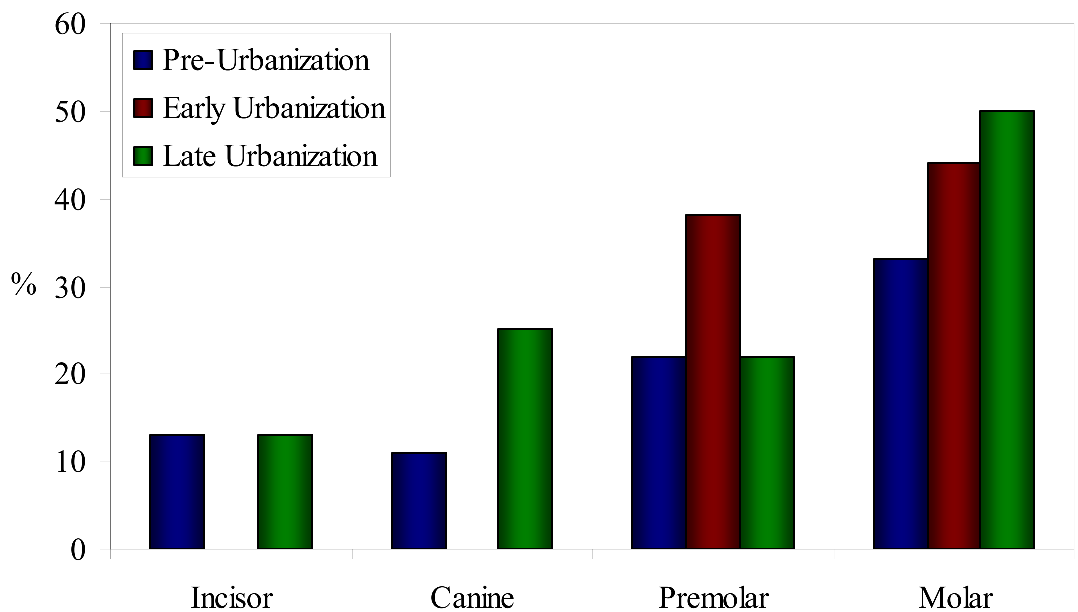

Figure 4.81. Percentage of adult females with carious lesions by tooth class

B.98). Of those adult females with carious lesions, temporal comparisons of tooth surface affected reveal no significant trends (Figure 4.82, Table B.99). The occlusal and cervical surfaces were most often affected, while the buccal and lingual surfaces were least affected.

Adult males exhibit similar results to adult females. Temporal comparisons of the prevalence of carious lesions and the prevalence of lesions by tooth class do not reveal any significant trends (Figures 4.83, 4.84, Tables B.100, B.101). The molars are most often involved, and males show no lesions on the incisors or canines. Among the adult males with caries, there is no significant difference in the tooth surface affected (Figure 4.85, Table B.102). Again, the occlusal surface is most often affected, while the lingual surface is never involved. Subadults have few carious lesions overall. Only one subadult in each temporal period has a carious lesion, resulting in no significant temporal trend (Figure 4.86, Table B.103). Likewise, there is no significant temporal trend in the prevalence of caries by tooth class (Figure 4.87, Table B.104). Of the three individuals with dental caries, there is no temporal difference in the tooth surface affected (Figure 4.88, Table B.105).

Sex-based comparisons of the prevalence of dental caries reveal no significant differences (Figure 4.89, Table B.106). In addition, comparisons of the prevalence of caries by tooth class also lack any significant differences (Figure 4.90, Table B.107). Of those males and females with carious lesions, there are no sex-based differences in tooth surface affected in any temporal sample (Figure 4.91, Table B.108). Age-based comparisons of the prevalence of dental caries also reveal no significant differences between adults and subadults (Figure 4.92, Table B.109). In comparing the prevalence of

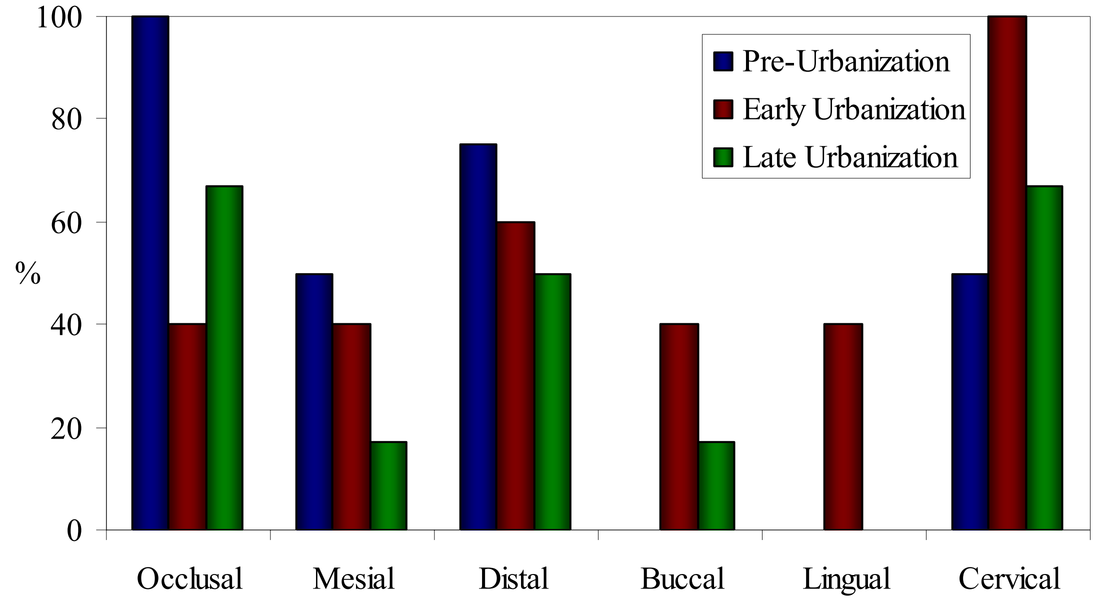

Figure 4.82. Percentage of adult females with carious lesions by tooth surface

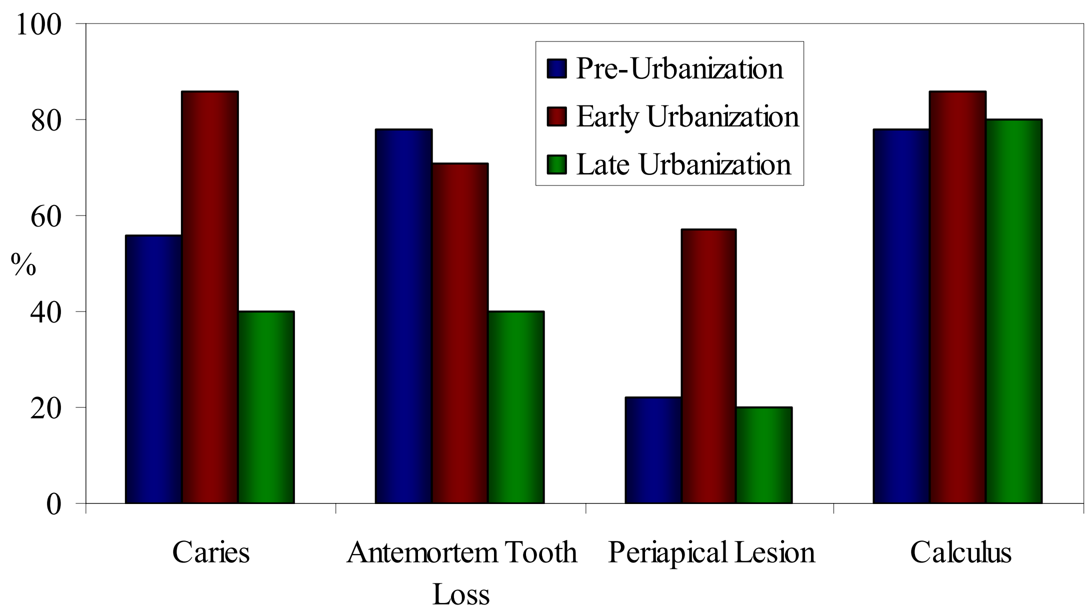

Figure 4.83. Percentages of adult males with dental pathological conditions

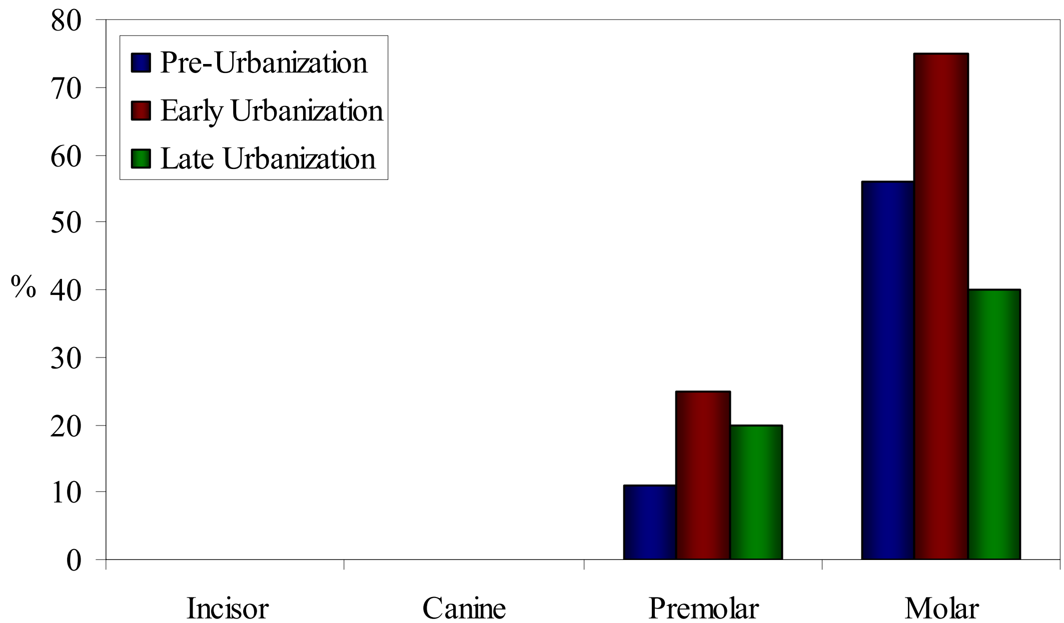

Figure 4.84. Percentage of adult males with carious lesions by tooth class

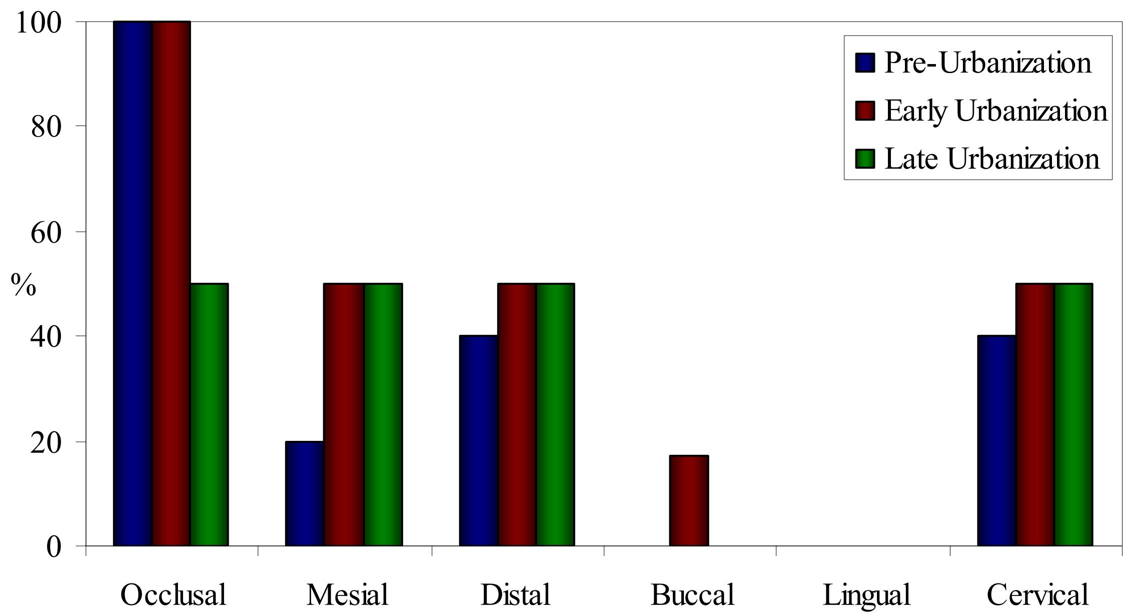

Figure 4.85. Percentage of adult males with carious lesions by tooth surface

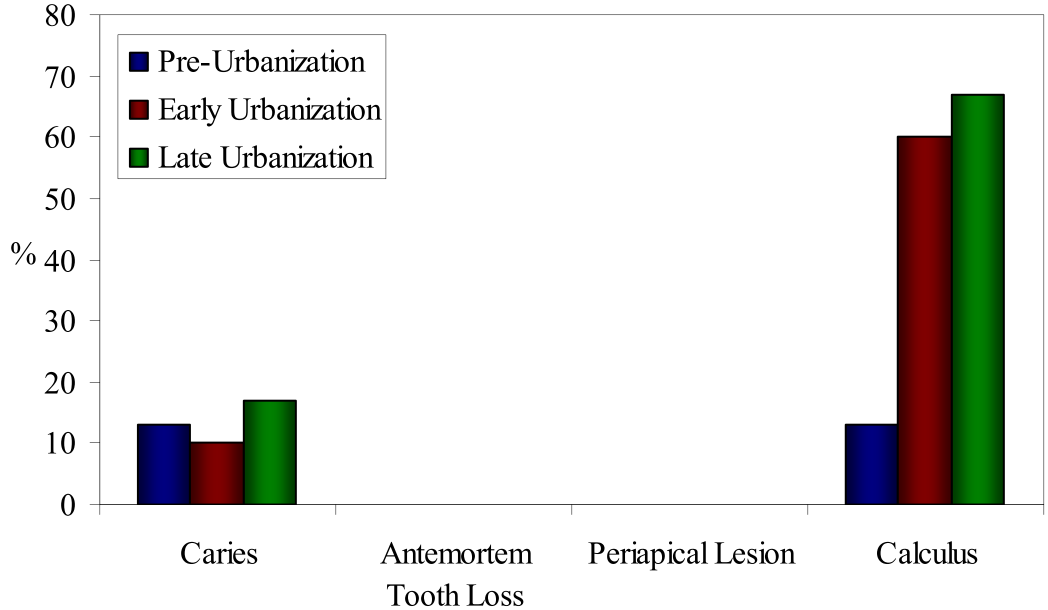

Figure 4.86. Percentages of subadults with dental pathological conditions

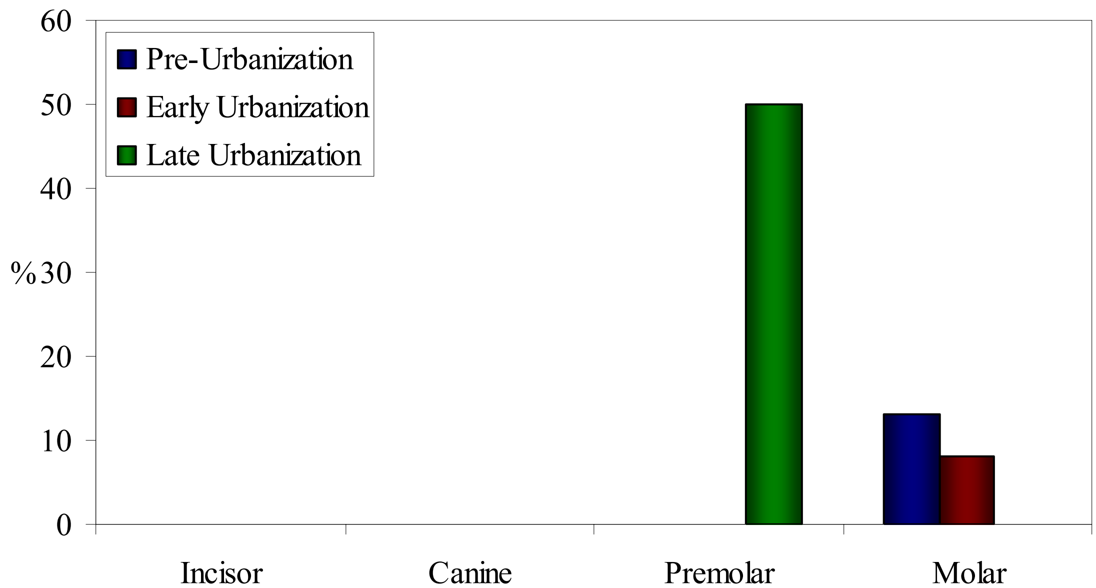

Figure 4.87. Percentage of subadults with carious lesions by tooth class

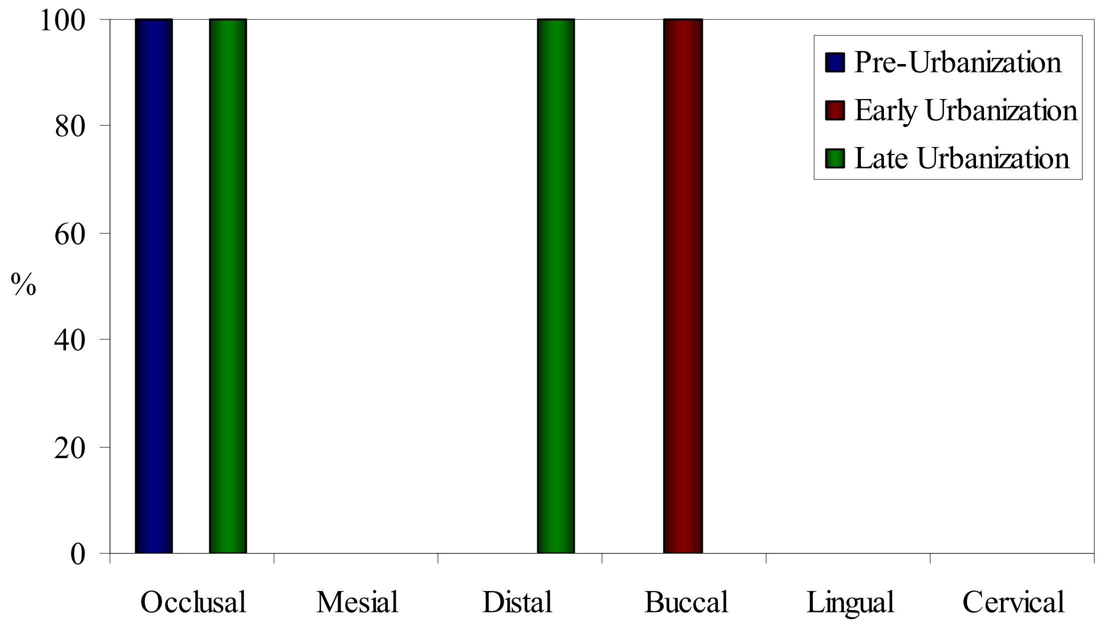

Figure 4.88. Percentage of subadults with carious lesions by tooth surface

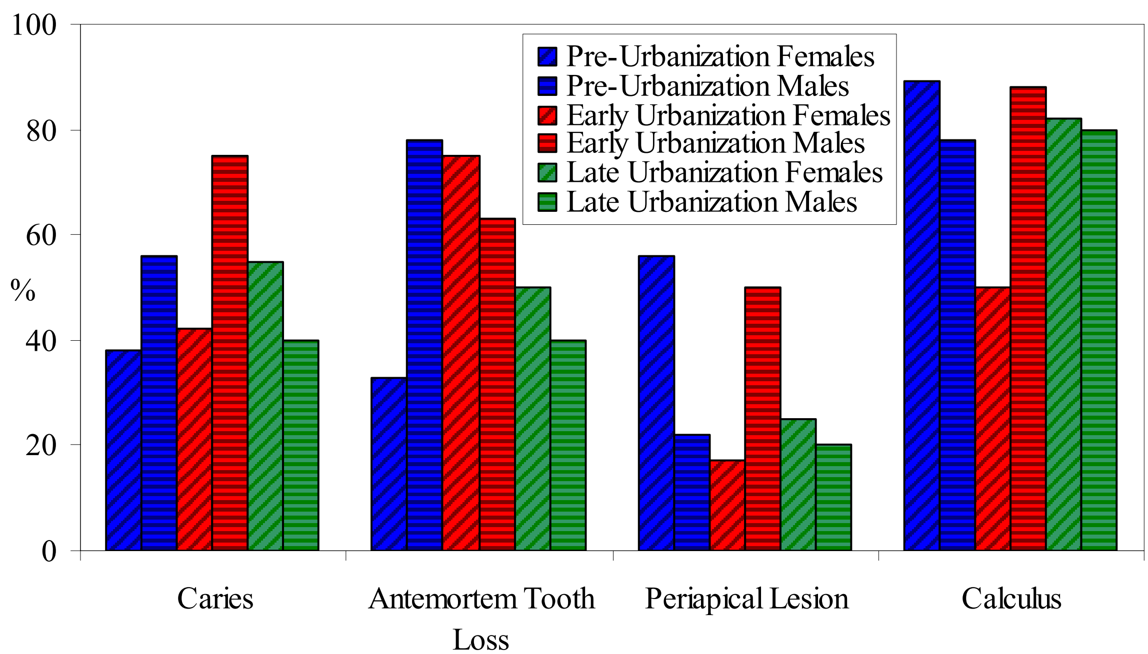

Figure 4.89. Sex-based comparison of percentages of adult males and females with dental pathological conditions

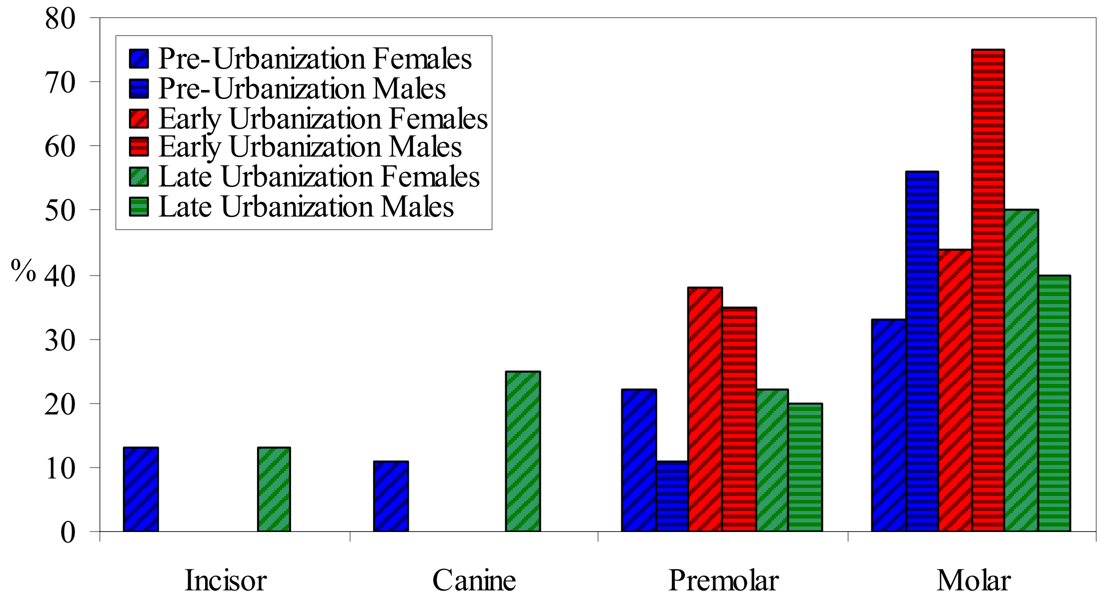

Figure 4.90. Sex-based comparison of percentages of adult males and females with carious lesions by tooth class

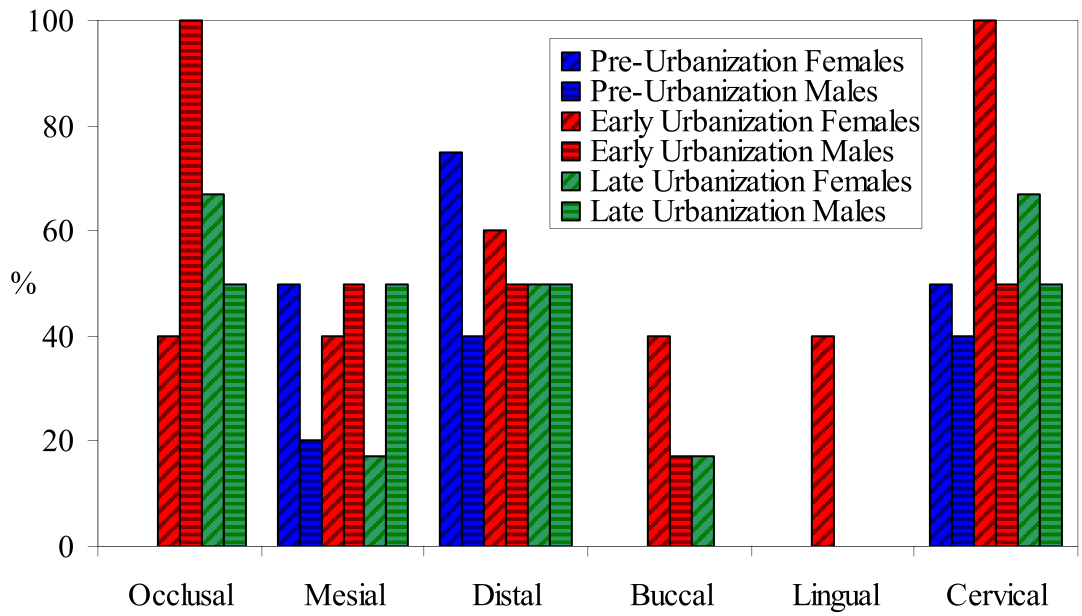

Figure 4.91. Sex-based comparison of percentages of adult males and females with carious lesions by tooth surface

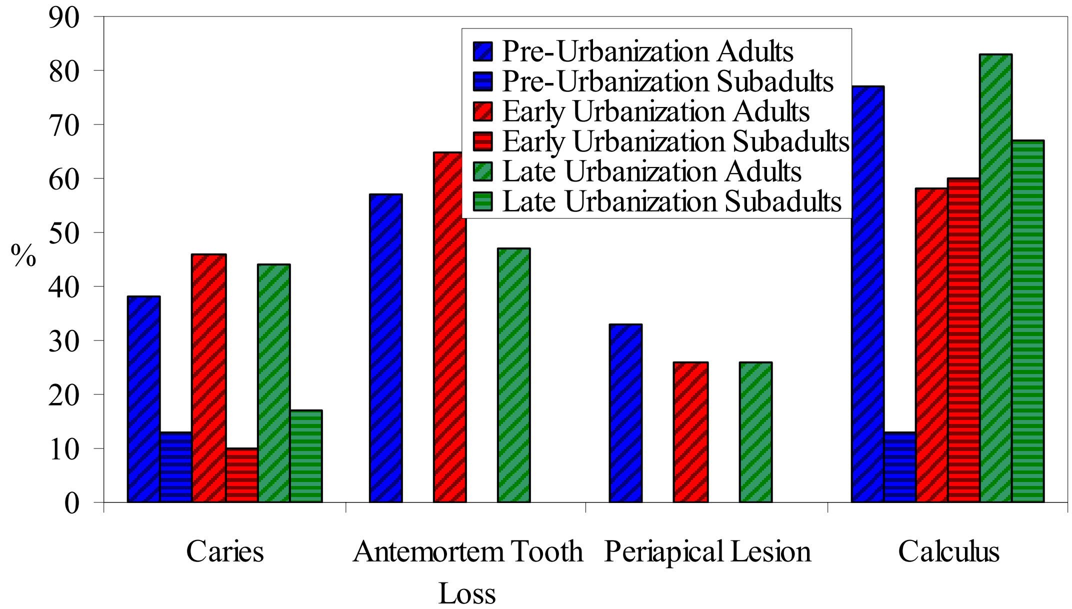

Figure 4.92. Age-based comparison of percentages of adults and subadults with dental pathological conditions

caries by tooth class, there is one significant difference, discussed above; all other comparisons reveal no significant difference between adults and subadults (Figure 4.92, Table B.110). Of those adults and subadults with carious lesions, there is no significant difference in tooth surface affected for each temporal sample (Figure 4.93, Table B.111).

In addition to the prevalence and location of dental caries, temporal comparisons were conducted for severity, in terms of number of carious lesions per individual and size of lesion (small, moderate, large, or pulp exposure). Of adults with dental caries, individuals have between two and five carious lesions; however, temporal comparisons do not reveal any significant trends (Figure 4.94, Table B.112). Likewise, temporal comparisons of lesion size also do not reveal any significant differences among the three samples (Figure 4.95, Table B.113).

Temporal comparisons of the severity of dental caries were conducted in terms of number of carious lesions per individual and size of carious lesion (i.e., small, moderate, large, and pulp exposure). Among adults affected by dental caries, there were no significant trends in the number or the size of lesions (Figures 4.94, 4.95, Tables B.112, B.113). Adults have between one and seven carious lesions; however, there is no difference among the three temporal samples. Adults from the three samples exhibit all sizes of carious lesions; but there is a lack of significant difference in the prevalence of each lesion size. Similarly, adult females with dental caries reveal no significant difference in the number and size of carious lesions among the three temporal samples (Figures 4.96, 4.97, Tables B.114, B.115). Females have between one and six carious lesions, and they possess all lesion sizes in each temporal sample. Adult males also follow this trend, as those with dental caries do not show any significant temporal trend

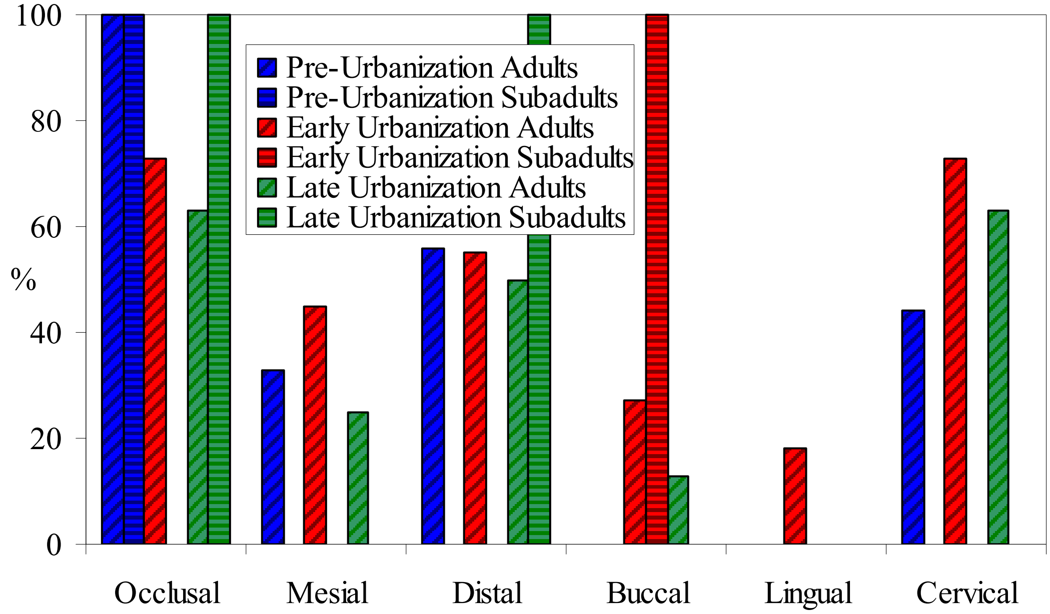

Figure 4.93. Age-based comparison of percentages of adults and subadults with carious lesions by tooth surface

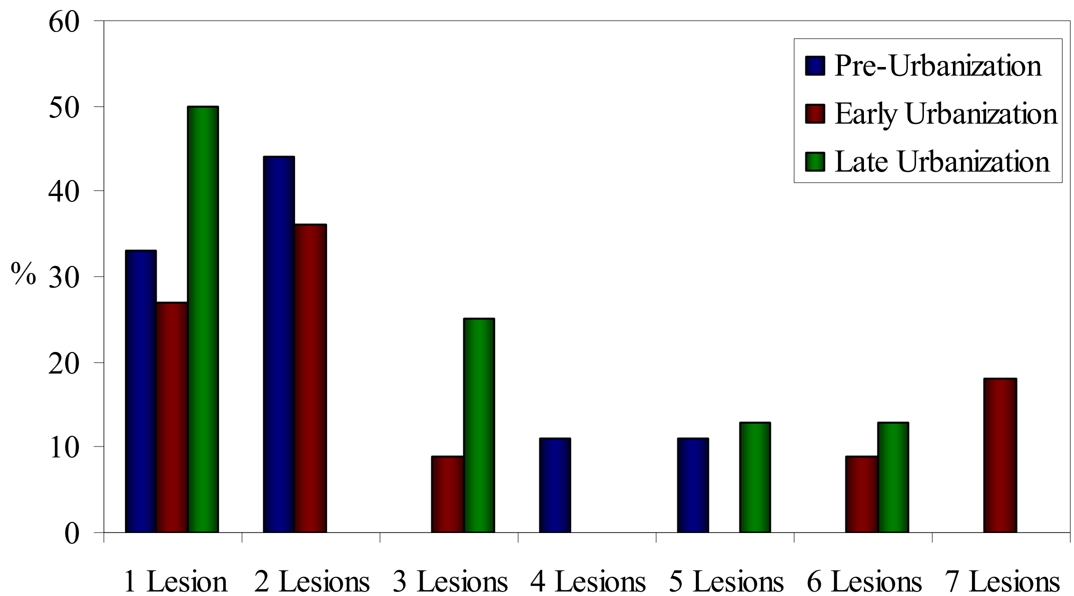

Figure 4.94. Percentage of adults with single and multiple carious lesions

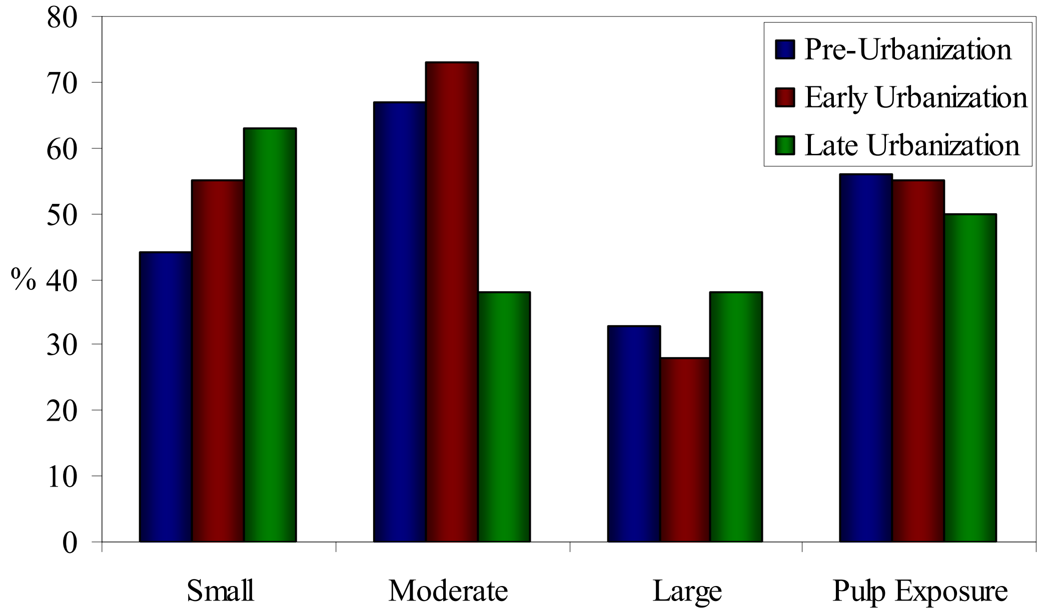

Figure 4.95. Percentage of adults with carious lesions by severity

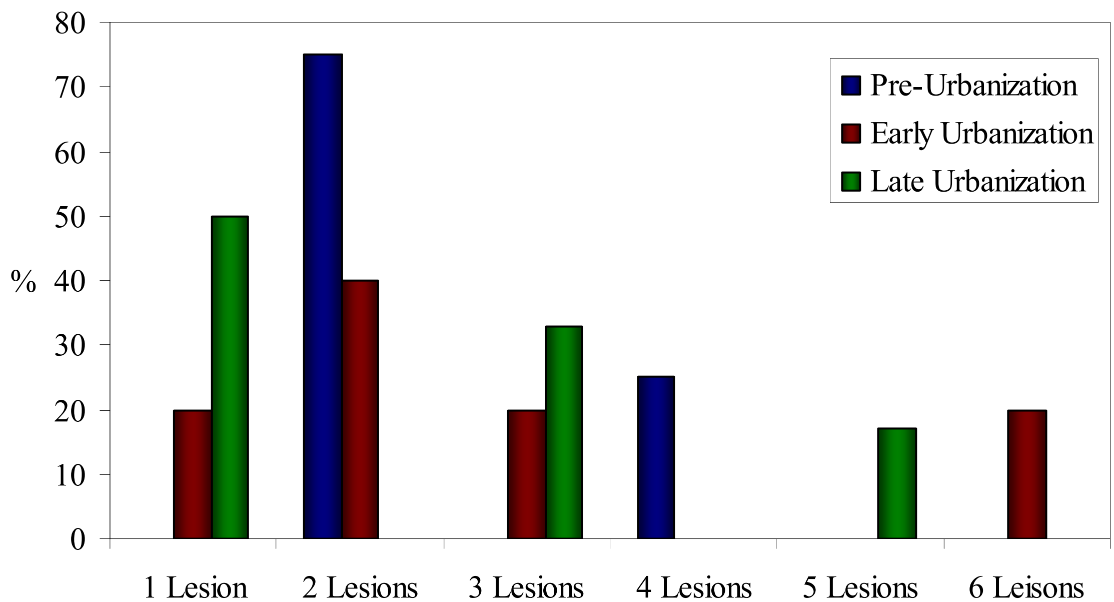

Figure 4.96. Percentage of adult females with single and multiple carious lesions

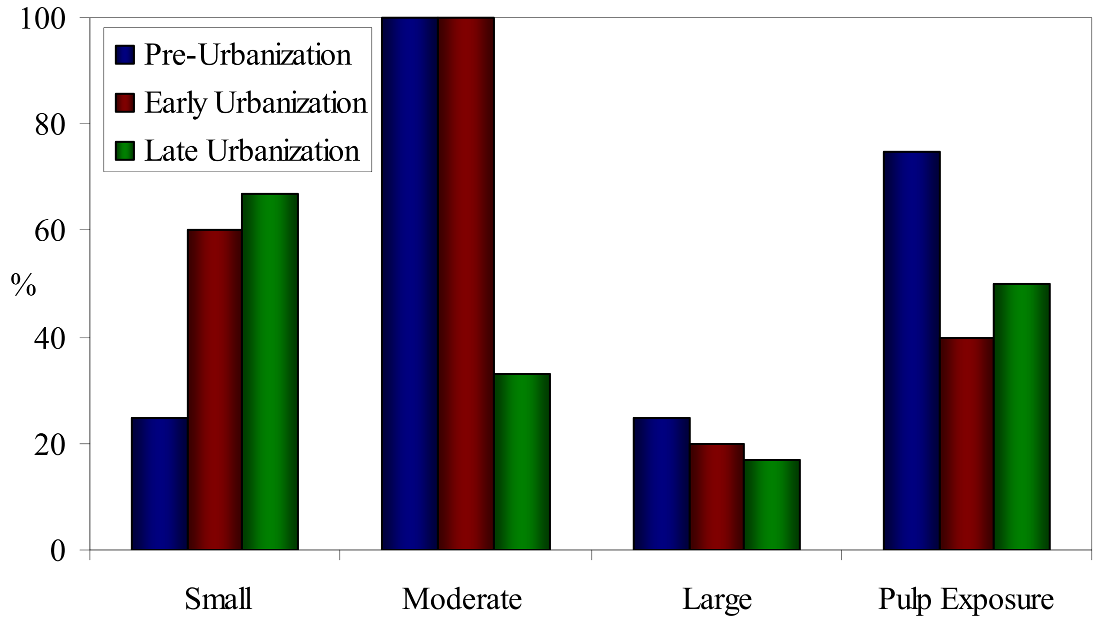

Figure 4.97. Percentage of adult females with carious lesions by severity

in the number and size of carious lesions among the three samples (Figures 4.98, 4.99, Tables B.116, B.117). Males have between one and seven lesions, and, in each sample, all four lesions sizes are present.

All subadults with dental caries only have a single lesion; therefore, there is no significant temporal trend among the three samples (Figure 4.100, Table B.118). No subadults have the largest carious lesion involving pulp exposure. Comparison of the prevalence of the small, moderate, and large lesions among the three temporal samples also reveals no significant differences for subadults (Table B.119). Comparisons of sex differences in the number and the size of carious lesions do not reveal any significant trends in each temporal sample (Figures 4.101, 4.102, Tables B.120, B.121). Comparisons of adults and subadults in the number and size of carious lesions also lack any significant differences in each temporal sample (Figures 4.103, 4.104, Tables B.122, B.123).

Antemortem Tooth Loss

Temporal comparisons of the prevalence of antemortem tooth loss reveal no significant trends in adults, adult females, and adult males (Figures 4.77, 4.80, 4.83; Tables B.94, B.97, B.100). Subadults do not exhibit any antemortem tooth loss in any temporal sample (Figure 4.86, Table B.103). Comparisons of males and females for the prevalence of antemortem tooth loss do not show significant differences in any temporal period (Figure 4.89, Table B.106). Comparisons of adults and subadults, on the other hand, do exhibit two significant differences. In the pre-urbanization sample, adults have significantly more teeth lost antemortem than subadults (Fisher's exact, $p \leq 0.05$) (Figure 4.92, Table B.109). Likewise, in the early urbanization sample, adults have significantly

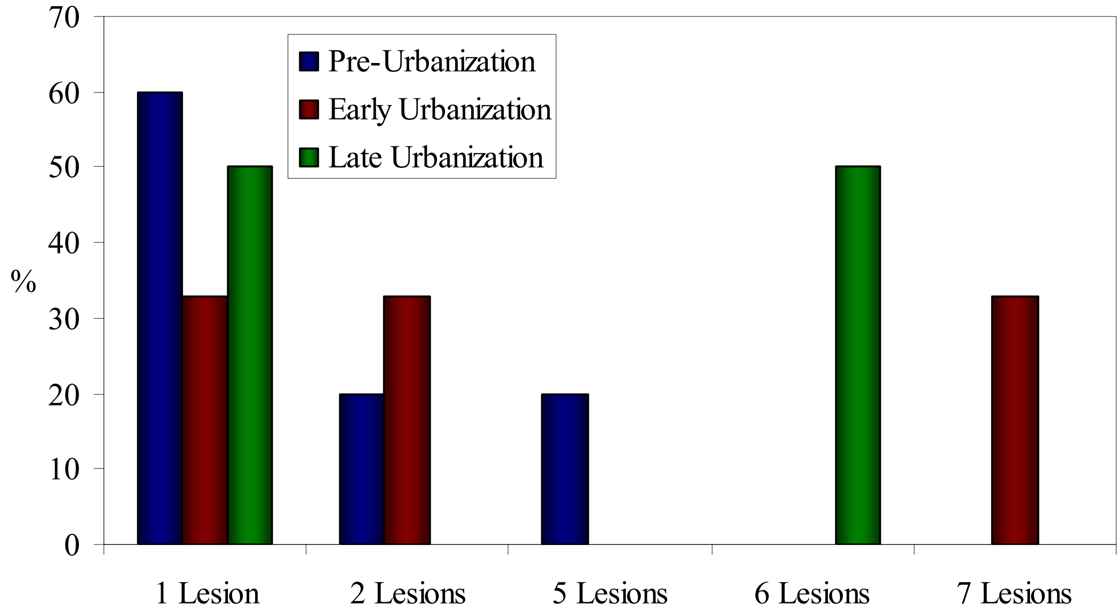

Figure 4.98. Percentage of adult males with single and multiple carious lesions

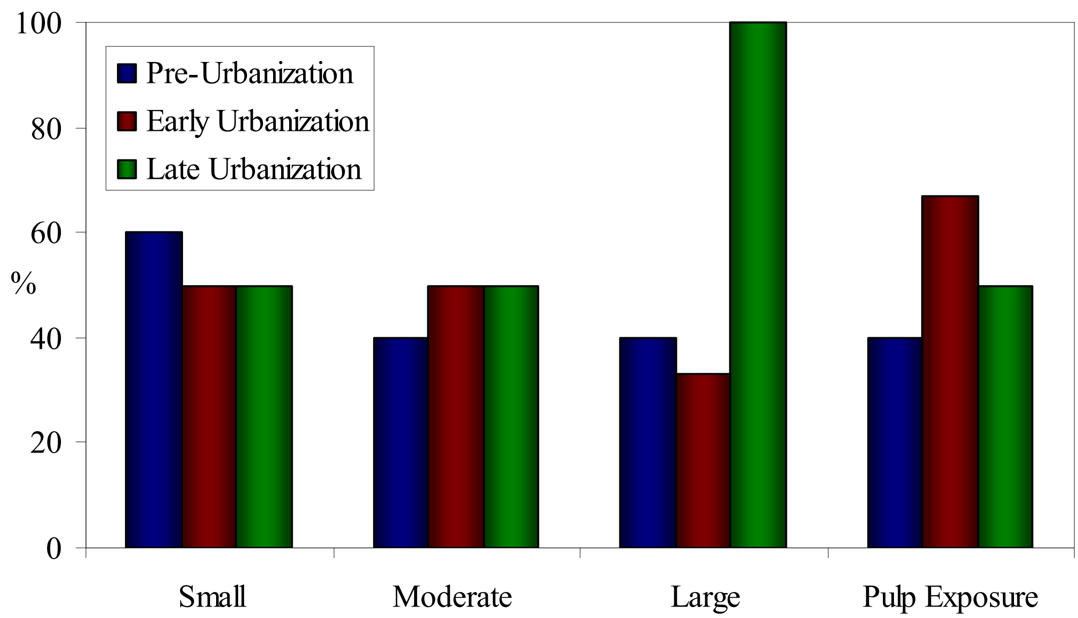

Figure 4.99. Percentage of adult males with carious lesions by severity

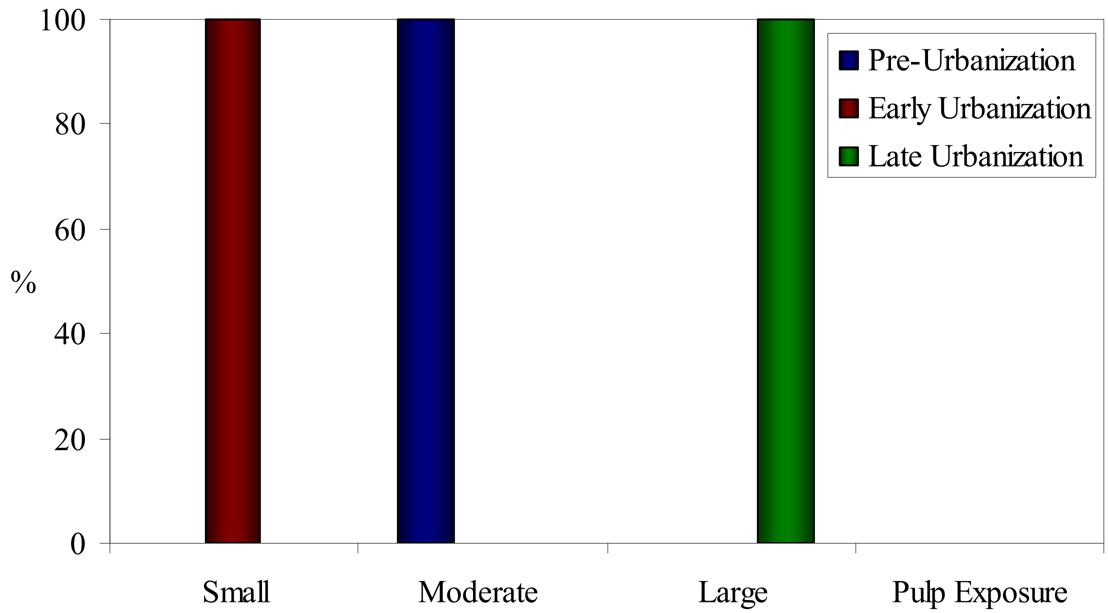

Figure 4.100. Percentage of subadults with carious lesions by severity

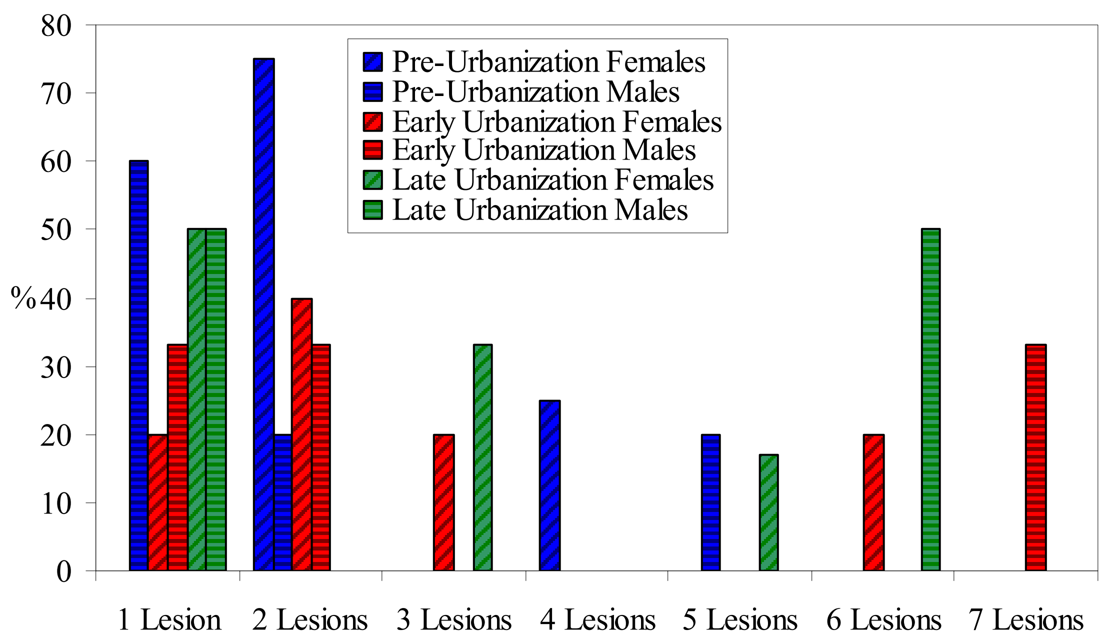

Figure 4.101. Sex-based comparison of percentages of adult males and females with single and multiple carious lesions

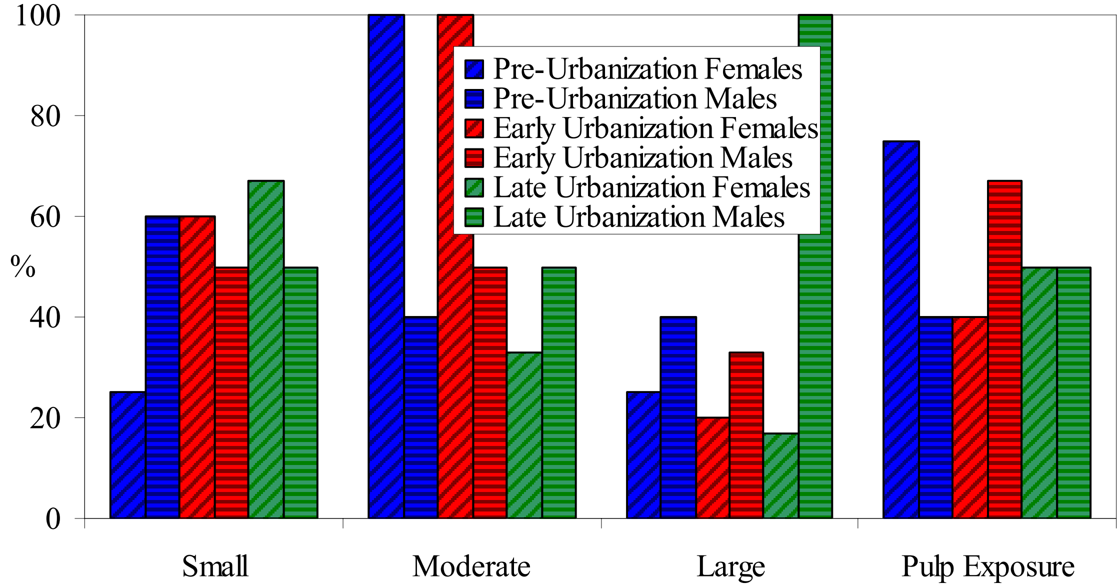

Figure 4.102. Sex-based comparison of percentages of adult males and females with carious lesions by severity

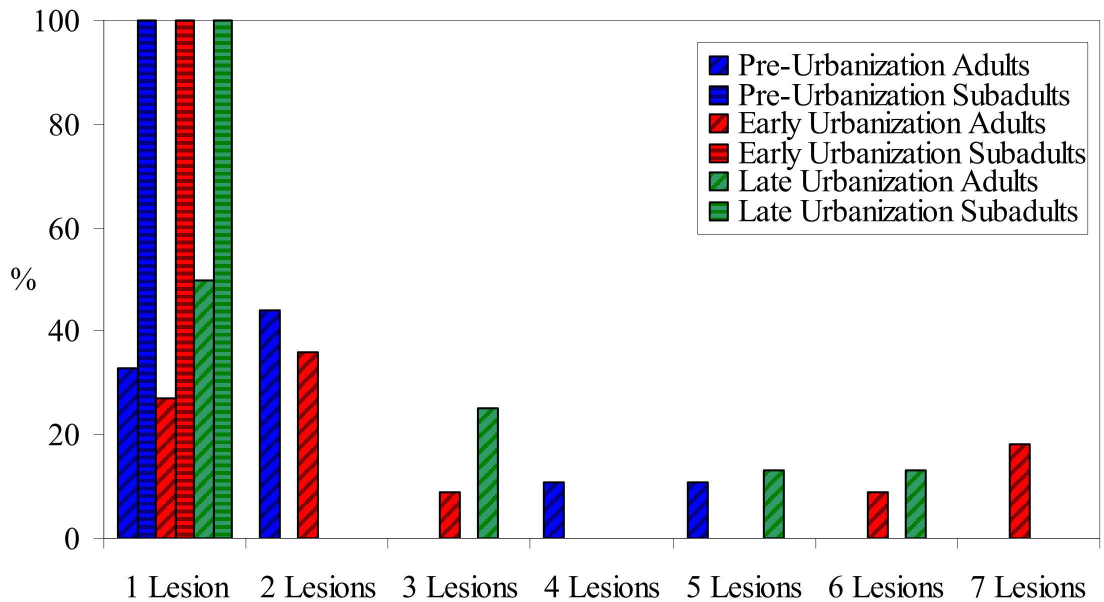

Figure 4.103. Age-based comparison of percentages of adults and subadults with single and multiple carious lesions

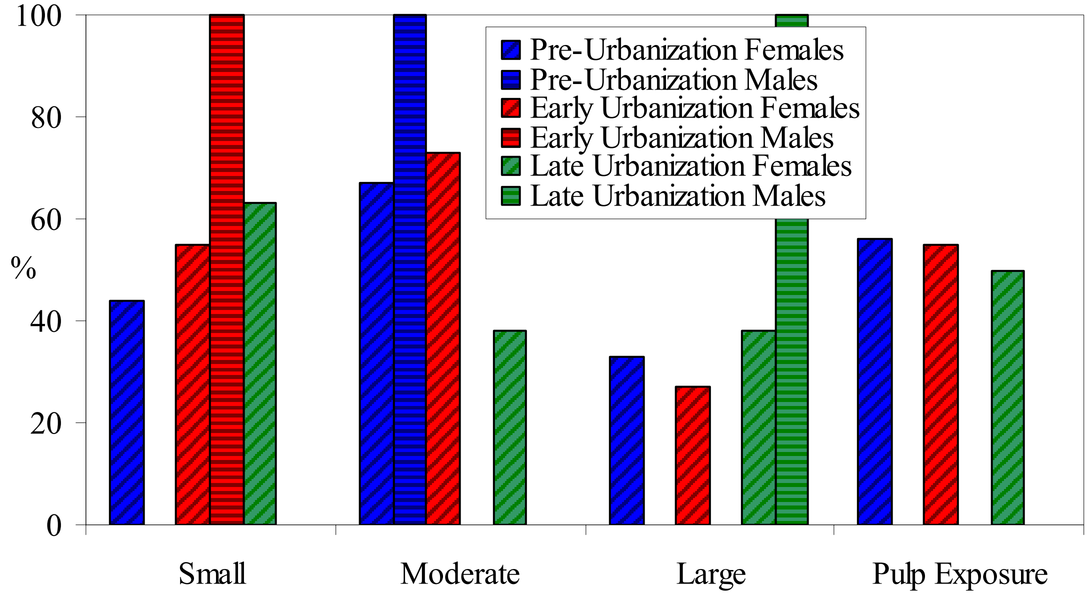

Figure 4.104. Age-based comparison of percentages of adults and subadults with carious lesions by severity

more antemortem tooth loss than subadults (Fisher's exact, $p \leq 0.05$). In the post urbanization sample, there is no significant difference between adults and subadults; however, only the adults exhibit antemortem tooth loss.

Temporal comparisons of the severity of antemortem tooth loss were conducted in terms of number of teeth lost. Among adults with antemortem tooth loss, there is one significant result (Fisher's exact, $p \leq 0.05$) (Figure 4.105, Table B.124). Many adults in the pre-urbanization sample have two teeth lost antemortem, while no adults from the late urbanization sample have two teeth lost. Conversely, among late urbanization adults, a number of them have five teeth lost antemortem, while no pre-urbanization adults exhibit the loss of five teeth antemortem. Overall, adults have between one and 32 teeth lost antemortem. Among adult females, there are no significant temporal trends in the severity of antemortem tooth loss, as females exhibit antemortem tooth loss of between one and 32 teeth (Figure 4.106, Table B.125). Adult males also lack any significant results of the comparison of the severity of antemortem tooth loss (Figure 4.107, Table B.126). Males exhibit only one to six teeth lost antemortem. Since subadults do not have any antemortem tooth loss, no comparisons of severity were carried out. Sex-based comparisons of severity of antemortem tooth loss lack any significant trends for each temporal sample (Figure 4.108, Table B.127). Similarly, age-based comparisons also do not reveal any significant differences in each temporal sample (Figure 4.109, Table B.128).

Periapical Lesions

No significant trends are found in the temporal comparisons of the prevalence of periapical lesions. Comparisons of adults, adult females, and adult males for the presence

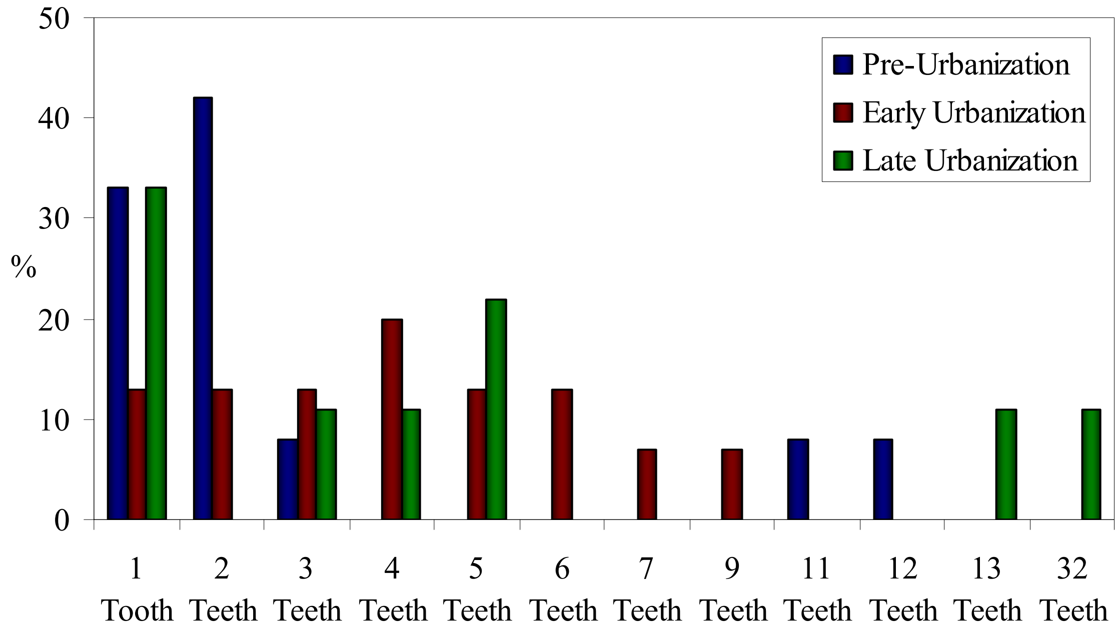

Figure 4.105. Percentage of adults with single and multiple teeth lost antemortem

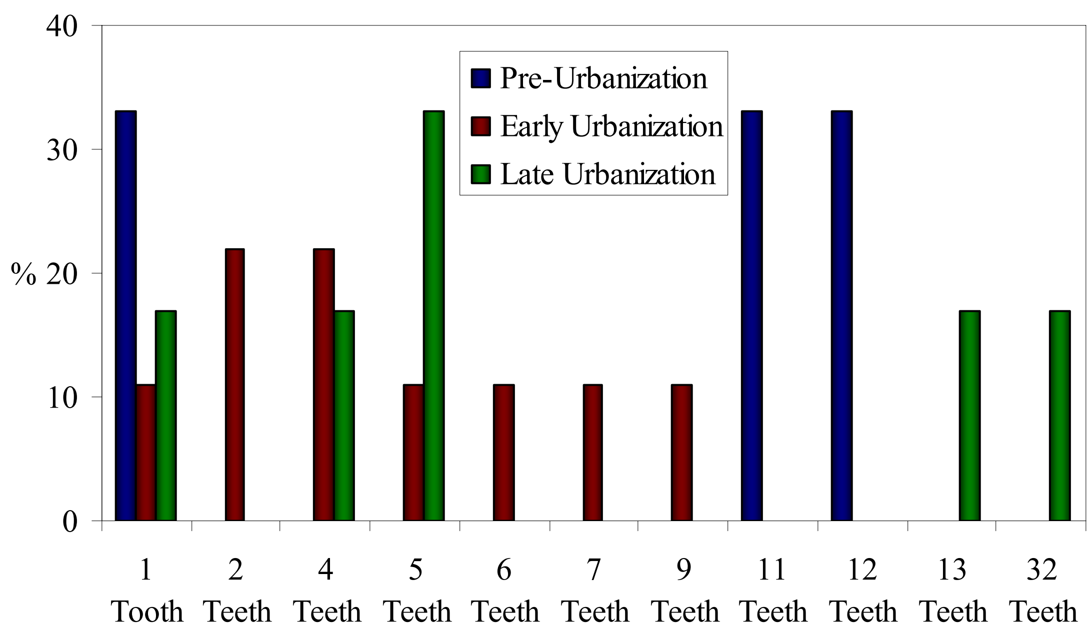

Figure 4.106. Percentage of adult females with single and multiple teeth lost antemortem

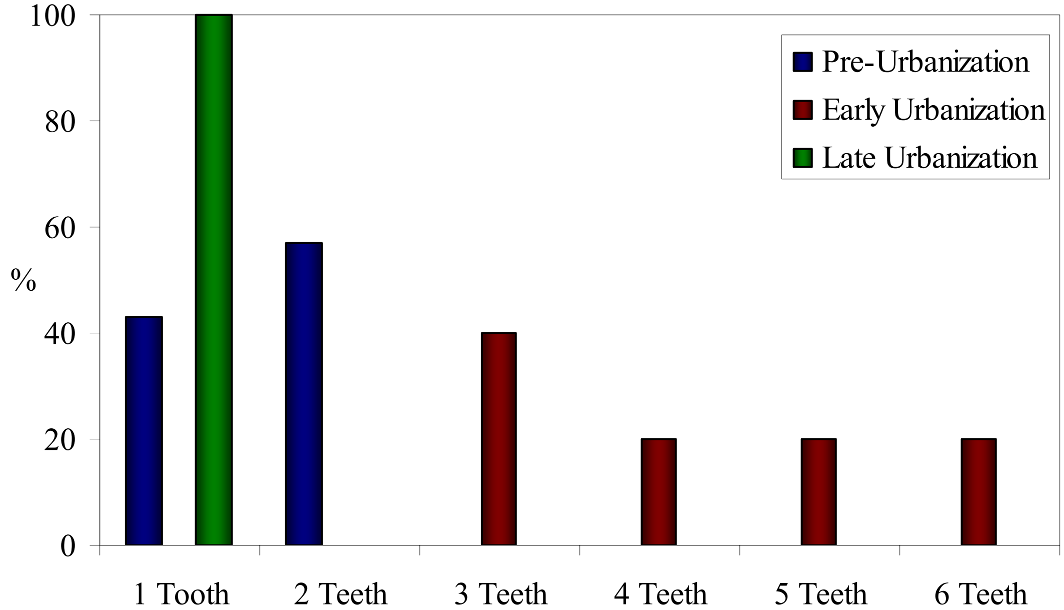

Figure 4.107. Percentage of adult males with single and multiple teeth lost antemortem

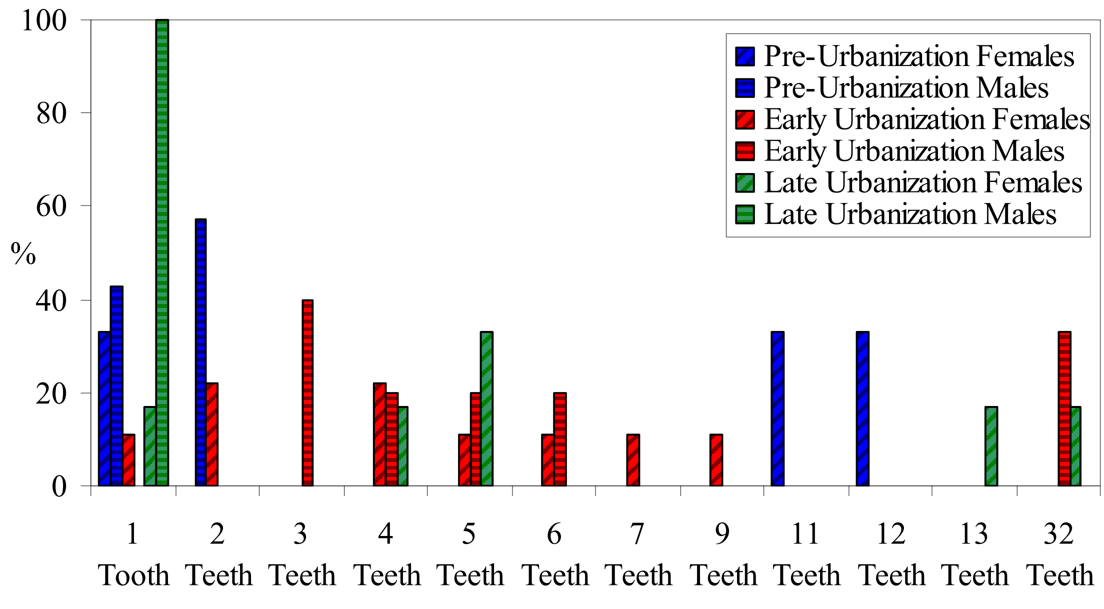

Figure 4.108. Sex-based comparison of percentages of adult males and females with single and multiple teeth lost antemortem

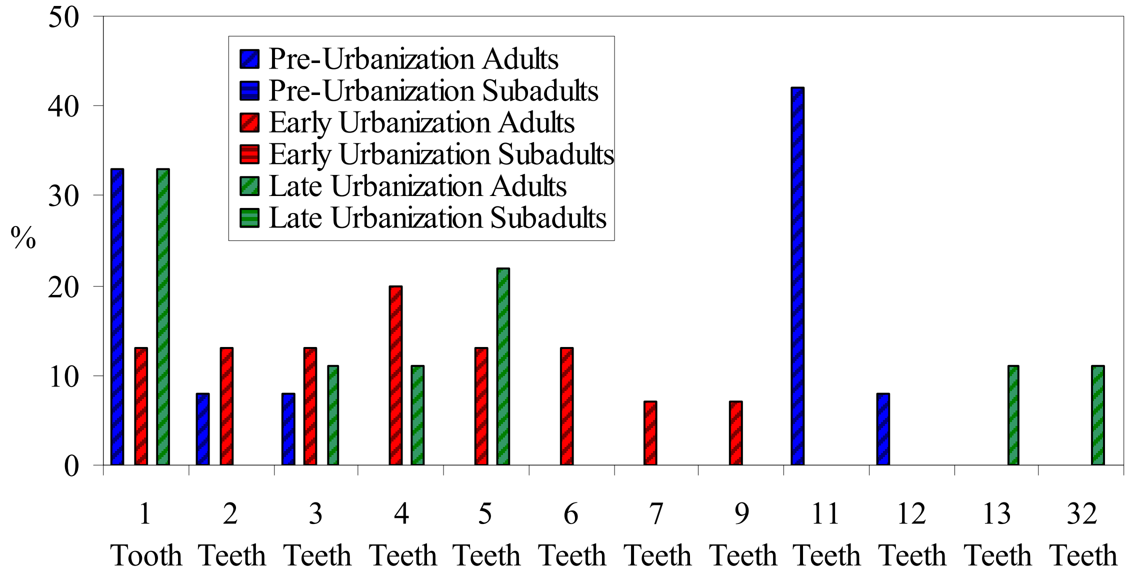

Figure 4.109. Age-based comparison of percentages of adults and subadults with single and multiple teeth lost antemortem

of periapical lesions reveal no significant difference among the three temporal samples (Figures 4.77, 4.80, 4.83; Tables B.94, B.97, B.100). For each cohort, periapical lesions are exhibited in each temporal sample. In subadults, however, there is no evidence of periapical lesions in each sample; therefore, there is no significant temporal trend (Figure 4.86, Table B.103). Sex-based comparisons of the prevalence of periapical lesions lack any significant differences in each temporal sample (Figure 4.89, Table B.106). Age-based comparisons also reveal no significant differences in the prevalence of periapical lesions for each temporal sample (Figure 4.92, Table B.109).

Temporal comparisons of the severity of periapical lesions were carried out in terms of number of lesions. Among adults exhibiting periapical lesions, there is no significant temporal trend in number of lesions among the three samples (Figure 4.110, Table B.129). Similarly, among adult females and adult males, there are no significant trends in the severity of periapical lesions among the three temporal samples (Figures 4.111, 4.112, Tables B.130, B.131). Since subadults do not exhibit any periapical lesions, no comparisons of severity could be conducted. Sex-based comparisons of the severity of periapical lesions do not reveal any significant results for each temporal sample (Figure 4.113, Table B.132). Likewise, age-based comparisons of periapical lesion severity lack any significant results in each sample Figure 4.114, Table B.133).

Dental Calculus

Temporal comparisons of prevalence of dental calculus reveal one significant trend. Age-based comparison in the pre-urbanization sample shows that adults have significantly more dental calculus than subadults (Fisher's exact, $p \leq 0.05$) (Figure 4.92, Table B.109). No significant trends are found in the temporal comparisons of the

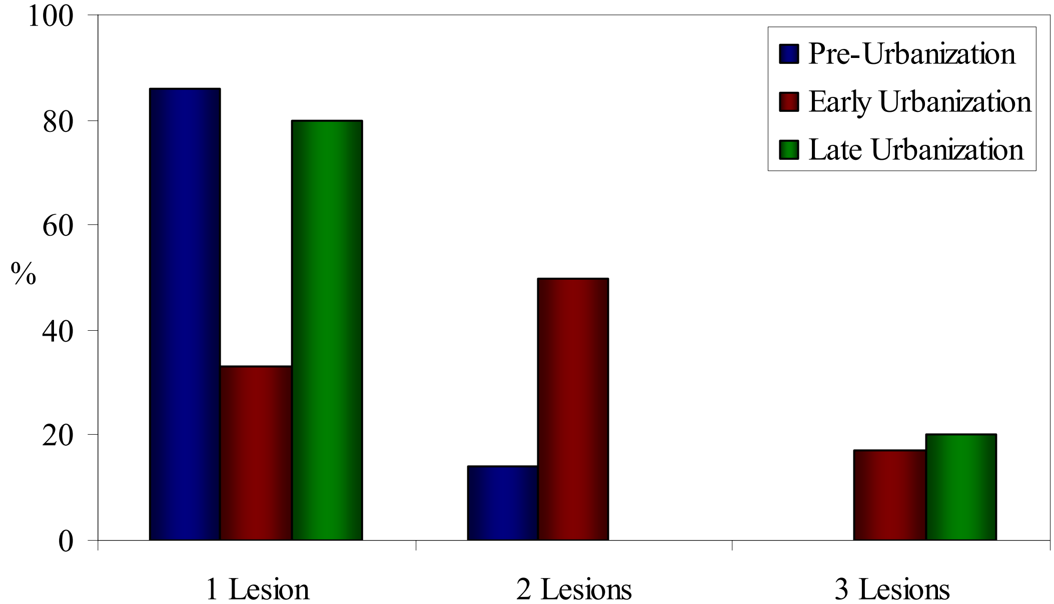

Figure 4.110. Percentage of adults with single and multiple periapical lesions

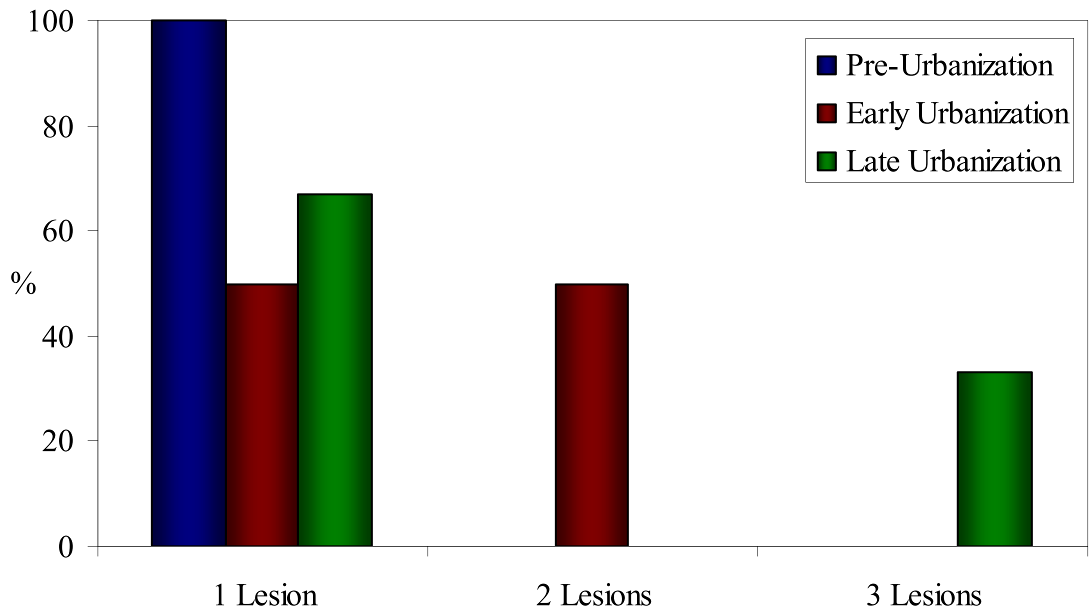

Figure 4.111. Percentage of adult females with single and multiple periapical lesions

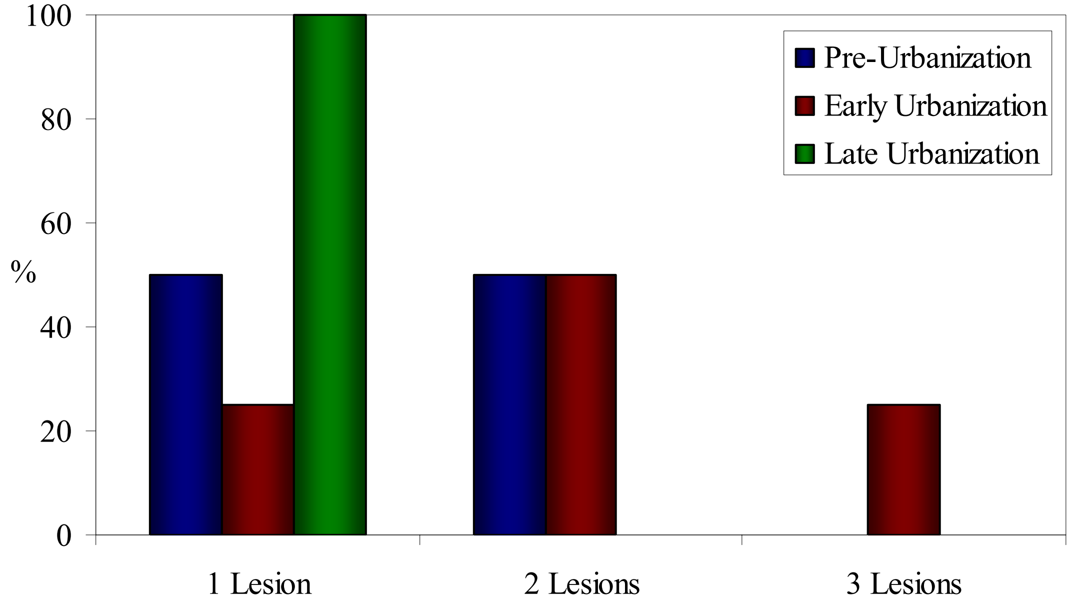

Figure 4.112. Percentage of adult males with single and multiple periapical lesions

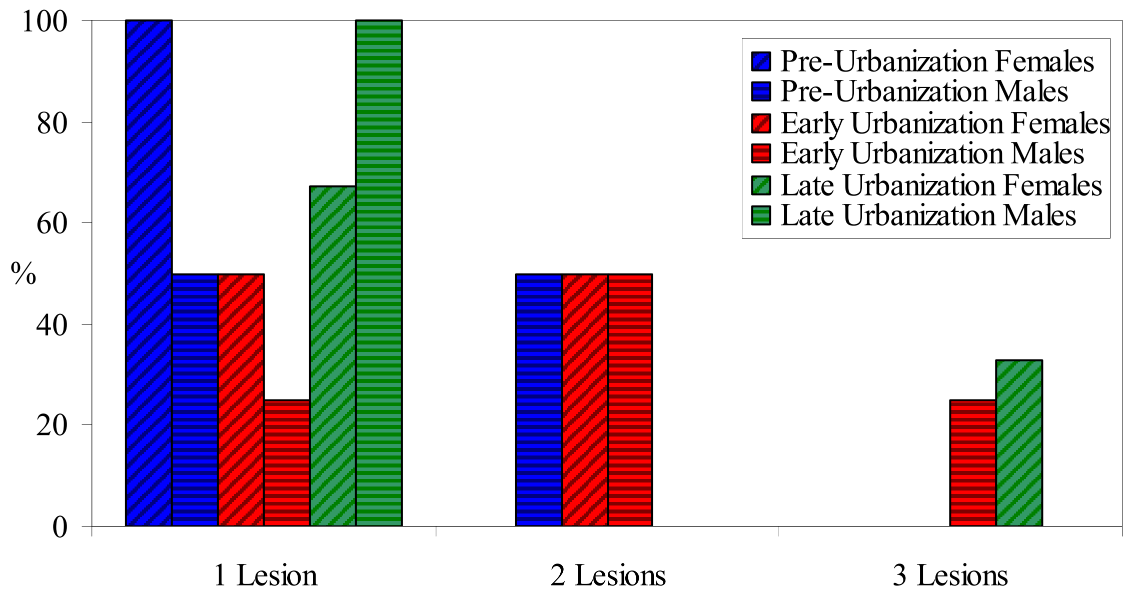

Figure 4.113. Sex-based comparison of percentages of adult males and females with single and multiple periapical lesions

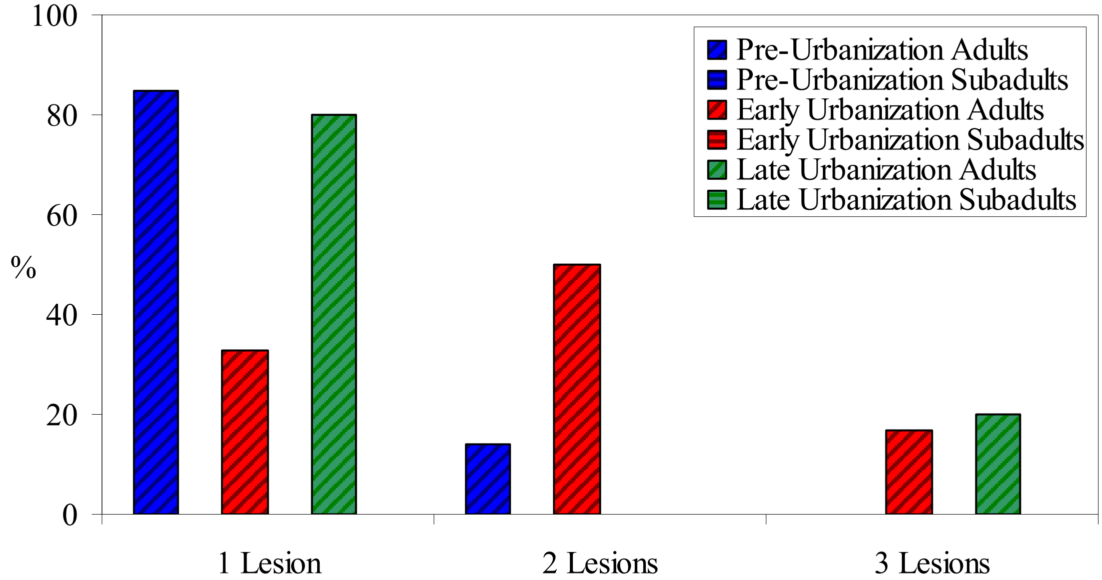

Figure 4.114. Age-based comparison of percentages of adults and subadults with single and multiple periapical lesions

prevalence dental calculus for adults, adult females, adult males, and subadults (Figures 4.77, 4.80, 4.83, 4.86; Tables B.94, B.97, B.100, B.103). Sex-based comparisons of the prevalence of calculus do not reveal any significant results for each temporal sample (Figure 4.89, Table B.106). Age-based comparisons of the prevalence of calculus lack significant differences for the early urbanization and late urbanization samples (Figure 4.92, Table B.109).

No significant trends are found in the temporal comparisons of the severity of dental calculus. Comparisons of adults, adult females, adult males, and subadults reveal no significant difference among the three temporal samples for the severity of calculus (Figures 4.115-4.118; Tables B.134-B.137). Sex-based comparisons of the severity of calculus lack any significant results in any of the temporal samples (Figure 4.119, Table B.138). Likewise, age-based comparisons also do not reveal any significant results for each of the temporal samples (Figure 4.120, Table B.139).

Dental Wear

Temporal comparisons of severity of dental wear reveal several significant trends. Among pre-urbanization adults, the majority have level 4 severity (several areas of dentinal exposure) for the left mandibular second molar, while the majority of early urbanization adults have level 3 severity (initial dentin exposure) (Fisher's exact, $p \leq 0.05$) (Figure 4.121, Table B.141). In addition, for the left mandibular second molar, many early urbanization adults have level 6 severity (coalescence of 3-4 areas of dentinal exposure), while the majority of pre-urbanization adults have level 4 severity (Fisher's exact, $p \leq 0.05$) (Figure 4.121, Table B.141). For the right mandibular second molar, the majority of pre-urbanization adults have level 4 severity, while the majority of early

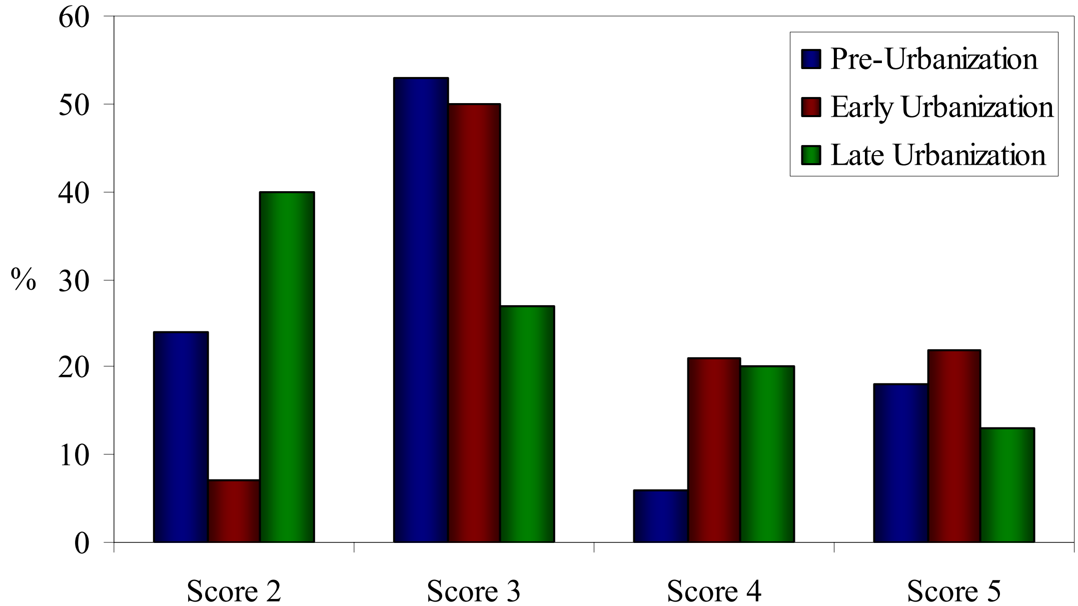

Figure 4.115. Percentage of adults with calculus by severity

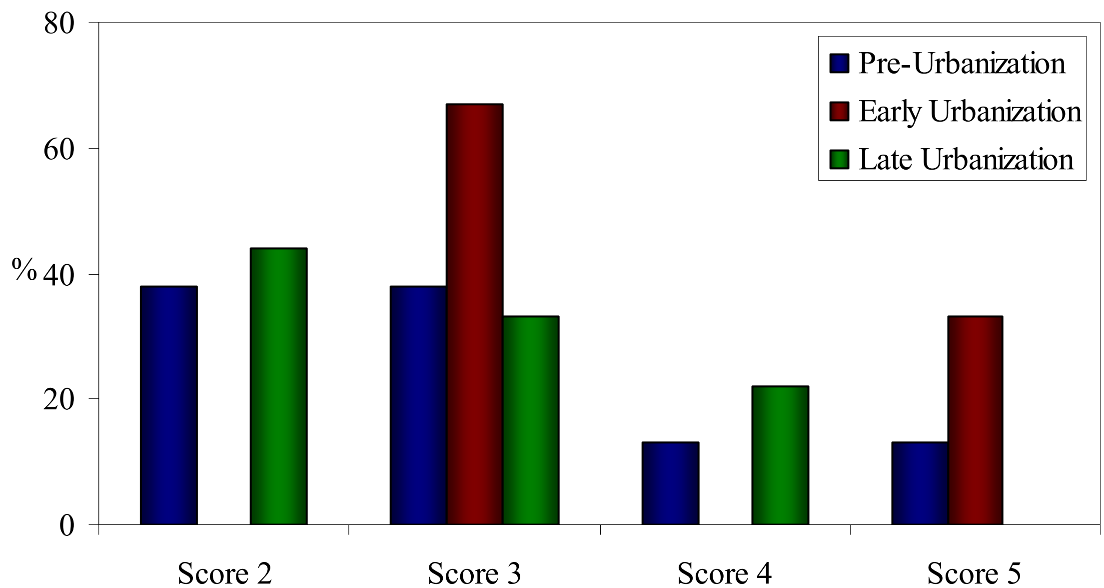

Figure 4.116. Percentage of adult females with calculus by severity

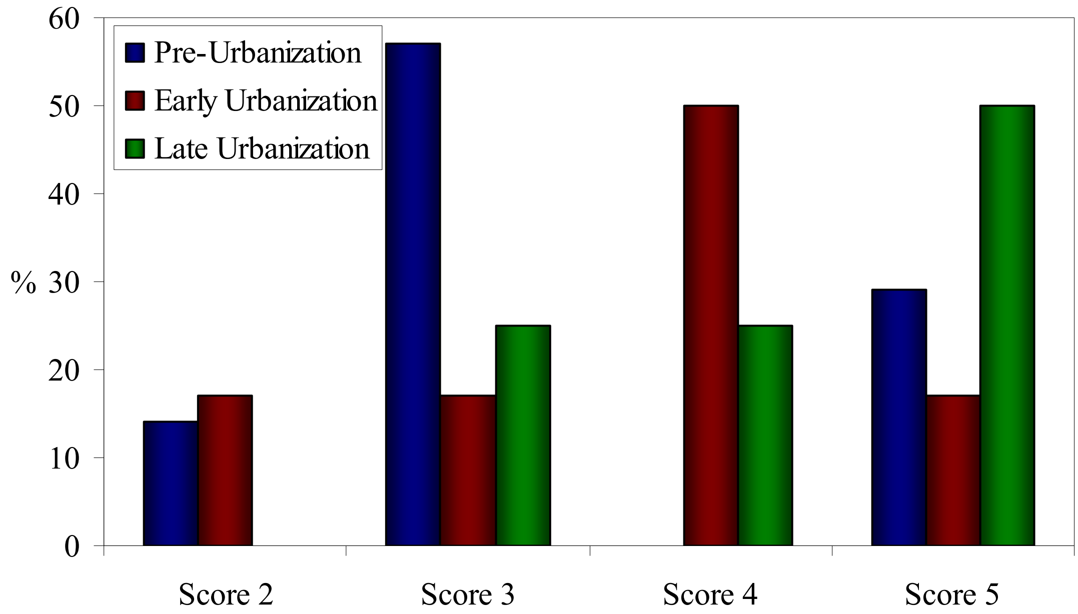

Figure 4.117. Percentage of adult males with calculus by severity

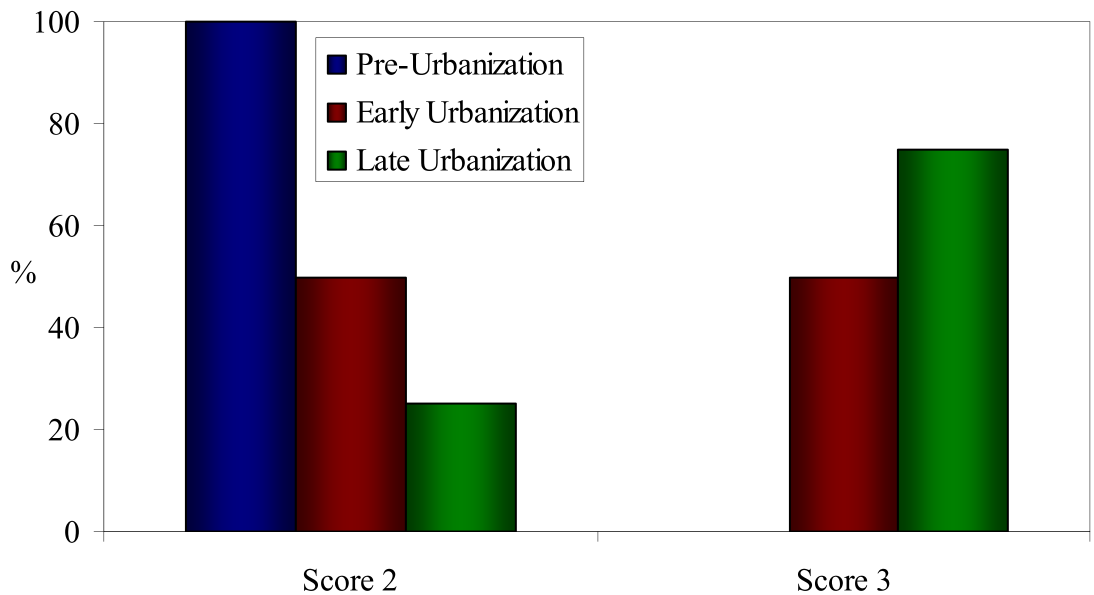

Figure 4.118. Percentage of subadults with calculus by severity

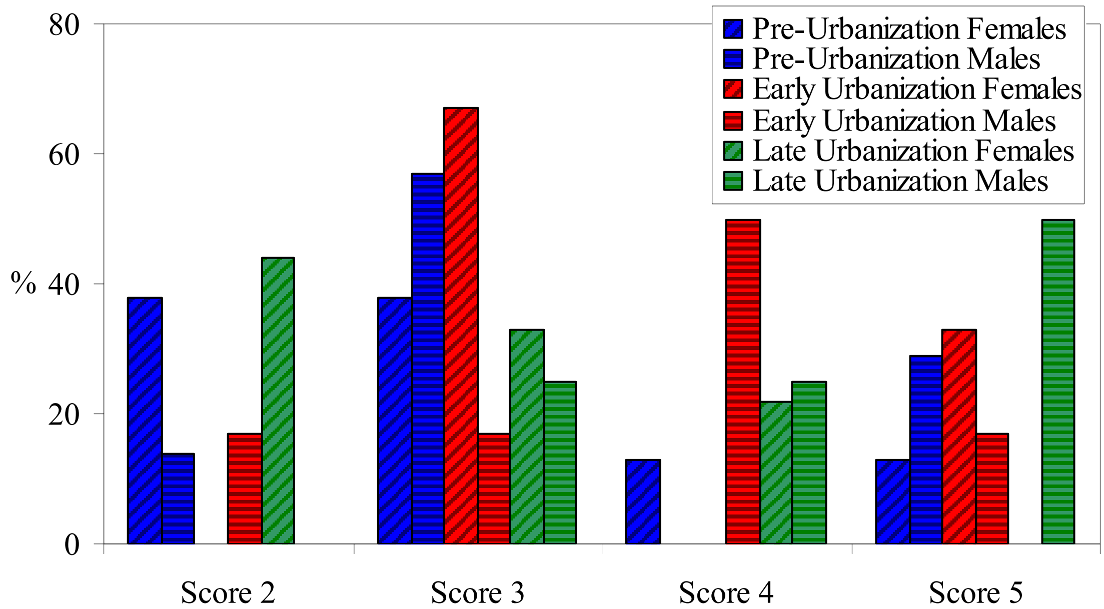

Figure 4.119. Sex-based comparison of percentages of adult males and females with calculus by severity

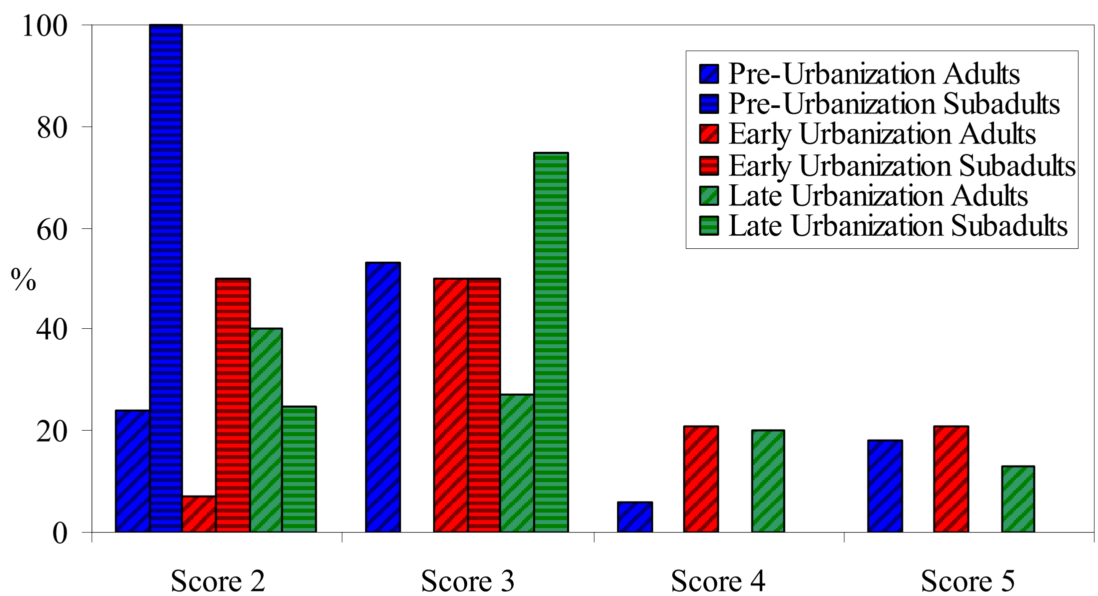

Figure 4.120. Age-based comparison of percentages of adults and subadults with calculus by severity

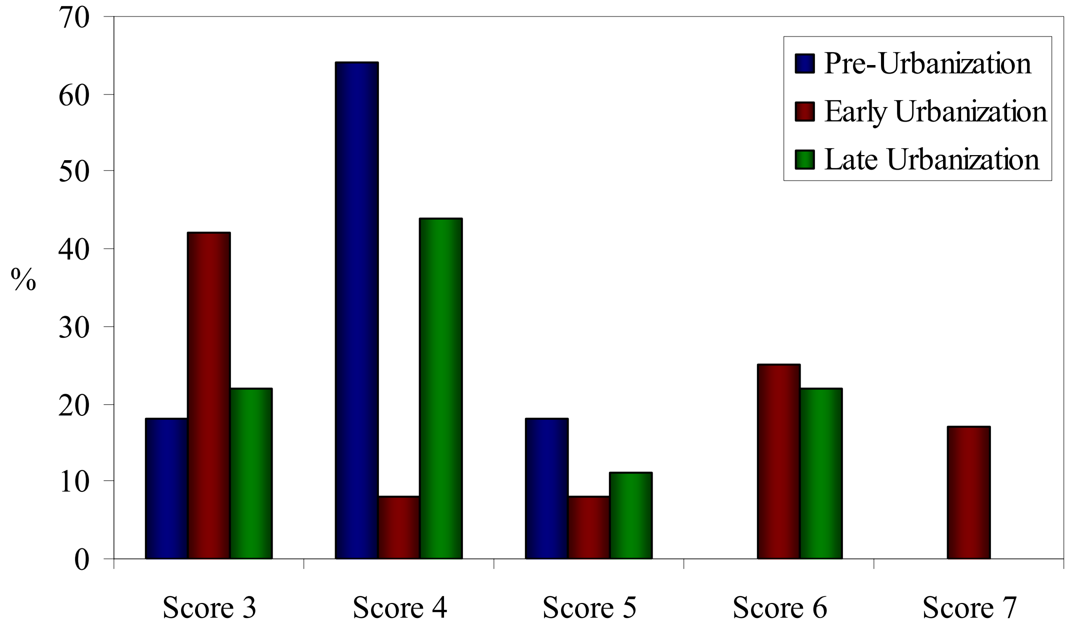

Figure 4.121. Percentage of adults with dental wear of the left mandibular M2 by severity

urbanization adults have level 3 severity (Figure 4.122, Table B.143). For the left maxillary first molar, the majority of early urbanization adults have level 8 severity (loss of crown height and incomplete enamel ring), while the majority of late urbanization adults have level 4 severity (Figure 4.123, Table B.144). For the right maxillary first molar, the majority of early urbanization adults have level 8 severity, while the majority of late urbanization adults have level 4 severity (Figure 4.124, Table B.146). All other temporal comparisons of dental wear severity (left mandibular first molar, right mandibular first molar, left maxillary second molar, and right maxillary second molar) for adults reveal no significant trends among the three samples (Tables B.140, B.142, B.145, B.147).

Among adult females, there is only one significant trend from the comparison of severity of dental wear. For the right mandibular second molar, the majority of pre-urbanization females have level 4 severity, and the majority of the early urbanization females have level 3 severity (Fisher's exact, $p \leq 0.05$) (Figure 4.125, Table B.151). All other molars (left mandibular first and second molars, right mandibular first molar, and right and left maxillary first and second molars) have no significant trends for dental wear severity among the three temporal samples (Tables B.148-B.150, B.152-B.155). Temporal comparisons of dental wear severity in adult males lack any significant trends among the three samples (Tables B.156-B.163). Among subadults, however, there is one significant trend. For the left mandibular first molar, the majority of pre-urbanization subadults have level 1 severity (unworn), while the majority of early urbanization adults have level 2 severity (blunting of cusps) (Fisher's exact, $p \leq 0.05$) (Figure 4.126, Table B.164). All other molars (left mandibular second molar, right mandibular first and second

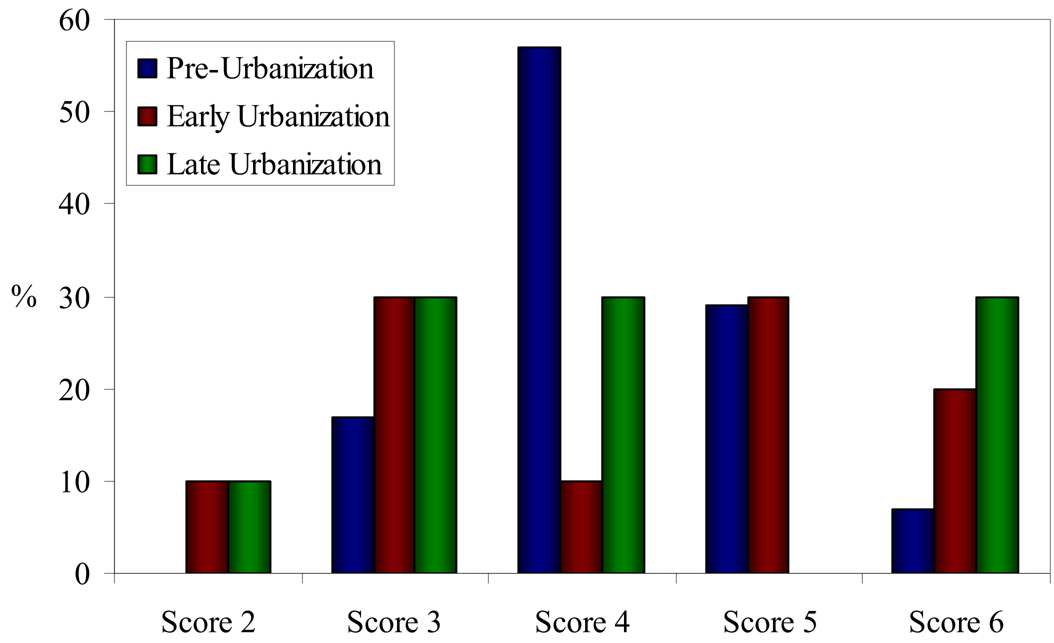

Figure 4.122. Percentage of adults with dental wear of the right mandibular M2 by severity

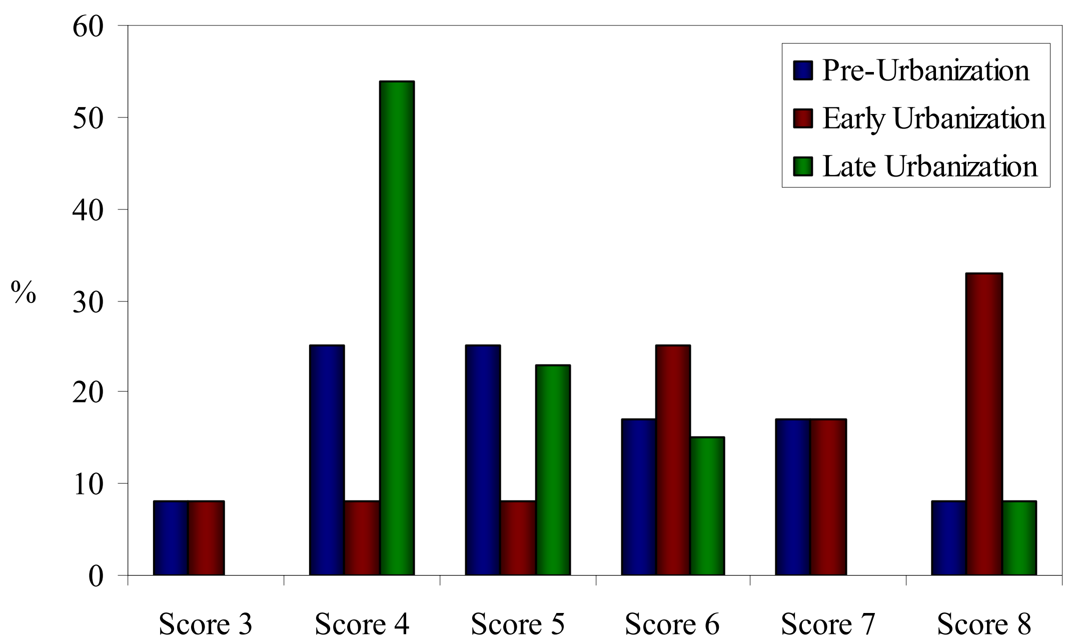

Figure 4.123. Percentage of adults with dental wear of the left maxillary M1 by severity

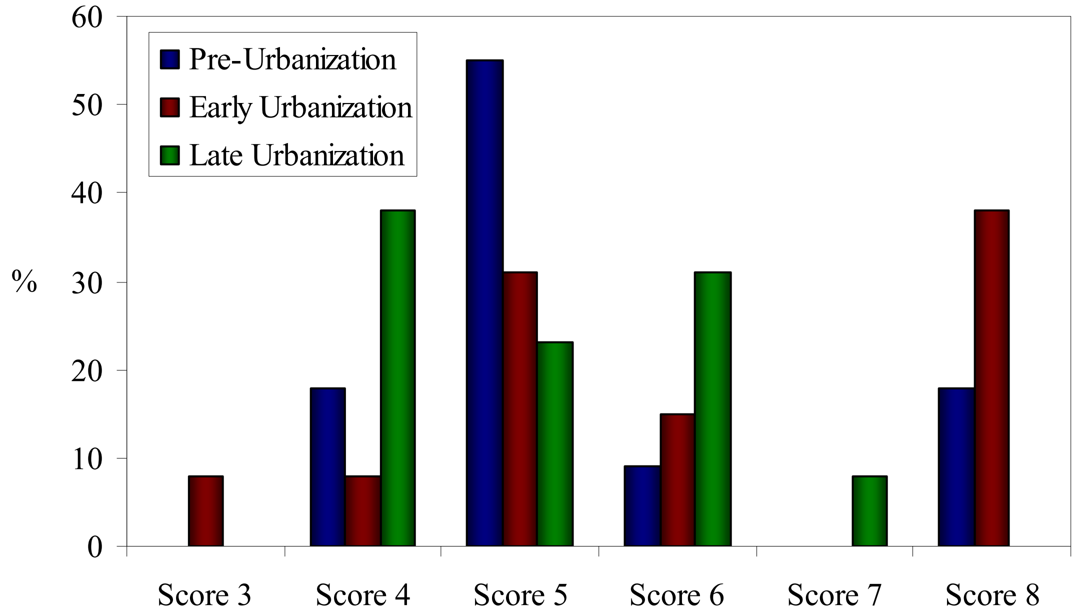

Figure 4.124. Percentage of adults with dental wear of the right maxillary M1 by severity

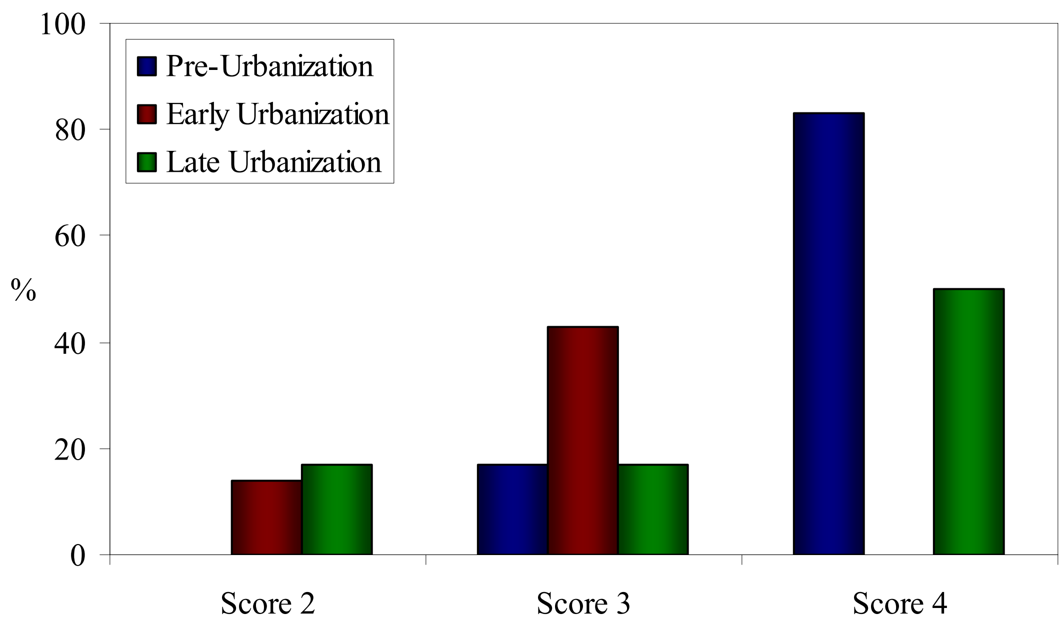

Figure 4.125. Percentage of adult females with dental wear of the right mandibular M2 by severity

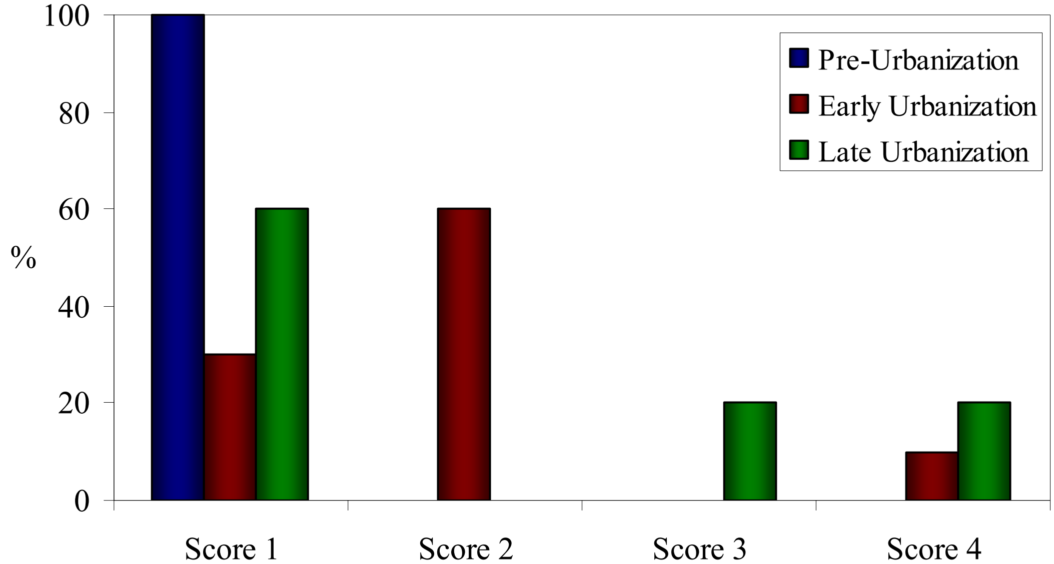

Figure 4.126. Percentage of subadults with dental wear of the left mandibular M1 by severity

molars, and right and left maxillary first and second molars) in subadults lack any significant trends in severity of dental wear (Tables B.165-B.171). Sex-based comparisons of dental wear severity reveal no significant differences in each of the temporal samples for any molar (Tables B.172-B.179).

Temporal comparisons of dental wear severity were also carried out for three age cohorts: young adults, middle adults, and old adults. For each of these age cohorts, males and females were analyzed separately. No significant trends are found in the temporal comparisons of severity of dental calculus for young adult females, middle adult females, and old adult females for any molar (Tables B.180-B.197). Similarly, temporal comparisons of dental wear severity in young adult males, middle adult males, and old adult males also lack any significant trends among the three samples (Tables B.198-B.219).

Skeletal Indicators of Health: Stature

Temporal comparison of the mean femoral length of adult females and adult males reveal no significant differences among the samples (Monte Carlo, $p \leq 0.05$). The mean femoral lengths for pre-urbanization, early urbanization, and late urbanization females are 410.2mm, 424.7mm, and 415.4mm, respectively (Figure 4.127). The lack of significant difference in femur length among the three temporal samples reflects the similarity in stature of females over time. The mean femoral lengths for pre-urbanization and early urbanization males are 457.2mm and 464.0mm, respectively; however, as there was only a single femur that could be measured for late urbanization males, no mean femoral length could be determined (Figure 4.128). As a result, only a comparison of the

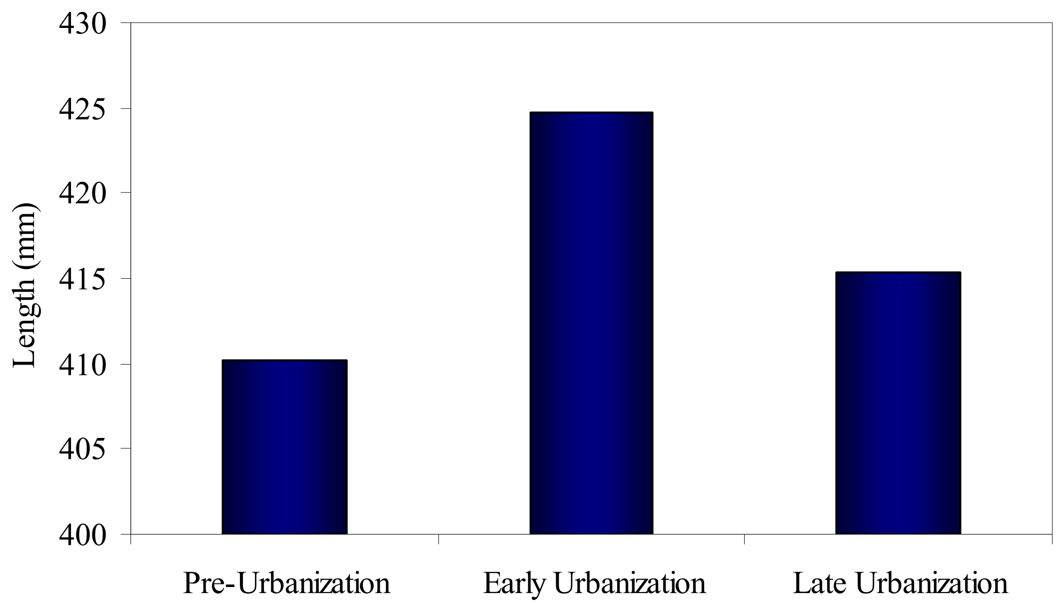

Figure 4.127. Temporal comparison of mean femoral length in adult females

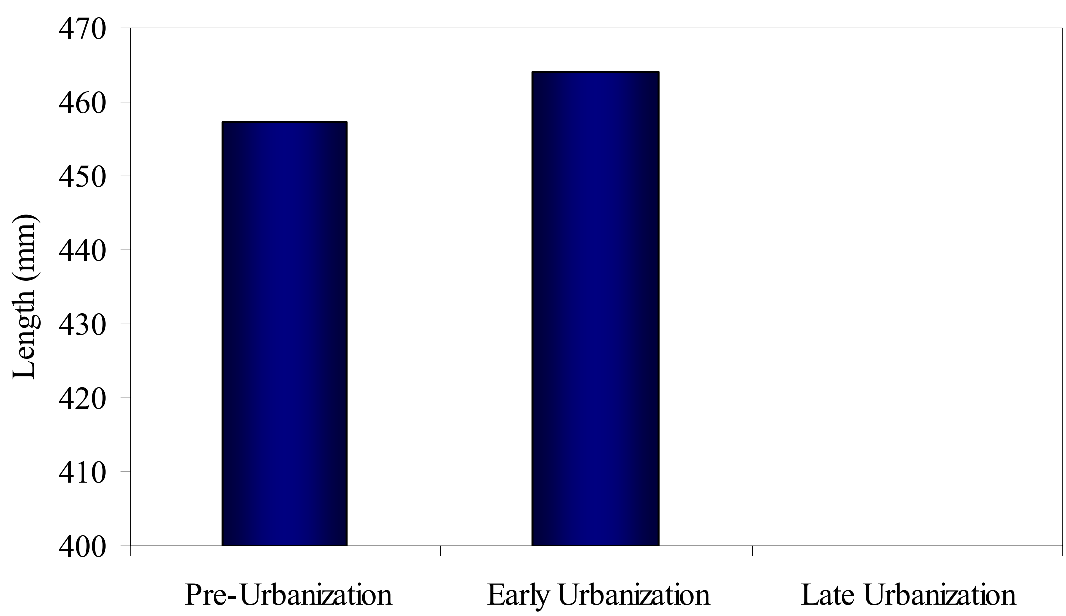

Figure 4.128. Temporal comparison of mean femoral length in adult males

pre-urbanization and early urbanization males could be conducted. The lack of significant difference between the mean femoral lengths of these two temporal samples indicates that the stature for males did not change between these two periods.

Skeletal Indicators of Lifestyle: Activity Patterns

Temporal comparisons of prevalence of DJD by individual and by specific joints reveal several significant trends. For the left elbow of adults, there is significantly greater prevalence of DJD in the late urbanization than in the early urbanization (Fisher's exact, $p \leq 0.05$) (Figure 4.129, Table B.221). For the left wrist of adults, there is also significantly greater prevalence of DJD in the late urbanization than in the early urbanization (Fisher's exact, $p \leq 0.05$) (Figure 4.129, Table B.221). Also in adults, the left and right hips have significantly greater prevalence of DJD in the pre-urbanization sample than in the early urbanization sample (Fisher's exact, $p \leq 0.05$) (Figure 4.131, Table B.222). Temporal comparison of the prevalence of DJD in adults does not reveal any significant trends among the three samples (Figure 4.130, Table B.220). For the remaining joints (TMJ, left and right shoulders, right elbow, right wrist, right and left knees, right and left ankles, and all vertebrae), there are also no significant trends among the three temporal samples (Figures 4.129, 4.131-4.132, Tables B.221-B.223).

Among adult females, there are a few significant trends in the prevalence of DJD. For the left elbow, there is a significantly greater prevalence of DJD in the late urbanization sample than in the early urbanization sample (Fisher's exact, $p \leq 0.05$) (Figure 4.133, Table B.225). For the right hip, the prevalence of DJD is significantly greater in pre-urbanization females than in early urbanization females (Fisher's exact,

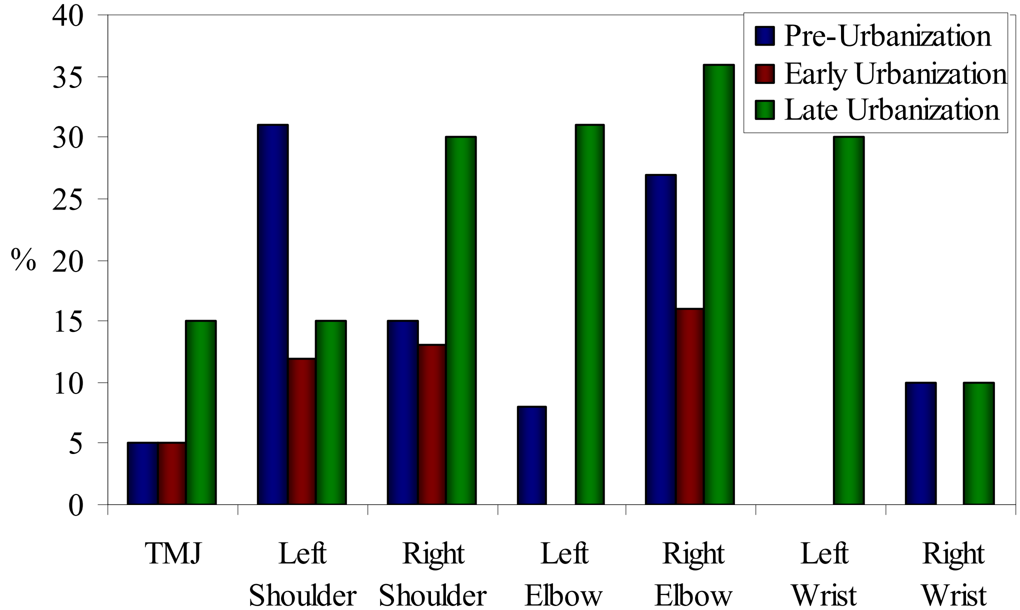

Figure 4.129. Percentage of adults with DJD – upper limb joints

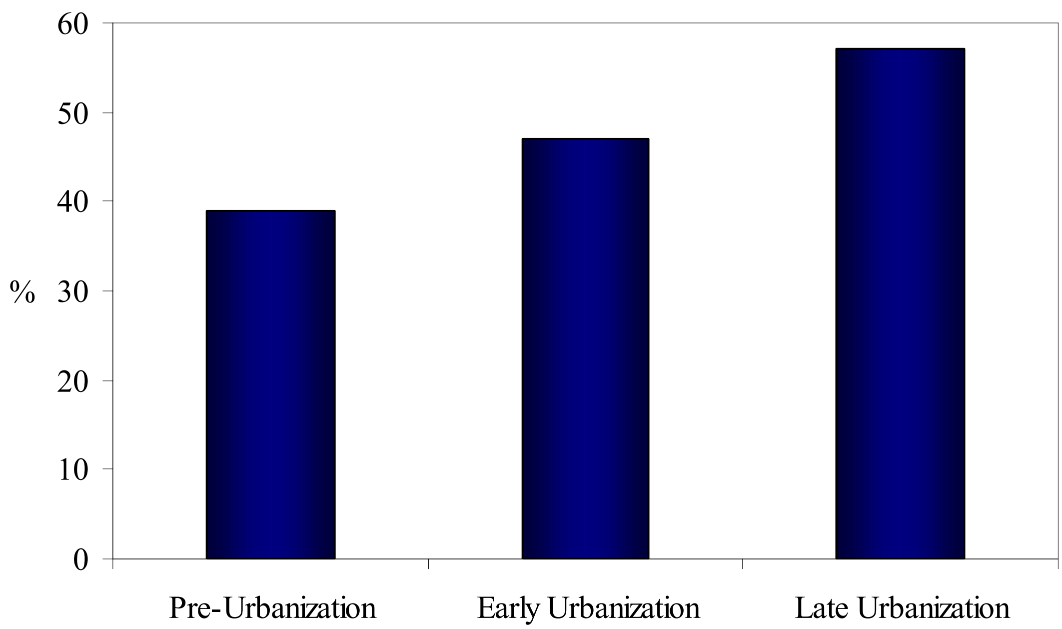

Figure 4.130. Percentage of adults with DJD

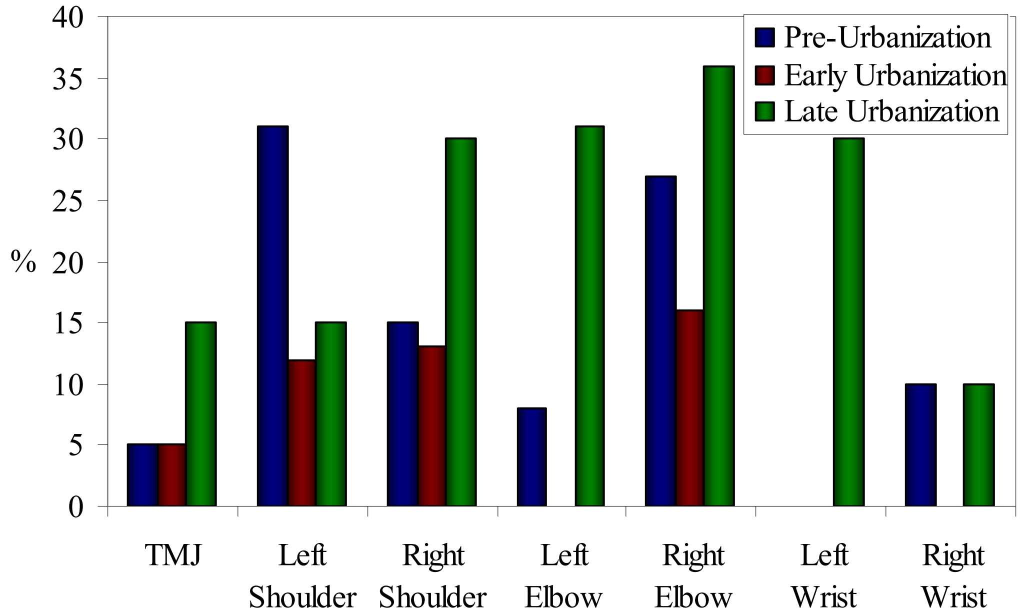

Figure 4.131. Percentage of adults with DJD – lower limb joints

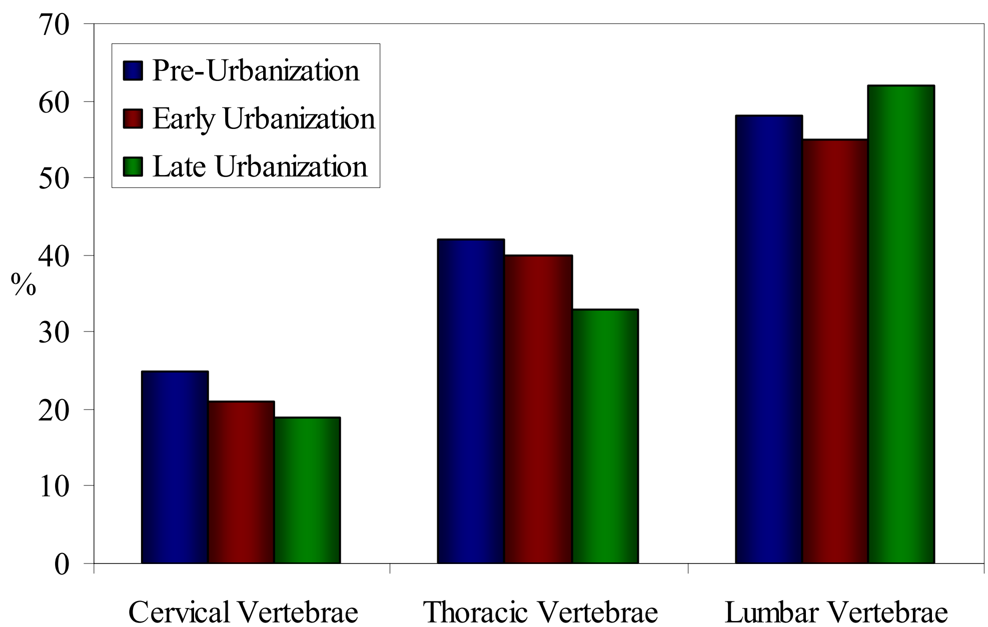

Figure 4.132. Percentage of adults with DJD – vertebrae

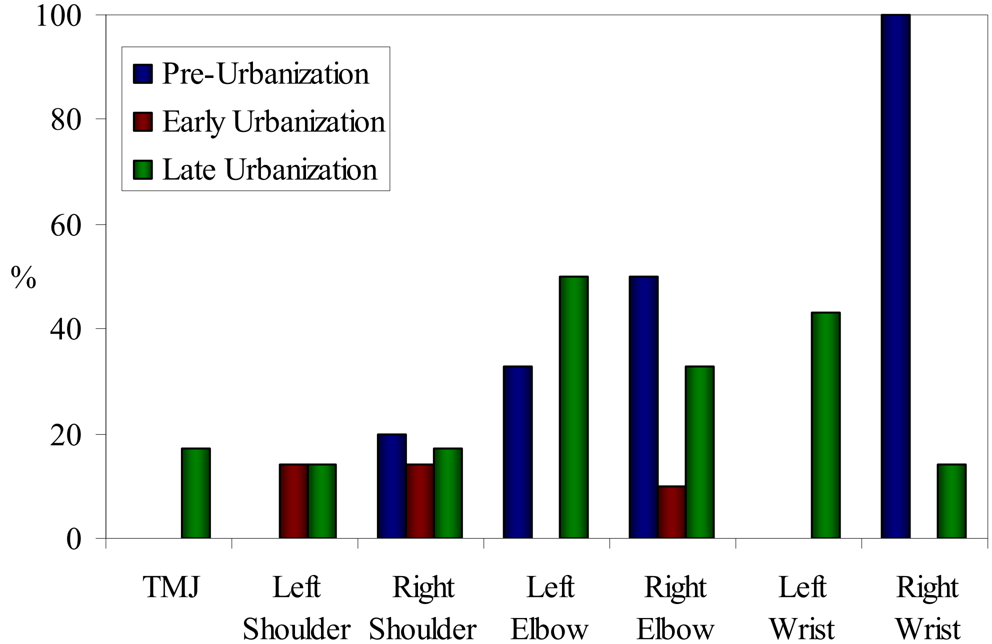

Figure 4.133. Percentage of adult females with DJD – upper limb joints

$p \leq 0.05$) (Figure 4.134, Table B.226). Temporal comparison of the prevalence of DJD in adult females does not reveal any significant trends among the three samples (Figure 4.135, Table B.224). For the remaining joints (TMJ, left and right shoulders, right elbow, left and right wrists, left hip, right and left knees, right and left ankles, and all vertebrae), there are no significant trends in the prevalence of DJD among the three temporal samples (Figures 4.133, 4.134, 4.136, Tables B.225-B.227). In adult males, temporal comparisons of the prevalence of DJD by individuals and by specific joints lack any significant trends (Figures 4.137-4.140, Tables B.228-B.231). Since DJD is an age-progressive disorder, subadults do not exhibit degenerative changes; therefore, they were not included in this analysis.

Sex-based comparison of the prevalence of DJD reveals a single significant result. In the early urbanization sample, males have a significantly greater prevalence of DJD than females (Fisher's exact, $p \leq 0.05$) (Figure 4.141, Table B.232). In the pre-urbanization sample, males and females do not differ in the prevalence of DJD. In the late urbanization sample, although males and females do not differ significantly, the prevalence rate is greater in males than in females. Sex-based comparisons of the prevalence of DJD in specific joints reveal no significant trends among the three samples (Figures 4.141-4.144, Tables B.233-B.235). Age-based comparisons were not carried out as subadults are not affected by DJD. Temporal comparisons of the pattern of DJD prevalence by specific joint reveal no significant trends for adults, adult females, and adult males (Table B.236). Each temporal sample has a similar pattern of joint involvement.

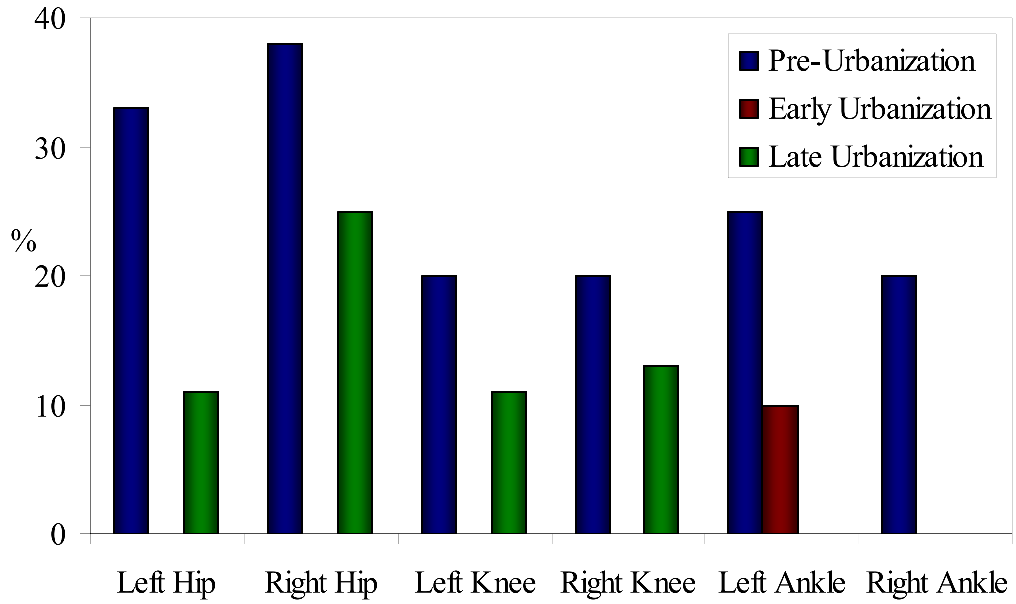

Figure 4.134. Percentage of adult females with DJD – lower limb joints

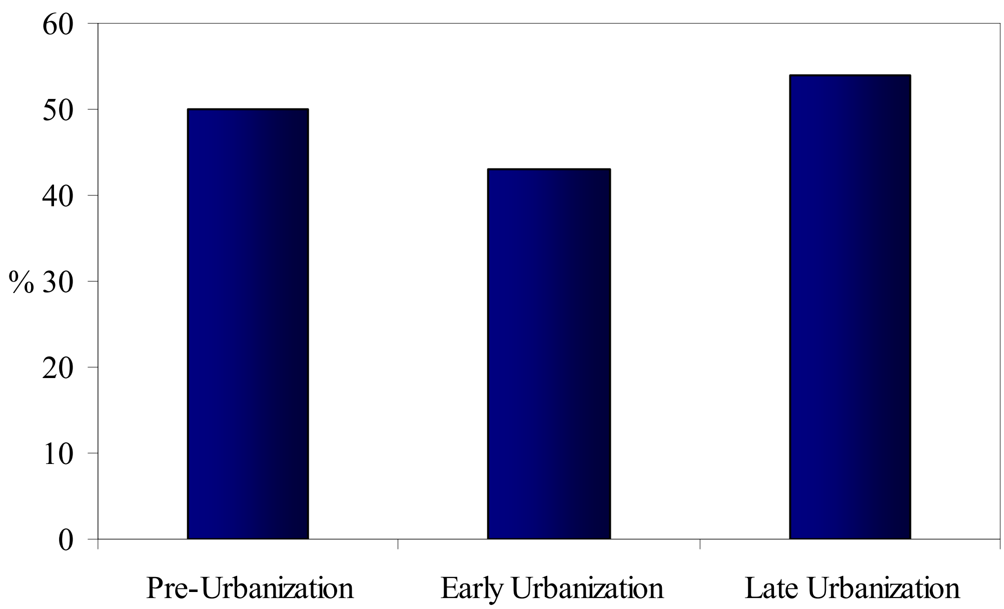

Figure 4.135. Percentage of adult females with DJD

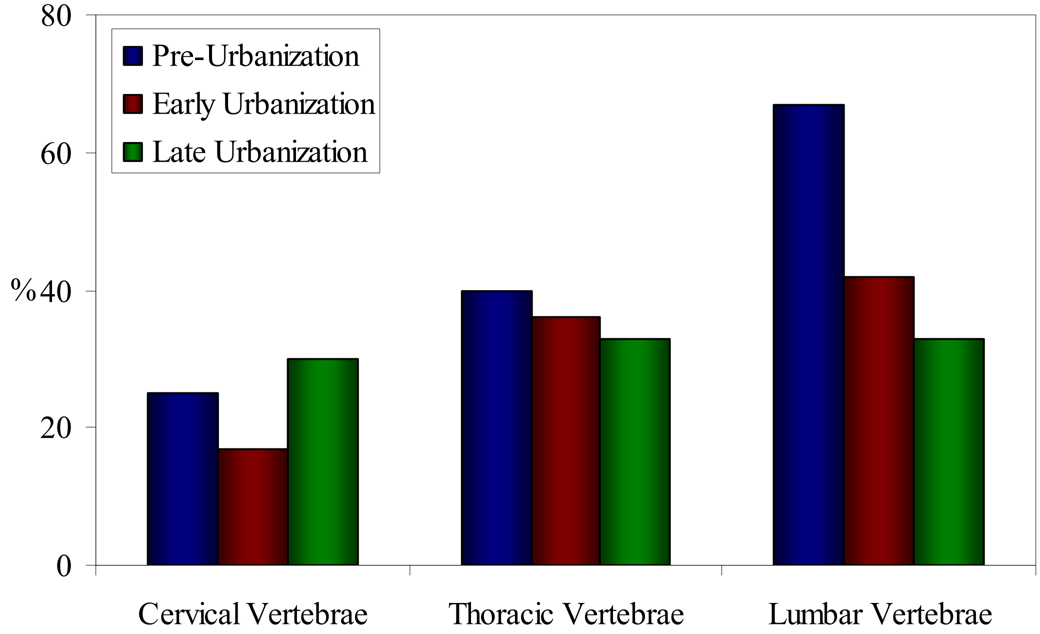

Figure 4.136. Percentage of adult females with DJD – vertebrae

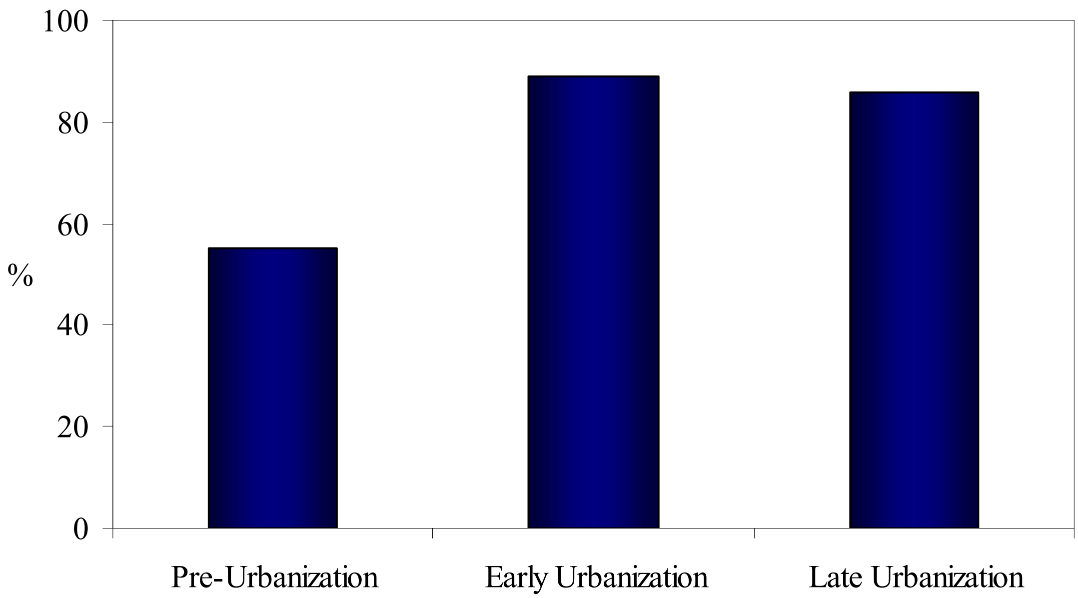

Figure 4.137. Percentage of adult males with DJD

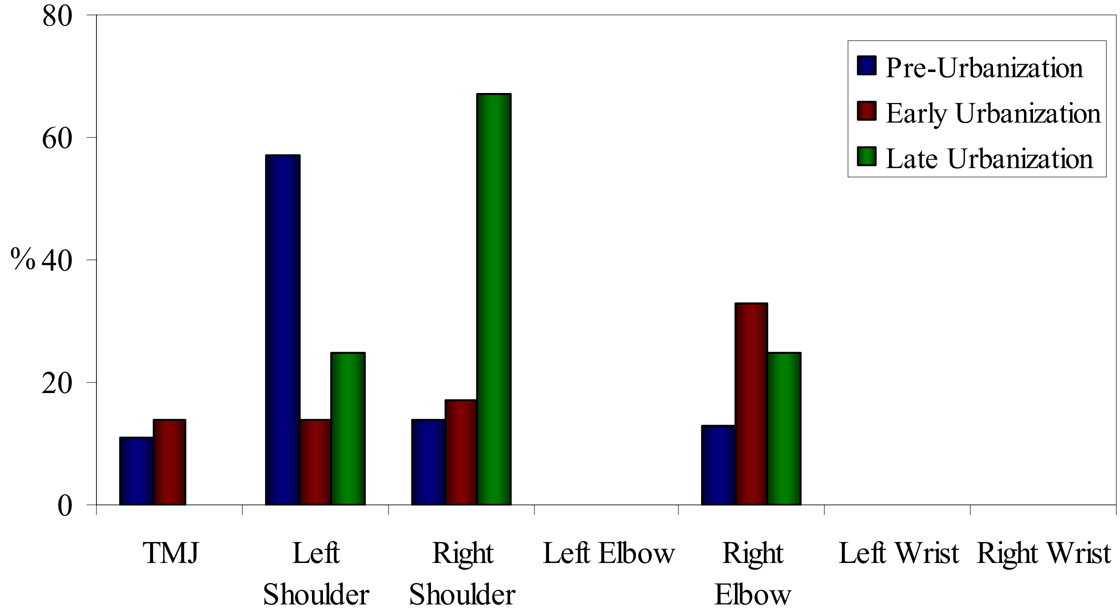

Figure 4.138. Percentage of adult males with DJD – upper limb joints

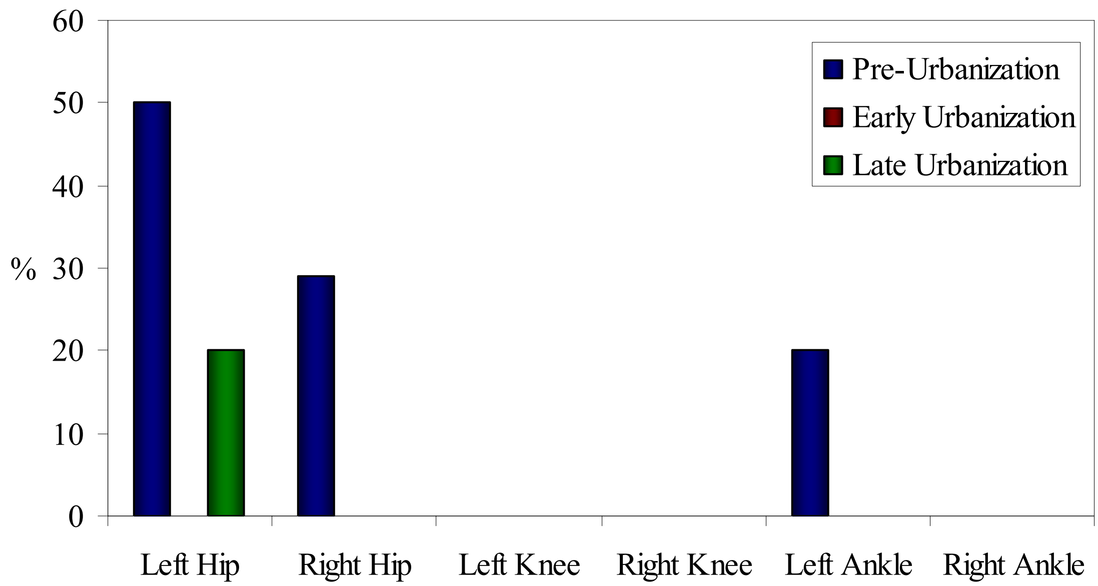

Figure 4.139. Percentage of adult males with DJD – lower limb joints

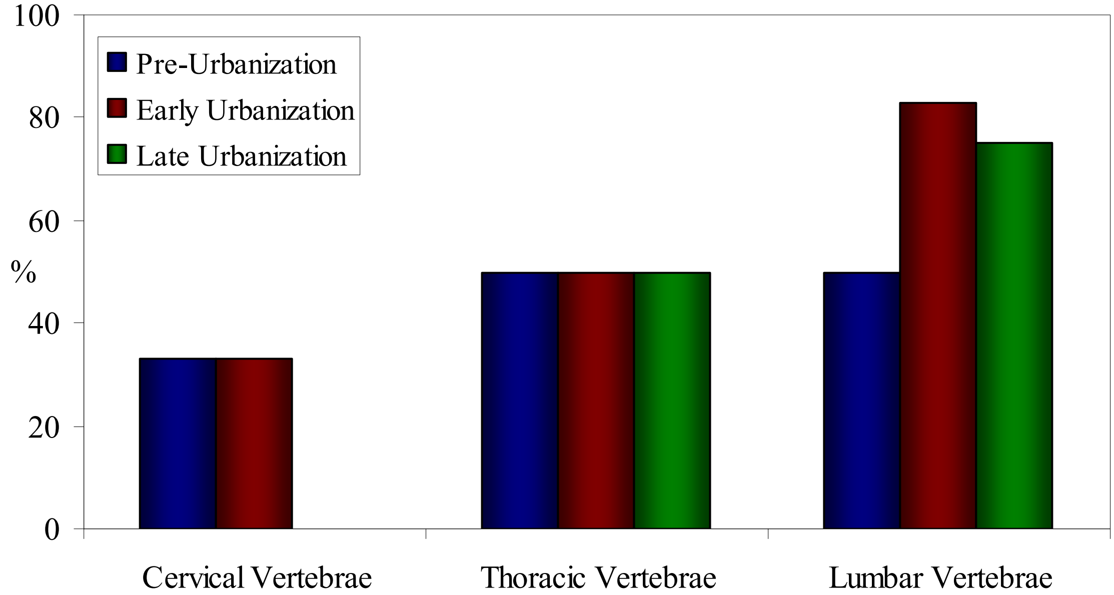

Figure 4.140. Percentage of adult males with DJD – vertebrae

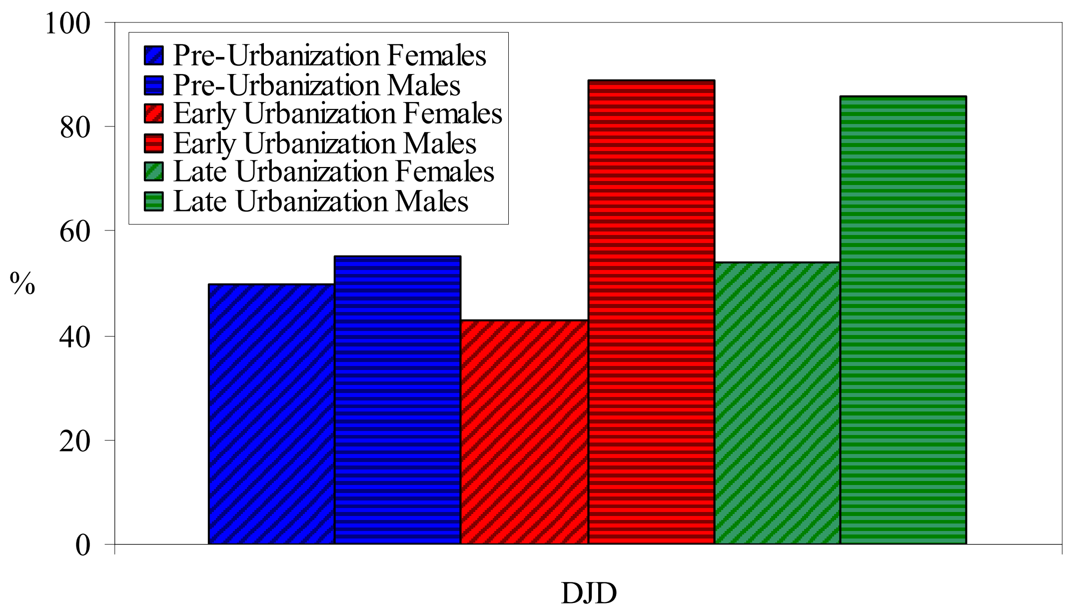

Figure 4.141. Sex-based comparison of percentages of adult males and females with DJD

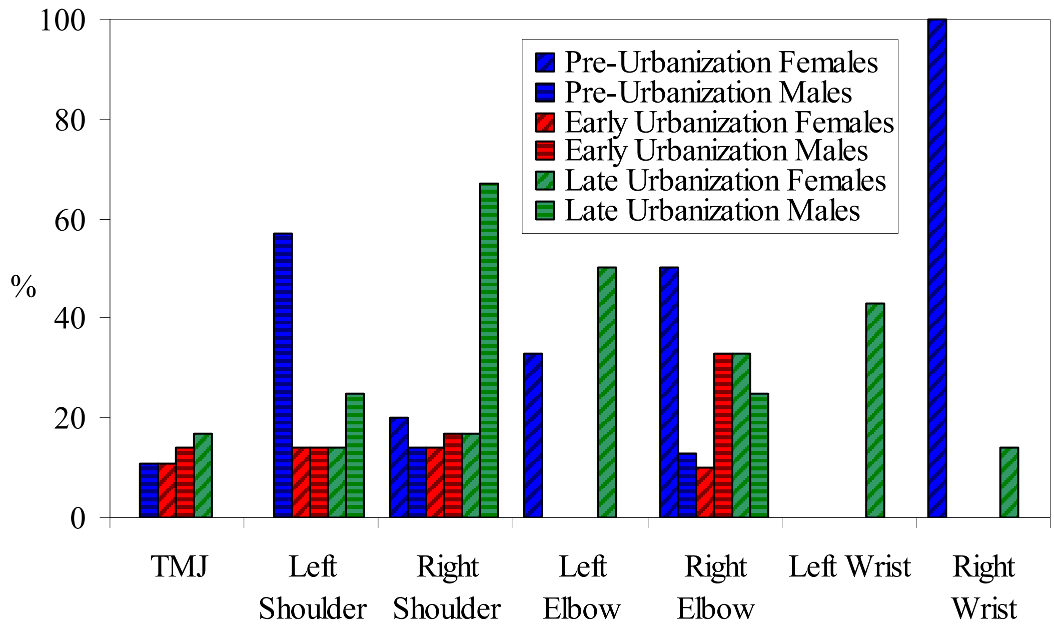

Figure 4.142. Sex-based comparison of percentages of adult males and females with DJD – upper limb joints

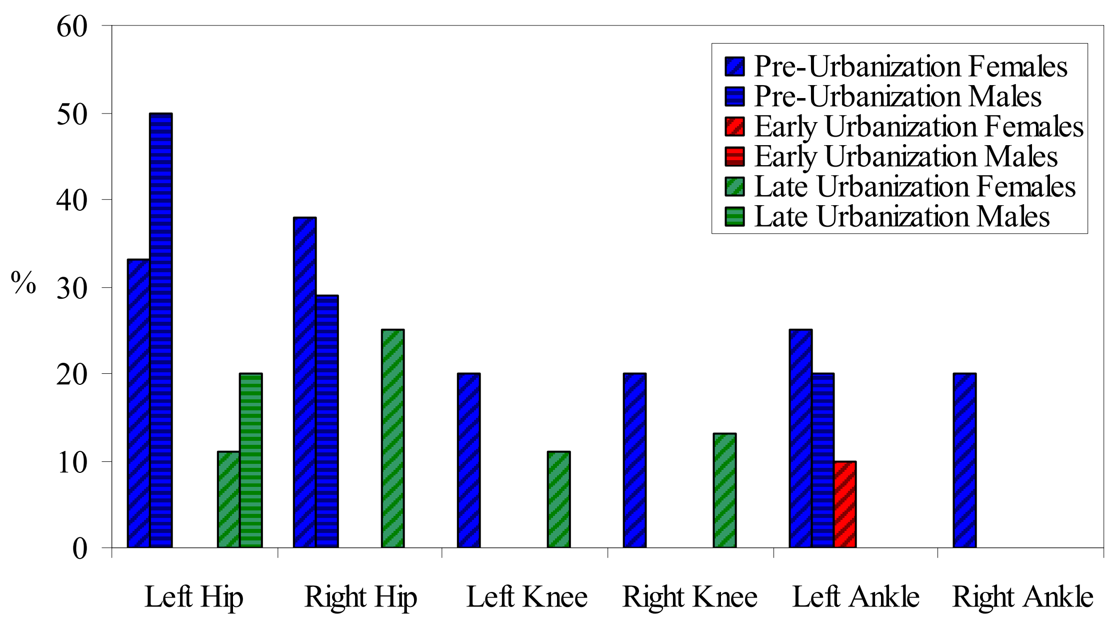

Figure 4.143. Sex-based comparison of percentages of adult males and females with DJD – lower limb joints

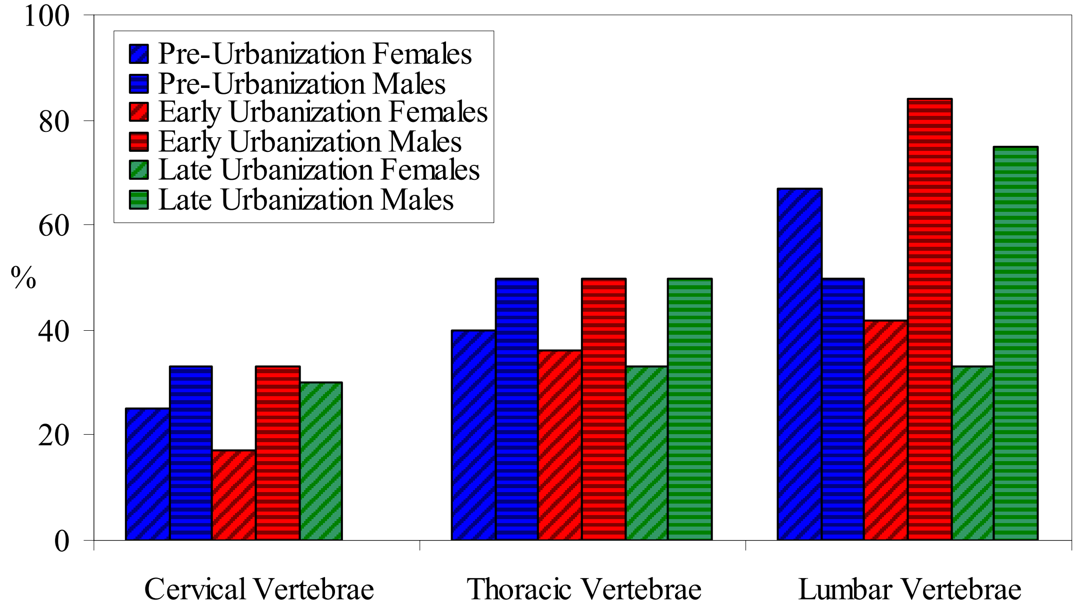

Figure 4.144. Sex-based comparison of percentages of adult males and females with DJD – vertebrae

Temporal comparisons of the severity of DJD in adults, adult females, and adult males reveal no significant trends among the three samples. In adults, the right shoulder, right elbow, left and right wrists, left and right hips, right knee, and left ankle exhibit level 2 severity (slight marginal lipping and small osteophytes) and level 3 severity (substantial marginal lipping and large osteophytes), although they do not differ significantly among the three temporal samples (Tables B.237-B.244). Levels 4 and 5 severity are not present in any joint. The cervical, thoracic, and lumbar vertebrae of adults also exhibit two levels of severity: level 2 (osteophytes on at least one vertebral body) and level 3 (extensive osteophytes on at least one vertebral body); however, the severity of DJD does not differ among the three temporal samples (Tables B.245-247). The remaining joints in adults (TMJ, left shoulder, left elbow, left knee, and right ankle) only exhibit a single level of severity – level 2; therefore, no temporal comparisons could be conducted (Table B.248).

Temporal comparisons of DJD severity in adult females also lack any significant trends among the three samples. The right shoulder, right elbow, left and right wrists, left and right hips, and left ankle exhibit severity levels 2 and 3, but do not reveal any significant trends (Tables B.249-B.255). The cervical, thoracic, and lumbar vertebrae have severity levels 2 and 3; however, there are no significant trends in the severity of DJD among the three temporal samples (Tables B.256-B.258). All other joints in adult females (TMJ, left shoulder, left elbow, left and right knees, and right ankle) only have a single level of severity (Table B.259). All but the right knee has level 2 severity, while the right knee exhibits level 3 severity. Temporal comparisons of DJD severity in adult males do not reveal any significant trends among the three samples. The cervical, thoracic, and lumbar vertebrae exhibit severity levels 2 and 3, but comparisons of DJD severity do not have any significant results (Tables B.260-B.262). All limb joints and TMJ only have a single severity level (Table B.263). The TMJ, left and right shoulders, right elbow, left and right hips, and left ankle exhibit level 2 severity, while the left elbow, left and right wrists, left and right knees, and right ankle do not exhibit any degenerative changes.

Sex-based comparisons of DJD severity lack any significant differences in each of the temporal periods. The right shoulder, right elbow, left and right wrists, left and right hips, and left ankle have two levels of severity for comparison; however, the severity of DJD does not differ between males and females (Tables B.264-B.270). The cervical, thoracic, and lumbar vertebrae also have two levels of severity for comparison, but there are no significant differences between males and females for severity of DJD (Tables B.271-B.273). The remaining joints (TMJ, left shoulder, left elbow, left and right knees, and right ankle) only have a single level of severity; therefore, they could not be compared between males and females (Table B.274). Of these joints, all but the right knee have level 2 severity; the right knee has level 3 severity.

Temporal comparisons of DJD severity were also carried out for three age cohorts: young adults, middle adults, and old adults. For each of these age cohorts, males and females were analyzed separately. No significant trends are found in the temporal comparisons of the severity of DJD for young adult females, middle adult females, and old adult females for any joint (Tables B.275-B.286). Similarly, temporal comparisons of DJD severity in young adult males, middle adult males, and old adult males also lack any significant trends among the three samples (Tables B.287-B.297).

Skeletal Indicators of Lifestyle: Trauma

Temporal comparisons of prevalence of traumatic injuries reveal no significant trends among the three samples for adults, adult females, adult males, and subadults (Figures 4.145-4.147, Tables B.298-B.301). Overall the prevalence of trauma is very low regardless of age and sex cohort or temporal sample. Only six individuals with traumatic injuries were found for the skeletal sample as a whole. Most of these individuals have evidence of fractures, which may be due to accidents. Only one individual has traumatic injuries that are clearly evidence of interpersonal violence.

Among adult females, a single individual has evidence of trauma. In the late urbanization sample, a young adult female has a compression fracture of the second lumbar vertebrae (Śródka, burial 46). The majority of traumatic injuries, however, are found in the adult males of each temporal sample, as each sample has one or more individuals with evidence of trauma. In late urbanization, a middle adult male has a healed injury from sharp force trauma of the left frontal, which may be a weapon wound (Śródka, burial 43, Figure 4.148). In the early urbanization, a middle adult male has healed fractures of the right radius and ulna (Śródka, burial 54, Figure 4.149) and a young adult male has healed fractures of three right ribs (Śródka, burial 108, Figure 4.150). In the pre-urbanization sample, there is an old adult who has injuries obviously the result of interpersonal violence (Śródka, burial 38, Figures 4.151-4.153). This individual has a large penetrating room, in which a substantial area of his left parietal and temporal are missing, due to a blow by some type of sharp weapon, such as a large blade, sword, or ax (Figure 4.153). An additional blow from this weapon affected the basilar portion of the cranium, effectively decapitating the individual. This injury includes the loss of the left

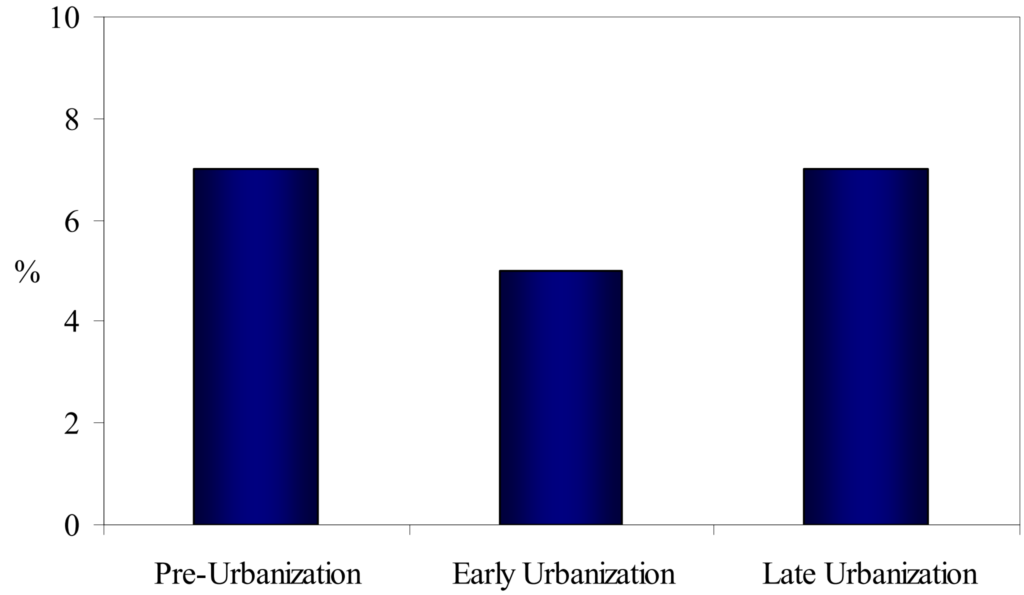

Figure 4.145. Percentage of adults with trauma

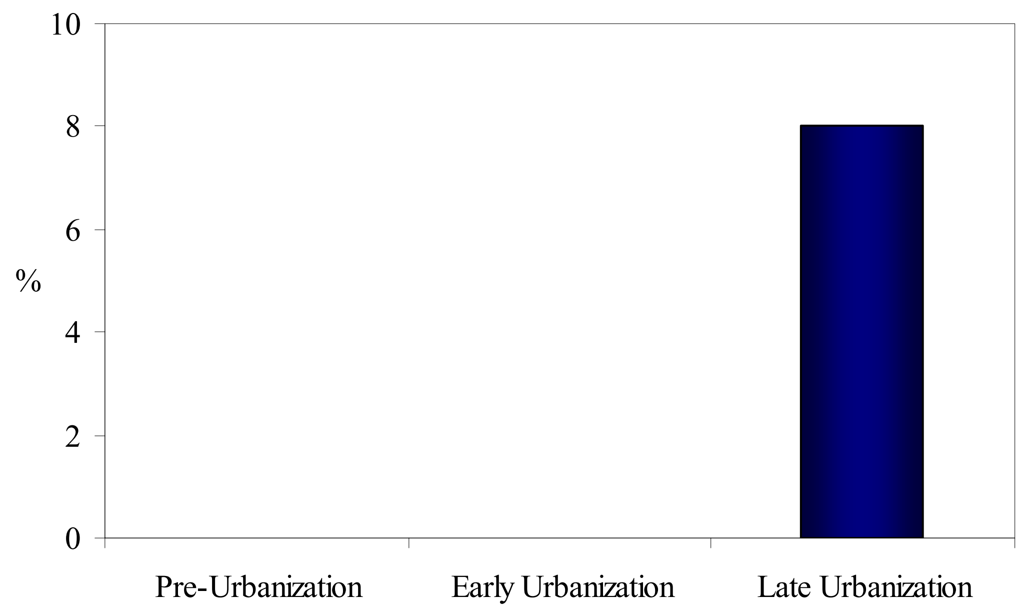

Figure 4.146. Percentage of adult females with trauma

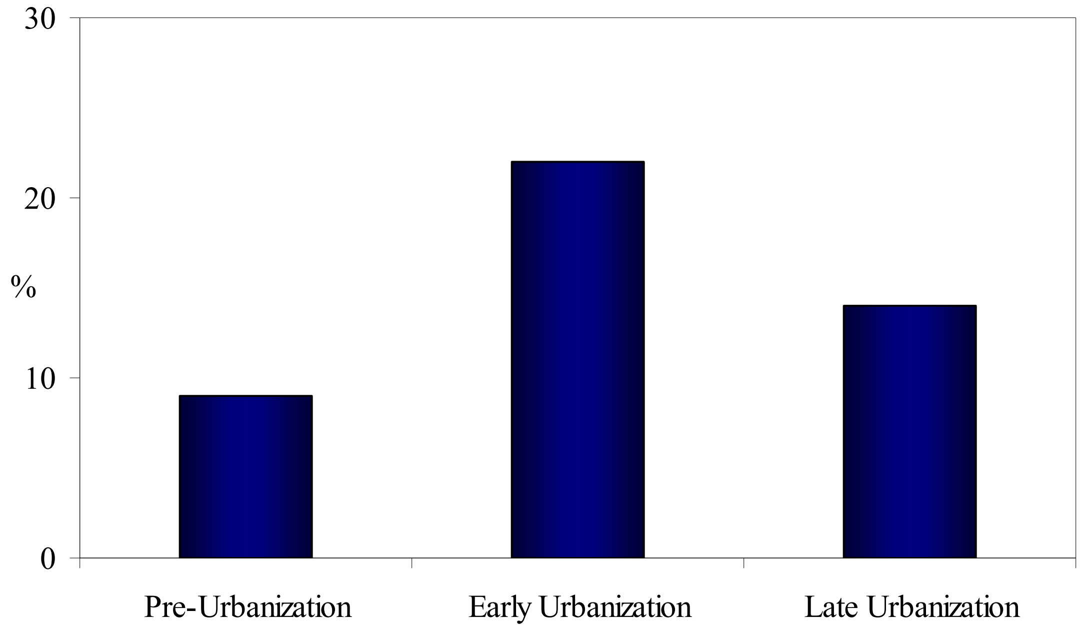

Figure 4.147. Percentage of adult males with trauma

Figure 4.148. Healed fracture of the left lateral portion of the frontal (Śródka, burial 43)

Figure 4.149. Healed fracture at midshaft of right radius and ulna (Śródka, burial 54)

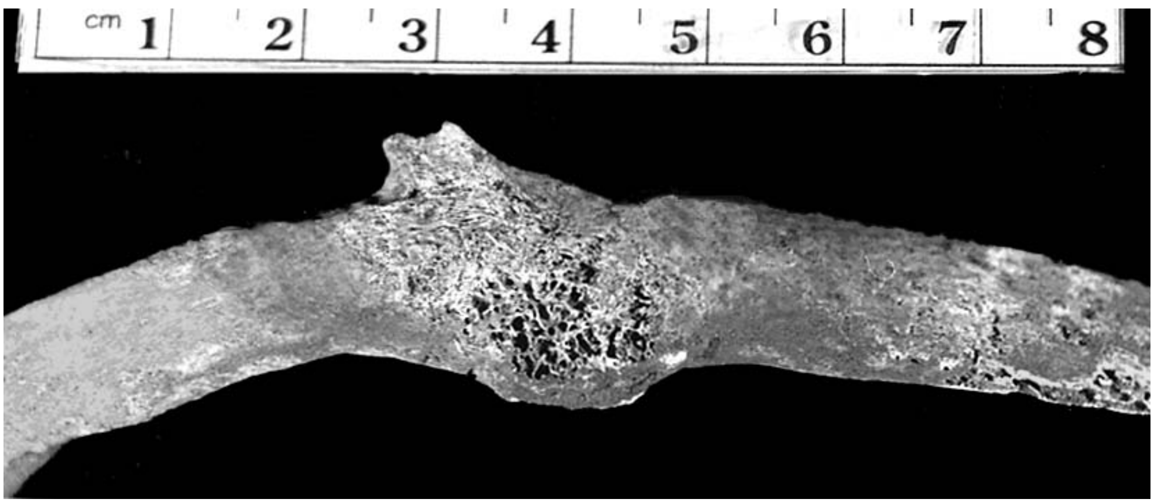

Figure 4.150. Partially healed fracture of right rib (Śródka, burial 108)

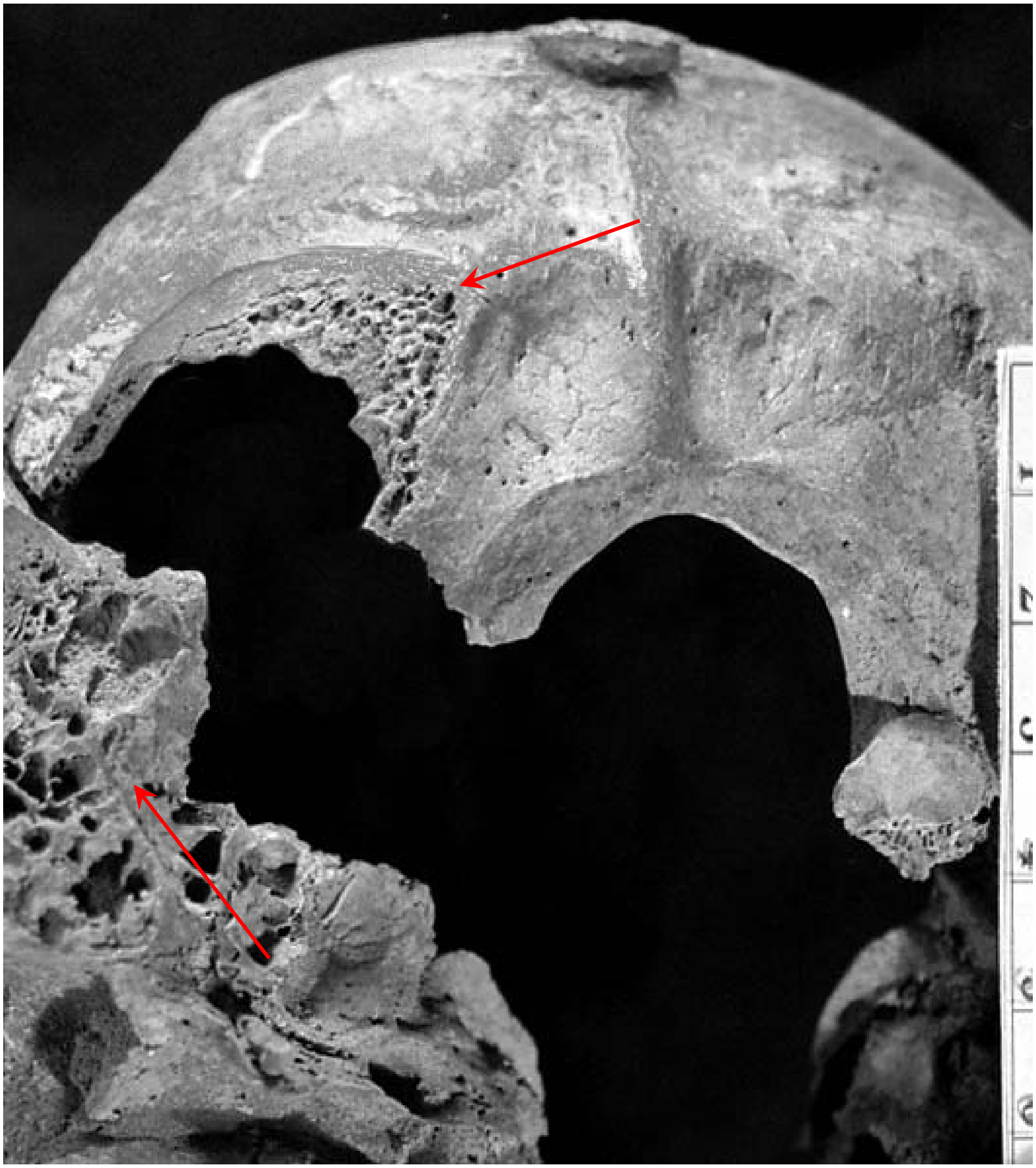

Figure 4.151. Traumatic fracture (arrows) of left basilar portion of cranium (Śródka, burial 38)

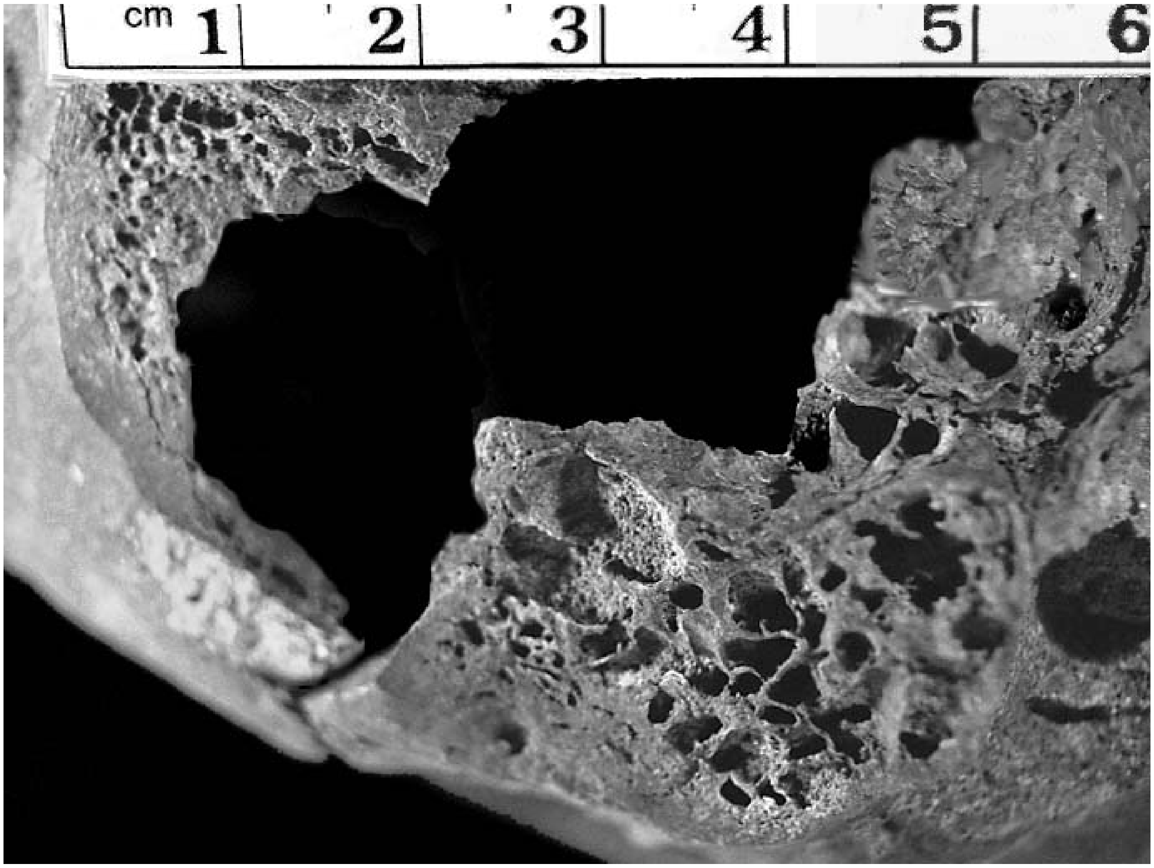

Figure 4.152. Close-up of traumatic fracture of left basilar portion of cranium (Śródka, burial 38)

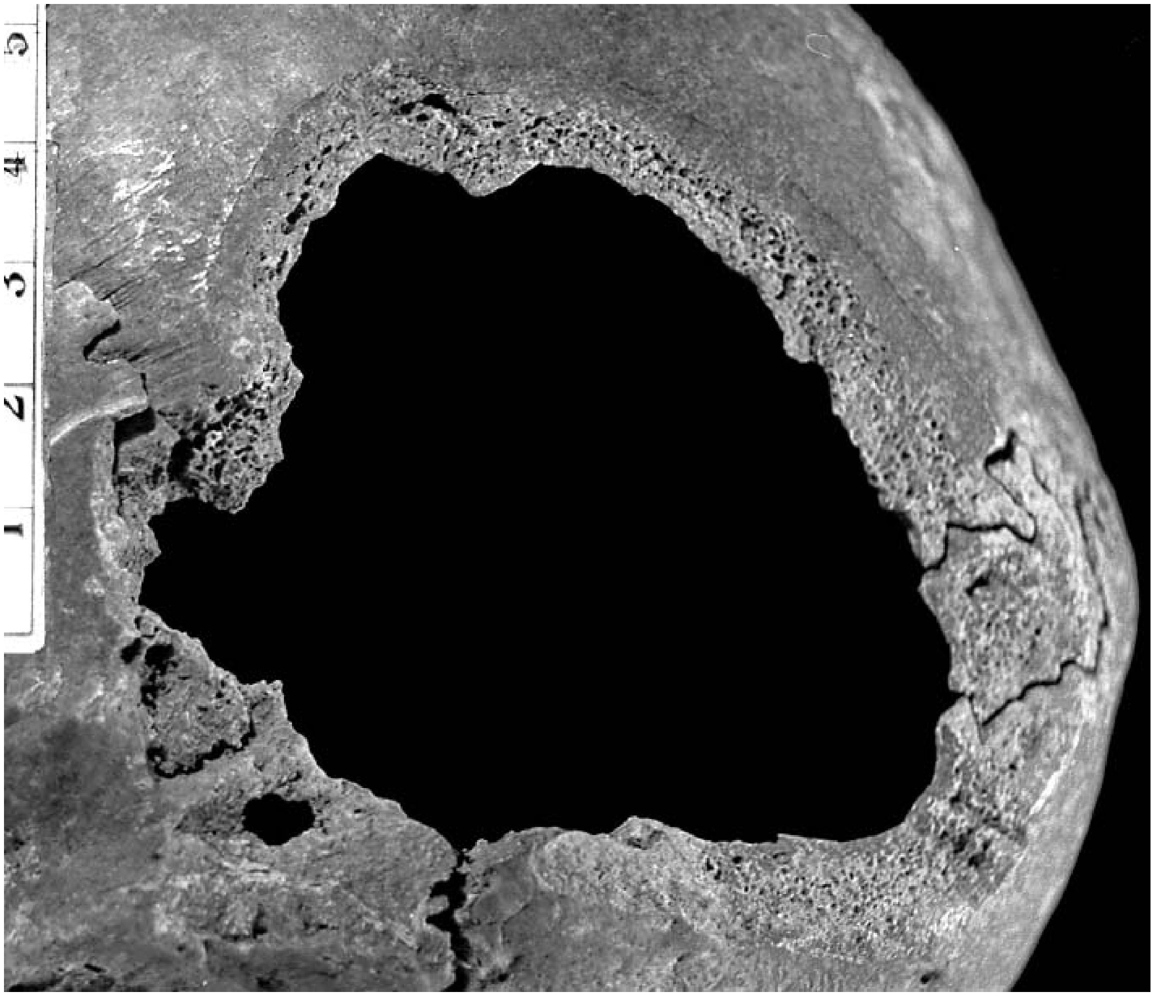

Figure 4.153. Traumatic fracture of left parietal and temporal (Śródka, burial 38)

mastoid process and the occipital bone surrounding the foramen magnum (Figures 4.151, 4.152). In addition, the latter blow affected the odontoid process of the second cervical vertebrae, with a small, shallow transverse cut present on the posterior aspect. This individual also has a shallow, transverse cutmark on the lateral surface of the right humeral shaft. Finally, there is one adult individual of undetermined sex from the pre-urbanization sample who has a healed fracture of the first phalanx of the left foot (Śródka, burial 128).

No subadults exhibit evidence of traumatic injury and, therefore have no significant temporal trend. Sex-based comparisons of the prevalence of trauma lack any significant differences in each of the three temporal samples (Figure 4.154, Table B.302). Likewise, there are no significant differences between adults and subadults in the prevalence of trauma in each of the temporal samples (Figure 4.155, Table B.303).

Summary

Temporal comparisons of the three samples reveal several significant trends. Among the systemic stress indicators, subadults had a significantly greater prevalence of cribra orbitalia than adults in the early urbanization sample. The overall trend suggests that over time, subadults have a greater prevalence of cribra orbitalia than adults. In terms of severity in the early urbanization sample, all adults have the severe form of cribra orbitalia, while the majority of subadults have the mild form. Porotic hyperostosis is only present in the mild form and does not show any significant temporal trends. Enamel hypoplasias, conversely, have a few significant trends. First, during the late urbanization, subadults have a greater prevalence of enamel hypoplasias than adults. Like cribra

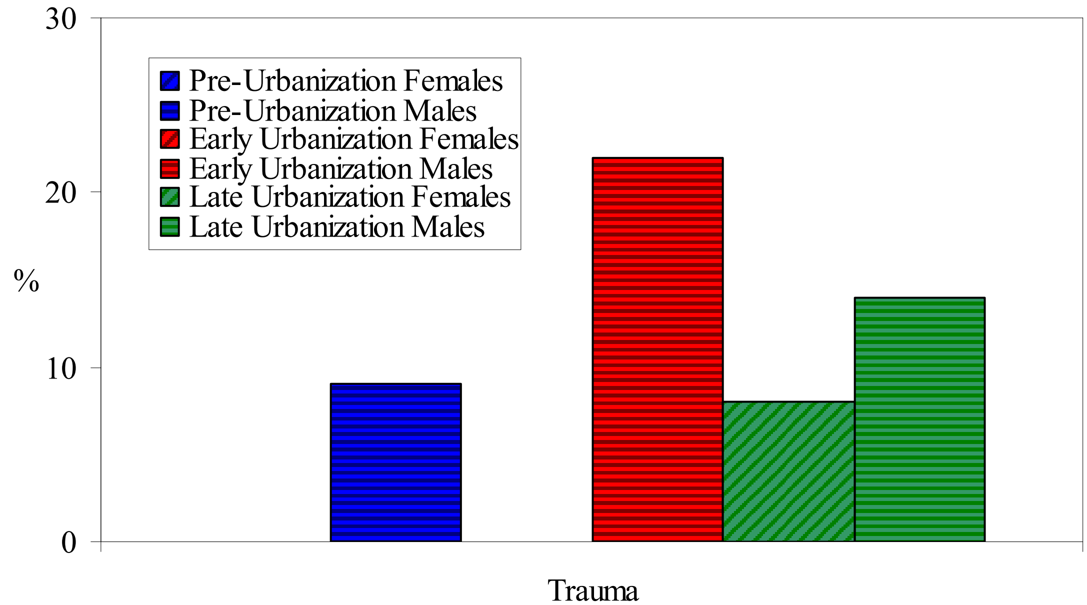

Figure 4.154. Sex-based comparison of percentages of adult males and females with trauma

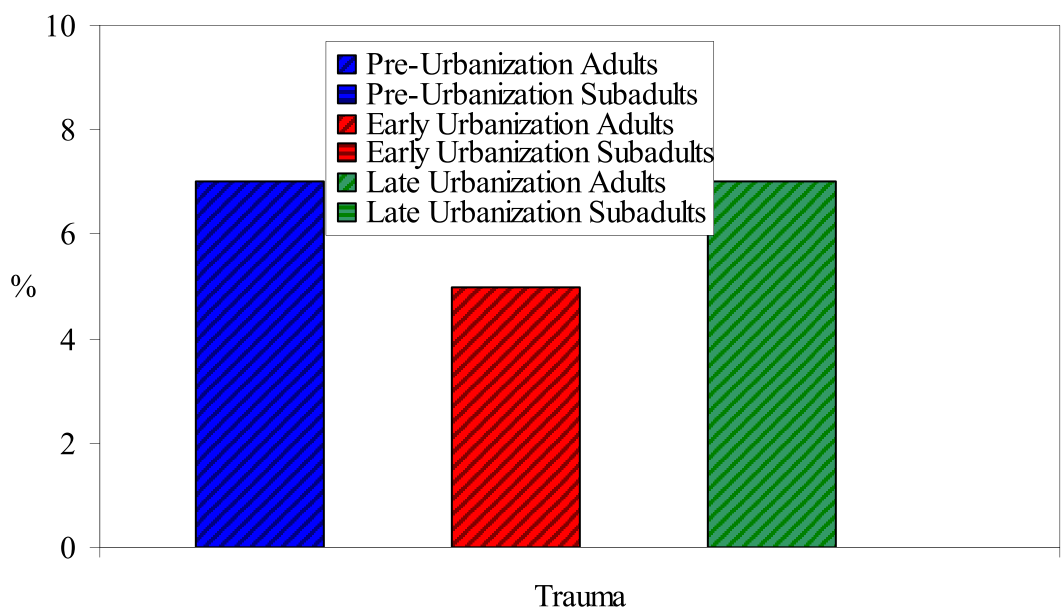

Figure 4.155. Age-based comparison of percentages of adults and subadults with trauma

orbitalia, the overall trend indicates that over time, subadults have a greater prevalence than adults. Temporal comparisons of severity of enamel hypoplasias reveal that the mandibular canine in females generally exhibits single hypoplastic defects in the early urbanization sample, but multiple defects in the pre-urbanization sample. No other significant trends were found for any sex or age cohort. In general, over time, subadults have a greater prevalence of systemic stress indicators than adults. The other comparisons, however, indicate that the various age and sex cohorts remain temporally consistent in terms of prevalence and severity of systemic stress indicators.

Temporal comparisons of the prevalence and severity of infectious diseases reveal a single significant trend for periostitis; however, there are no trends for specific infectious diseases, including treponematosis, tuberculosis, and leprosy. In the early urbanization sample, the majority of adults have level 2 severity of periostitis of the left tibia, while the majority of subadults have level 3 severity for the left tibia. Another trend approaches significance in the pre-urbanization and late urbanization samples, in which adults have a higher prevalence of periostitis than subadults. The early urbanization sample also has a greater prevalence for adults than subadults, but it is not statistically significant. Overall, the differences in prevalence of periostitis between adults and subadults decrease over time. However, the other comparisons indicate that the various age and sex cohorts remain temporally consistent in terms of prevalence and severity of periostitis and specific infectious diseases.

Among the dental pathological conditions, there are several significant temporal trends. In the early urbanization sample, adults have a significantly greater prevalence of dental caries of the molars than subadults. Likewise, during the pre-urbanization and early urbanization, adults have a significantly higher prevalence of antemortem tooth loss than subadults. In terms of severity of antemortem tooth loss (number of teeth lost), many of pre-urbanization adults have two teeth lost and none of them have five teeth lost. Conversely, in the late urbanization sample, many adults have five teeth lost, but none of them have two teeth lost. The prevalence of dental calculus also has a significant trend in the pre-urbanization sample. Adults have a greater prevalence of calculus than subadults; however, this trend does not continue in the later samples. The early urbanization and late urbanization samples do not exhibit significant differences in the prevalence of calculus between adults and subadults.

Finally, temporal comparisons of the severity of dental wear reveal multiple significant trends. For the left mandibular second molar, the majority of pre-urbanization adults have level 4 severity, while the majority of early urbanization adults have level 3 severity. In addition, many of the early urbanization adults have level 6 severity in contrast to the majority of pre-urbanization adults with level 4 severity. For the right mandibular second molar, the majority of pre-urbanization adults have level 4 severity, and the majority of early urbanization adults have level 3 severity. For the left and right maxillary first molars, the majority of early urbanization adults have level 8 severity, while the majority of late urbanization adults have level 4 severity. Among females, for the right mandibular second molar, the majority of pre-urbanization females have level 4 severity, and the majority of early urbanization females have level 3 severity. Finally, for the left mandibular first molar, the majority of pre-urbanization subadults have level 1 severity, while the majority of early urbanization subadults have level 2 severity. The overall trends for the dental pathological conditions indicate that the differences between adults and subadults in the prevalence of dental caries, antemortem tooth loss, and dental calculus diminish over time. However, there is a temporal increase in the number of teeth lost antemortem per individual among adults. In terms of dental wear, among adults and adult females, some of the mandibular molars show a temporal decline in severity of wear, while some of the maxillary molars show a temporal increase in severity of wear. Conversely, among subadults, one of the mandibular molars shows a temporal increase in severity of wear.

Temporal comparisons of adult stature did not reveal any significant trends. Adult males and adult females were considered separately, but no temporal differences existed for mean femoral lengths in the three samples. The lack of difference among the samples indicates that stature remained consistent over time.

Temporal comparisons of prevalence and severity of DJD reveal several significant trends for DJD by individual and by specific joints. For the left elbow and left wrist, the late urbanization males have a significantly higher prevalence of DJD than the early urbanization adults. In contrast, for the left and right hips, the pre-urbanization adults have a significantly greater prevalence of DJD than the early urbanization adults. The left elbow and right hip also reveal significant trends in adult females. The late urbanization females have a significantly higher prevalence of DJD of the left elbow than early urbanization adults, while pre-urbanization females have a significantly greater prevalence of DJD of the right hip than early urbanization adults. Lastly, in comparisons of males and females in the early urbanization sample, males have a significantly higher prevalence of DJD than females. In the pre-urbanization, males and females do not differ, and in the late urbanization, while there is no significant difference between males and females, the data suggest males have a greater prevalence of DJD than females. Overall, there are a few major trends in the prevalence of DJD. For adults and adult females, there is a temporal increase in the prevalence of DJD in the left elbow and wrist. Conversely, there is a temporal decline in the prevalence of DJD for the right and left hips. Furthermore, there is a temporal increase in sex-based differences in the prevalence of DJD.

Finally, temporal comparisons of the prevalence of trauma do not reveal any temporal trends. The overall prevalence of trauma is low for all sex and age groups, with males having the greatest prevalence, albeit not significantly. Four of the six cases of traumatic injury are males, one is female, and one is of undetermined sex. In addition, the case of traumatic injury that is clearly due to interpersonal violence is male, as well as the case of injury that may be due to interpersonal violence. The results suggest that it is predominantly males who exhibit traumatic injuries, particularly those of violent origin.

The temporal comparisons discussed in this chapter suggest several important trends among the three samples. These trends indicate that over time, some changes were taking place biologically in the medieval Polish population. The trends will be examined in more detail in the following chapter, which will assess whether they support or contradict the hypotheses put forth in chapter two.

CHAPTER 5

DISCUSSION

Although there have been few studies of the consequences of urbanization in Poland, bioarchaeological research of medieval skeletal samples has revealed evidence that suggests Polish populations were experiencing changing health during this period (e.g., Piontek et al., 2001; Kozak and Krenz-Niedbała, 2002; Piontek and Kozlowski, 2002, Kwiatkowska and Gronkiewicz, 2003). The results of this study further this notion, as there are a number of significant trends for various skeletal indicators of health and lifestyle that suggest the population in Poznań experienced stress and biological changes over time in conjunction with the urbanization trend. These results provide a number of insights into this population and enable some conclusions to be drawn regarding the effects of urbanization.

The following will discuss the results of the statistical analyses and attempt to explain them in terms of their biocultural context. That is, the results will be interpreted in light of what is known about medieval Poland and the population that inhabited the city of Poznań. The major trends will be assessed to determine whether they support or negate the four hypotheses of chapter two, and whether they can be used to address the major questions of this dissertation: what were the biological effects of urbanization and what was the nature of this impact?

Skeletal Indicators of Health: Systemic Stress

There are two major trends in systemic stress indicators among the three temporal samples. First, over time, subadults have a significantly greater prevalence of cribra orbitalia than adults. While adults maintain a temporally consistent rate of this stress indicator, subadults show an increase in prevalence from pre-urbanization to late urbanization. Although this increase in subadults is not statistically significant, the differences between subadults and adults is significant in the early urbanization sample. Together, these results suggest that with increasing urbanization, there is an increase in systemic stress. Cribra orbitalia is indicative of stress episodes during childhood; however, healed forms of this condition can be observed on adult remains as well (Stuart-Macadam, 1985). In particular, this stress marker can reflect periods of iron deficiency anemia resulting from malnutrition, blood loss, parasitic infection, or disease (Stuart-Macadam, 1989a, 1992b). The erosion of the outer compact bone of the eye orbits is more often observed in subadults, because their marrow cavities are filled and cannot accommodate the anemia-induced increase in red blood cell production (Stuart-Macadam, 1985). Adults, on the other hand, have more marrow cavity space available and thus, there is less impact on the bone of the orbits. Adults may exhibit healed lesions of cribra orbitalia, reflecting episodes of anemia that occurred much earlier in life (Larsen, 1997). The temporal trend of a greater prevalence of cribra orbitalia in subadults than in adults likely reflects a temporal increase in parasitic infection, disease, or malnutrition in association with changing urban environment. As urbanization increased, the population size grew and became more sedentary, leading to increases in accumulation of garbage and waste, as well as possible pollution of the water supply (McGrath, 1992; Storey, 1992). These negative sanitary conditions would have increased the population's exposure to infectious pathogens and to parasites, both of which may have lead to higher rates of anemia and an associated temporal increase in prevalence of cribra orbitalia in subadults. Water-borne parasites may have been especially problematic if the water supply did, indeed, become polluted (Cohen, 1989; Inhorn and Brown, 1990).

The lack of any temporal trends for porotic hyperostosis and the presence of only the mild form of this condition in all age and sex cohorts may be due to an overall milder form of anemia in the population. It is also important to note that the temporal increase in prevalence of cribra orbitalia did not correspond to an increase in severity for subadults or any other group. Both the severe and mild forms of this stress indicator were observed in all age and sex cohorts.

The second trend in systemic stress indicators is in the prevalence of enamel hypoplasias. Comparisons of subadults and adults reveal that over time, subadults begin to have a significantly higher prevalence of enamel hypoplasias than adults, further suggesting that increases in urbanization caused an increase in systemic stress. Although subadults show a temporal increase in prevalence, it is not statistically significant. Adults, by contrast, do not show any temporal change in the rates of enamel hypoplasias. Like cribra orbitalia, enamel hypoplasias are indicative of stress episodes during childhood (Goodman and Rose, 1990). This marker is a permanent record of growth arrest during the formation of the dentition and may result from malnutrition, disease, and, to a lesser extent, traumatic injury to the mouth or hereditary conditions (Goodman and Rose, 1990, 1991; Huss-Ashmore, 1992; Hillson, 1996, 2000). Unlike cribra orbitalia in which adults can show a healed form of the marker, enamel hypoplasias do not heal; adults and subadults can exhibit the hypoplastic defects. Regardless of the age of the individual skeleton, however, the presence of an enamel defect indicates there was a general metabolic insult that caused a temporary disruption in the formation of the tooth enamel. The general increase in enamel hypoplasia prevalence in subadults reflects a general increase in systemic stress during childhood. The problems associated with urbanization, such as poor sanitary conditions and pollution of the water supply would have created a higher pathogen load in the population, causing an increase in infection, which may have caused growth disruption (McGrath, 1992; Storey, 1992). Furthermore, problems of malnutrition may have also arisen during urbanization as the population size grew. The combination of malnutrition and disease may have increased with urbanization due to the changing environmental conditions and, likewise, caused increases in growth disruption as reflected in the greater rate of enamel hypoplasias.

In comparing the results from Poznań to other urban centers in Poland, a number of intriguing similarities and differences arise (Figure 5.1). Kwiatkowska and Grokiewicz (2003) studied skeletal remains from Wrocław, located in the southwestern part of the country. The dates of the skeletal series, A.D. 1100-1200, correspond to the late urbanization sample of this study (A.D. 1100-1250). Their results reveal that the prevalence of cribra orbitalia in adult males and adult females is 18% and 19%, respectively, which varies to a limited degree from that observed in the late urbanization adult males and adult females of this study (0%, 25%, respectively) (Figure 5.1). Additionally, Kwiatkowska and Grokiewicz found that the prevalence of enamel hypoplasias is 30% for adult males and 14% for adult females. In comparison, this study

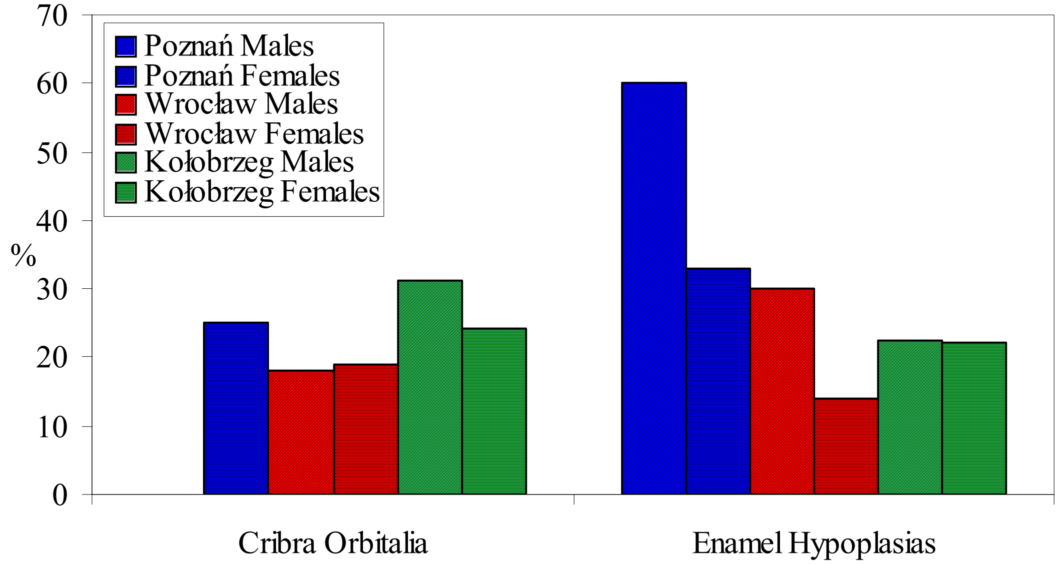

Figure 5.1. Comparison of stress marker prevalence for adult males and females

found somewhat higher prevalence rates of 60% and 33%, respectively. This comparison suggests that the apparent increase in systemic stress indicators in the Poznań samples corresponds somewhat to the level of stress at other urban centers in medieval Poland. It is especially interesting to note that while the prevalence rates for cribra orbitalia are rather similar between the two populations, the prevalence rates for enamel hypoplasias are approximately doubled in the Poznań samples. This higher prevalence of enamel hypoplasias may be due to a number of factors, including greater exposure to pathogens (other than parasites) or poorer nutrition (Goodman and Rose, 1990, 1991; Hillson, 2000). In addition, inter-observer error in the scoring methods for enamel hypoplasias may account, in part, for the difference in the rate of this stress marker for the two populations. The increased population size may have had detrimental consequences on the availability of and access to nutritional foods, leading to greater rates of malnutrition. As more people moved in to the city, the food supplies would have had to accommodate the increased population size and in some instances, it may have fallen short, leaving some portions of the population without adequate amounts of food. Subadults may have been especially sensitive to food shortages due to the energy demands associated with growth and development. When combined with increased exposure to pathogens through worsening sanitary conditions, the synergistic effect of malnutrition and disease may have caused an increase in growth disruption and an associated temporal increase in enamel hypoplasias (Scrimshaw, 1975; Scrimshaw et al., 1968). While Wrocław was undergoing an urbanization trend as well, it may not have yet reached the same population size and density as Poznań, thereby resulting in a lower prevalence of this stress indicator.

Comparison with results from Piontek and Kozlowski's (2002) study of cribra orbitalia in subadults reveals a different trend. The sample from Gruczno, located northeast of Poznań, is dated to A.D. 1100-1400, corresponding, in part, to the late urbanization sample of this study. While Piontek and Kozlowski note a prevalence of 86% for the subadult sample of Gruczno, this study found a 36% prevalence rate for cribra orbitalia in subadults from Poznań. The substantially higher rate in the Gruczno population may reflect an even greater pathogen load or more widespread and intense malnutrition, both of which can lead to hypoplastic defects (Goodman and Rose, 1990, 1991; Hillson, 2000). Additionally, the Gruczno cemetery was in use until A.D. 1400, much later than the terminal date of the late urbanization sample included here. As urbanization is expected to have continued and intensified, the Gruczno population may reflect a further, more severe decline in health, as the problems of urbanization, including poor sanitation, pollution of the water supply, and great accumulations of garbage would have intensified along with urbanization.

Kozak and Krenz-Niedbała's (2002) study of the population from Kołobrzeg, Poland, offers contrary evidence (Figure 5.1). The population of the city (A.D. 1300-1700) lived on the Baltic Sea, north of Poznań. Kozak and Krenz-Niedbała found a cribra orbitalia prevalence rate for adult males and adult females of 31.1% and 24.2%, respectively, compared to the 0% and 25% rates, respectively, observed in the late urbanization sample of this study (Figure 5.1). While the females have a similar prevalence, males from Kołobrzeg have a substantially higher prevalence rate than males from Poznań. Like the Gruczno population, the Kołobrzeg population was considerably later in the urbanization trend and may reflect further increases in systemic stress in conjunction with intensification of urbanization. However, the prevalence of enamel hypoplasias in the Kołobrzeg population is lower than that observed in the Poznań population. Kołobrzeg adult males have a prevalence rate of 22.6% and adult females have a rate of 22.2%, while adult males and females from Poznań have rates of 60% and 33%, respectively. Again, these differences may be partly due to inter-observer error. However, the opposite trends observed for the two systemic stress markers may reflect differing types of stress in the two populations. As Kołobrzeg is located on the Baltic Sea, the medieval population would have had access to an ample and regular food supply, reducing rates of malnutrition. In addition, with proper nourishment, individuals' immune systems would have been better able to ward off pathogen infections, thereby decreasing the hypoplastic defects reflecting growth arrest. However, if the population consumed raw fish from the nearby Baltic, they would have been at greater risk for parasitic infections, which can lead to anemia (Walker, 1986). The Poznań population, on the other hand, may not have had such a regular and reliable food supply, resulting in periodic nutritional stress and reduced resistance to infections.

One major trend for the Poznań samples is that systemic stress increased temporally in conjunction with increasing urbanization. It is likely that this stress increase is the result of the poor sanitary conditions associated with increasing urbanization. As the population increased in size and became more sedentary, the sanitary conditions worsened, likely leading to pollution of the water supply. With greater exposure to pathogens, including parasites, the population experienced greater stress, as reflected in the greater prevalence rates of the systemic stress indicators. However, the indicators employed here reflect only childhood stress. Furthermore, systemic stress provides only one aspect of community health. In order to determine whether there was an overall decline in health, it is necessary to examine other indicators of health, including infection and diet.

Skeletal Indicators of Health: Infection

There are a few major trends in the prevalence and severity of periostitis and specific infectious diseases. For periostitis, in general, adults have a higher prevalence than subadults. While this trend is not statistically significant, each temporal sample has the same result. The greater prevalence of periostitis in adults, may suggest that while subadults were experiencing greater systemic stress over time, adults, overall, were experiencing a different type of stress than subadults regardless of temporal period. Since periosteal reactions may result from bacterial infections or trauma, it is possible adults were exposed to more or different infectious pathogens or they experienced more trauma than subadults (Ortner, 2003; Roberts and Manchester, 2005). Alternatively, adults may have a higher prevalence rate because for many, periostitis was a chronic condition due to their lifelong exposure to pathogens resulting from poor sanitary conditions.

There is another trend in the severity of periostitis. In the early urbanization sample, the majority of adults have level 2 severity for the left tibia, while the majority of subadults have level 3 severity. Although not significant, a similar result occurs in the late urbanization, in which the majority of adults have level 2 severity for the left tibia, and half of the subadults have level 3 severity. This same tendency is also noted for the right tibia in the early urbanization and post urbanization samples, albeit not statistically significant. This trend suggests that while adults have a higher prevalence of periostitis overall, subadults have greater severity for the right and left tibiae in the early and late urbanization samples. Subadults may have had more acute infections because they are highly susceptible to certain infections, such as weanling diarrhea during the early years of life. Adults, on the other hand, may have had more chronic periosteal infections as a result of continued exposure to pathogens during their lives.

There were no significant trends noted for specific infectious diseases. There is evidence of leprosy in each temporal period, but in all cases, only adults were affected. This, however, is to be expected, as leprosy requires prolonged exposure in order to transmit the pathogen, and there is often a long latency period of several years before symptoms of the disease are expressed (Ortner, 2003). As a result, adults would predominantly exhibit evidence of leprosy. The lack of temporal trend for leprosy or any of the other specific infectious diseases suggests that leprosy was endemic to the population to a certain degree as it appears to be present in each period at a low rate. However, it is important to note that many cases of leprosy, treponematosis, and tuberculosis do not involve the skeleton. In fact, only 5% of individuals with leprosy develop the skeletal markers (Ortner, 2003). It is possible that leprosy did increase, but those who contracted it died before the skeleton was affected, especially if they were more vulnerable due to other sources of stress, such as malnutrition or parasitic infections. Despite this, though, the lack of temporal increase in periostitis, which is a general indicator of bacterial infection, suggests that specific infectious diseases were also likely to have remained consistent over time.

In comparing the results of infection from the Poznań samples to other medieval European skeletal samples, a variety of results are noted (Figure 5.2). In a medieval (A.D.

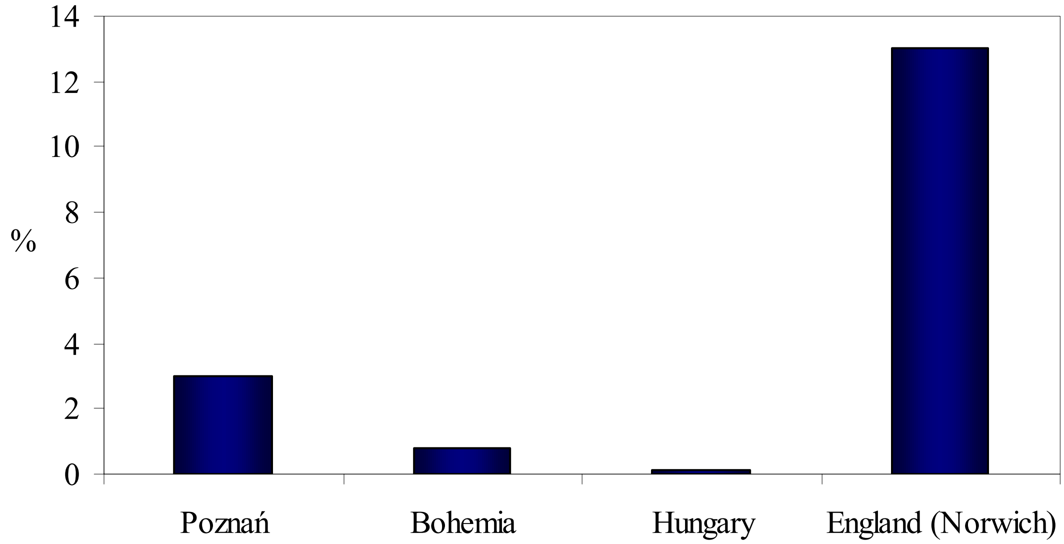

Figure 5.2. Comparison of leprosy prevalence for total sample

1050-1120) collection from Bohemia, skeletal evidence of leprosy was found in 0.8% of the total sample, while in the total sample from Poznań, 3% have skeletal lesions consistent with leprosy (Likovský et al., 2006) (Figure 5.2). Similarly, a 10th century Hungarian skeletal collection has evidence of leprosy in 0.1% of the individuals (Marcsik and Pálfi, 1999) (Figure 5.2). The similar low prevalence rates for these populations may be due to the temporal period. In Europe, particularly Western Europe, leprosy had its highest incidence in the 12th to 13th centuries (Lechat, 2002). Although leprosy epidemics were most common in Western and Southern European countries, Eastern and Central Europe were affected (Dokládal, 2002). The prevalence rates for the populations from Bohemia, Hungary, and Poznań may be low because, with the exception of the late urbanization period in Poznań, they are dated to periods prior to the greatest leprosy epidemics. In many countries, particularly in Western and Southern Europe, during the height of leprosy, the prevalence was considerably greater than what is observed in the Poznań samples. For example, a 12th-15th century cemetery from Norwich, England has evidence of leprosy in 13% of the skeletal remains (Anderson, 1998) (Figure 5.2). In a medieval (A.D. 1150-1350) Danish cemetery, 26% of adults were affected by leprosy, compared to 5% of adults in the Poznań samples (Boldsen, 2005). However, these high rates are not always consistent. In an overview of research conducted on skeletal collections in England, Roberts (2002) notes that during the 12th to 19th centuries, approximately 2% of the population was affected by leprosy. This unexpectedly low rate, however, may be due to the inclusion of substantial skeletal remains from post-13th century, resulting in an overall lower prevalence of leprosy.

The major trend for periostitis is that adults had a greater prevalence than subadults, while subadults had more severe periostitis of the tibiae. This trend may be a function of the types of pathogens to which adults and subadults were exposed. The more acute infections in subadults, as evidenced by the greater rate of severe infections of the tibiae, may be due to weanling diarrhea or other such conditions. Alternatively, adults may have had more mild, but chronic infections due to continued exposure to pathogens throughout their lives as well as to traumatic injuries. The unsanitary living conditions, pollution of the water supply, and large population size all likely caused bacterial infections in the population. The lack of change in the prevalence of specific infectious diseases, including leprosy, may be the result of the temporal period. The major epidemics of leprosy occurred in the 12th and 13th centuries, and most evidence of these is in Western and Southern Europe (Dokládal, 2002; Lechat, 2002). It is possible that increased prevalence rates of leprosy occurred later in Poland. Additionally, while large population sizes enable the spread of communicable diseases, it is also possible that the population in Poznań had yet to reach a critical mass at which the living conditions became overcrowded and the spread of such diseases was greatly increased (Cohen, 1989; Inhorn and Brown, 1990).

The evidence of infection, including periostitis and leprosy, indicates that both were present in the population. While there are no temporal trends discernable in these samples, their presence reflects general health problems both before and after urbanization. Poor sanitary conditions and pollution of the water supply likely account for the prevalence of periostitis. While infection and systemic stress indicators provide insight into the health of the Polish population, they do not offer a complete picture. In order to further assess community health during this critical period, it is essential that evidence of diet be examined as well.

Skeletal Indicators of Health: Diet

Dental pathological conditions have several major trends for the three temporal samples in this study. Adults have a significantly higher prevalence of carious lesions in the molar than subadults in the early urbanization sample. While the pre-urbanization and late urbanization samples do not have statistically significant results, the same pattern is found throughout. However, this trend may simply be the result of age differences (Rowe, 1982; Powell, 1985). Variation in prevalence of caries can be related to age, as the permanent teeth of adults have a much longer period of exposure to cariogenic foods than subadults; therefore, they have a higher risk of developing carious lesions. As a result of this, the differences observed between adults and subadults are likely due to age rather than dietary differences. No other trends are found for the prevalence of carious lesions, as all age and sex cohorts maintain a consistent rate of dental caries in terms of the individual and the tooth class. The lack of temporal trends in the severity of dental caries, in terms of number of carious lesions per individual and size of lesion, also supports the notion that dental caries remained constant for adults of both sexes and subadults regardless of period. Overall, this points to a temporally consistent diet.

Antemortem tooth loss exhibits some differences from dental caries. In the pre-urbanization and early urbanization samples, adults have a significantly greater rate of antemortem tooth loss than subadults. The same pattern in found in the late urbanization sample, although it is not statistically significant. This, like dental caries, may be a function of age, as teeth may be lost as part of aging through super-eruption (Larsen, 1997). However, the severity of antemortem tooth loss, in terms of number of teeth lost, demonstrates a potential trend. Over time, the number of teeth lost in adults increases. Many of pre-urbanization adults have a total of two teeth lost antemortem, and none of them have a total of five teeth lost. In contrast, many of the late urbanization adults have a total of five teeth lost, but none of them have a total of two teeth lost antemortem. While this is the only significant result, it suggests a temporal trend for increasing number of teeth lost antemortem among adults. Among pre-urbanization adults, with few exceptions, most of individuals with tooth loss have lost between one and three teeth. In the early urbanization, all of the adults have lost between one and nine teeth. Finally, in the late urbanization, most adults have lost between one and five teeth, and two individuals have lost thirteen or more teeth. This trend contradicts what is found in dental caries, as the pattern of severity of antemortem tooth loss suggests that there was some type of dietary change for adults in conjunction with urbanization.

The prevalence of periapical lesions does not show any trend among the age and sex cohorts. Like dental caries, there is no temporal increase or decrease, as periapical lesions remain at a constant rate over time. Likewise, the severity of periapical lesions, in terms of number of lesions per individuals, also lacks any significant trends as adults, adult males, adult females, and subadults exhibit temporally consistent levels of periapical lesions. Like dental caries, this evidence suggests that there was no dietary change for adults or subadults.

The prevalence of dental calculus however, does show a significant trend. In the pre-urbanization sample, adults have a significantly higher prevalence of calculus than subadults. In the early and late urbanization samples, on the other hand, the prevalence rates are quite similar for adults and subadults. This change in dental calculus may or may not be related to diet. Since there are many etiological factors that lead to the accumulation of dental calculus (Hillson, 1996), it is not clear whether this trend in dental calculus is a function of diet.

Dental wear also has some significant trends. In adults and adult females, there is a decline in the severity of wear for the mandibular second molars, as the majority of pre-urbanization adults and adult females have level 4 severity, while the majority of early urbanization adults and adult females have level 3 severity. The same trend is noted in the maxillary first molars of adults, in which the majority of early urbanization adults have level 8 severity, but the majority of late urbanization adults have level 4 severity. These changes in the severity of dental wear suggest that there were some shifts in the types of foods being consumed, as the molars became less severely worn. Subadults, on the other hand, have a different trend as the mandibular molars became more severely worn over time. All the pre-urbanization subadults had level 1 severity for the left mandibular first molar, while the majority of early urbanization subadults had level 2 severity. This slight change in severity of wear may further indicate a change in diet.

Together, some of these dental conditions indicate that there may have been some change in the diets of subadults, leading a slight increase in dental wear of the mandibular molars. In addition, there may have been a change in the diets of adults causing a greater amount of tooth loss per individual over time as well as a decrease in dental wear. Although there may not have been significant trends for dental caries or periapical lesions, these few trends in antemortem tooth loss and dental wear indicate that dietary change was happening at least to some degree. The lack of change in dental caries prevalence and severity may indicate that the cariogenic nature of the diet did not change. In other words, the amount of carbohydrates did not increase or decrease. However, the changes in dental wear may indicate a softening of foods consumed, causing less abrasion and attrition. This evidence in conjunction with the skeletal indicators of systemic stress and infection suggest that there were changes occurring in the community health. To gain a final perspective on overall health, the stature of the temporal samples must be taken into account.

Skeletal Indicators of Health: Stature

The mean femoral lengths of adult males and adult females suggest that there are no temporal changes in stature. This consistency in femoral lengths indicates that any changes in health that were occurring were not severe enough to affect adult stature. However, it is important to note that only a few adult females and adult males could be measured. In females, there were only five, seven, and eight individuals measured for the pre-, early, and late urbanization samples, respectively. It is possible that with a greater sample size, a change in mean femoral length will be detected. For the males, there were six, eight, and one individuals for the three temporal samples, respectively. The late urbanization had to be excluded, because there was only one measurable adult male in the sample. Any changes in stature that took place between the early and late temporal periods would not be detectable from these samples. While adult stature is a good proxy for overall health of a population, the lack of change in mean femoral length does not preclude any changes in health (Goodman et al., 1988; Steckel, 1995). It is quite possible that health did change, but that stature did not. Moreover, if stress was experienced for only some of the subadult years, individuals may have had catch-up growth, enabling them to attain full adult stature (Lewis, 2007).

A comparison of stature estimates for medieval and modern Poles reveals some important similarities and differences. Using the Trotter and Gleser (1952) stature estimates for American white males (in Bass, 1995), pre-urbanization males have a mean stature of 170 cm, while early urbanization males have a mean stature of 172 cm. A study of four successive cohorts (1965, 1976, 1986, 1995) of modern Polish male conscripts (19 years of age) found that stature increased over time (Bielicki and Szklarska, 1999). The four cohorts had mean stature values of 170.5 cm, 173.1 cm, 175.3 cm, and 176.9 cm, respectively. A second study (Bielicki et al., 2005) of Polish male conscripts in a 2001 cohort found a mean stature of 177.5 cm, reflecting the continuing secular trend in height. The stature estimates for medieval Polish males from both the pre-urbanization and early urbanization samples coincide with the mean stature for the 1965 cohort, but are substantially less than the stature values of the later cohorts. This result suggests that the greatest increase in stature for Polish males has occurred over the past 40 years.

Similar results were found for the comparison of medieval and modern Polish females. Using the Trotter and Gleser (1952) stature estimates for American white females (in Bass, 1995), pre-urbanization females have a mean stature of 155 cm, early urbanization females have a mean stature of 159 cm, and late urbanization females have a mean stature of 157 cm. A study of 17-18 year old Polish females in four successive cohorts from 1967, 1977, 1987, and 2001 found mean stature values of 159 cm, 161 cm, 162 cm, and 164 cm, respectively (Łaska-Mierzejewska and Olszewska, 2005). Like males, the stature estimates of medieval females from all three samples are most similar to the 1967 sample and are somewhat less than the stature values of the later cohorts. Again, this suggests that substantial changes in stature for Polish females have occurred during the past 40 years. Together, stature comparisons of medieval and modern Polish males and females indicate that while health may have changed with urbanization, it may not be reflected in stature, as the medieval stature estimates are comparable to observed stature in the 1960s.

Skeletal Indicators of Lifestyle: Activity Patterns

There are a number of significant trends in the prevalence of DJD. In adults, there is a temporal increase between the pre-urbanization and late urbanization samples in the prevalence of DJD for the left elbow and left wrist. Conversely, between the pre-urbanization and early urbanization samples there is a temporal decrease in the prevalence of DJD for the right and left hips. These results are mirrored in the adult females, who exhibit a significant temporal increase in the prevalence of DJD in the left elbow and a significant temporal decrease in the prevalence of DJD in the right hip. While not significant, the same pattern is also noted for the left wrist and left hip. Adult males could not be assessed for changes in the left wrist and left elbow, as no male skeletal remains were found with these areas preserved. The temporal decrease in the prevalence of DJD in the hips, however, is also found in the adult males, albeit not statistically significant.

These trends indicate that the activity patterns were changing in conjunction with urbanization. The increase of DJD in the left elbow and left wrist suggests that there was greater use of the left arm in the later periods. Moreover, it is possible that before urbanization, much of the activity using the upper limbs was one-sided, while after urbanization began, activities required the use of both arms. Since the majority of people are right-handed, it would be expected that the prevalence of DJD for the right arm joints would remain the same, because the right arm would be in use regardless of whether the activity was one handed or required both hands. The shift to activities involving both hands would cause a resulting increase in DJD of the left arm joints, but not in the right arm joints.

The temporal decrease in DJD of the right and left hips of adults also reflects a change in activity patterns. Since the change occurs in both the right and left sides, it may reflect an overall decrease in mobility. The temporal decrease of DJD in the right hip is only significant in adult females; however, the same pattern is observed in males, indicating that both males and females experienced a decrease in mobility. This decrease in mobility may reflect the even greater sedentary nature of life in urban centers.

In addition to the changes to specific joints, there is a significant temporal trend in the prevalence of DJD for individuals. In the pre-urbanization sample, males and females have nearly identical prevalence rates of DJD. During the early urbanization, adult males have a significantly greater prevalence of DJD than adult females. This trend continues in the late urbanization sample as males have a greater prevalence of DJD than females; however, in this last sample the male-female difference is not statistically significant. Overall, this suggests that over time, males began to have a greater prevalence of DJD than females, in conjunction with the changes in activity patterns associated with craft specialization. Although not significant, adult males do show an increase in the prevalence of DJD between the pre-urbanization and early urbanization samples, reflecting the change in activity patterns for males. While females also likely experienced a change in activity patterns, it may not have caused a corresponding increase in the overall prevalence of DJD. This difference between males and females is probably a reflection of a sexual division of labor. With craft specialization, males were likely performing specific tasks routinely, such as would be expected with a wheelwright, a blacksmith, a metallurgist, or others. This repetitive type of activity can rapidly lead to degenerative changes in the joints and may have resulted in more individuals experiencing DJD. In contrast, while agricultural pursuits were also physically demanding and rigorous, there may have been a greater variety in activities. Although males engaged in agricultural pursuits also developed DJD, it may have taken longer, as they were not performing the same repetitive tasks on a daily basis.

In contrast to the significant trends in the prevalence of DJD for individuals and for specific joints, there were no such trends found for the severity of DJD for specific joints. In addition, when age cohorts for adult females and adult males were taken into account, no significant trends emerged. This, however, may be a result of the small sample sizes, which in most cases fell below five individuals. It is possible that there were changes in the severity of DJD for certain joints, but the small sample sizes prevented these from being observed. Analysis of the pattern of DJD also lacked any significant trends as the three temporal samples showed similar patterns of joint involvement. This lack of change in the pattern of DJD suggests that the same joints were being affected in both agricultural activities as well as activities of craft specialization. However, the change in prevalence rates for specific joints indicates that although the same joints may have been used, they were not affected to the same degree after craft specialization was adopted.

Together, the significant trends of the prevalence of DJD indicate that there were changes in activity patterns for the newly urbanized population. Joints of the left arm increased in DJD, while DJD of the right and left hips decreased. The changes in the left arm likely took place in conjunction with the new range and types of activities taking place in the urban environment. Activities of craft specialization would have been, in many cases, substantially different from those of agriculture. In addition, while farmers performed a number of activities throughout the year, craft specialists typically worked at a specific task on a daily basis. This change in activity pattern is reflected in the changes observed in DJD, especially for males who begin to have a greater prevalence of DJD than females. The change in DJD of the hips may not be directly associated with subsistence activities. Instead, the decrease in degenerative changes may simply reflect a decrease in mobility.

In addition to activities of craft specialization, males were also required to perform a military service (Gieysztor et al., 1968; Davies, 1982). As such, they were exposed to great risks of traumatic injury and death. Trauma, then, must also be considered in any assessments of health and lifestyle.

Skeletal Indicators of Lifestyle: Trauma

There are no statistically significant trends for traumatic injuries among the three temporal samples. However, some possible patterns do emerge. First, all traumatic injuries were sustained by adults; no subadults exhibited any evidence of fractures. Since adults were involved in subsistence activities with risks of injury both before and after urbanization, it would be expected that adults would experience the majority of traumatic injuries. This result also corresponds to the results of a study of urban and rural subadults in medieval and post-medieval England (Lewis, 2002). In this study, none of the subadults from the medieval urban sample exhibited evidence of traumatic injuries, although subadults from the rural and post-medieval samples did. The lack of evidence of traumatic injuries in subadults, however, may be due to so-called greenstick fractures that heal quickly and leave little, if any, evidence on the skeleton (Lewis, 2002).

In comparing males and females, only one female had evidence of trauma, while four males exhibited traumatic injuries. One individual of undetermined sex also had evidence of trauma. This potential trend supports the notion that males were at greater risk of injury during urbanization especially due to their required military service (Gieysztor et al., 1968; Davies, 1982). Moreover, only males exhibited injuries from a violent or potentially violent source. For instance, the individual that was decapitated (Śródka, burial 38) was male. Although these trends are not statistically significant, they fit expected patterns for adults versus subadults and males versus females. Overall, the prevalence of trauma was low, representing only about 3.6% of the total sample size and 6.3% of adults. Trauma, therefore, did play a role in the health and lifestyle of this medieval Polish population; however, it only affected a small portion of the population.

Addressing the Hypotheses

Hypothesis 1

According to hypothesis 1, health changed gradually, as systemic stress indicators and infection increased, while adult stature decreased. Analysis of the prevalence and of systemic stress supports this hypothesis to a limited degree. While there is evidence of increased stress for subadults in conjunction with urbanization, rates of periostitis and infectious disease remain constant for all age and sex groups. In addition, mean femoral length does not change among the three temporal samples for females, and it remains constant for males in the first two temporal samples. Overall, it appears that there was some change in health status as subadults had an increased level of systemic stress. However, the lack of a statistically significant change in severity of stress indicators and in the prevalence and severity of periostitis suggests that this health change was not severe.

Hypothesis 2

According to hypothesis 2, diet did not change as oral health and patterns of tooth wear remain constant among the three temporal samples. This hypothesis is refuted to a limited degree. While the pattern and prevalence of dental caries and periapical lesions show no temporal trends and, therefore, support this hypothesis, evidence from antemortem tooth loss and dental wear suggests that some dietary change did take place. For adults, there is an increase in number of teeth lost per individual. Dental wear severity declined for most teeth in adults and increased in mandibular second molars of subadults. The lack of change in dental caries suggests that whatever change did occur, did not affect the amount of carbohydrates or other cariogenic foods in the diet. It is possible that the dietary change that took place involved a softening of foods, which would cause less wear of the teeth.

Hypothesis 3

Hypothesis 3 states that activity patterns changed with urbanization, as the pattern, prevalence and severity of DJD changed. This hypothesis is supported, as the left elbow and left wrist show an increase in prevalence of DJD, while the right and left hips show a decrease in DJD prevalence. Together, these suggest that there were changes in activity patterns, as the left arm began to be used to a greater degree and the legs were used to a lesser degree, the latter probably in conjunction with a decrease in mobility. In addition, males show an increase in the prevalence of DJD, which is absent in females, likely reflecting a sexual division of labor. The lack of change in severity, however, indicates that when the joints were in use, they were affected to the same degree. In addition, the consistency in the pattern of joint involvement suggests that overall the same joints were in use after the change to craft specialization, and the prevalence rates for specific joints also did change.

Hypothesis 4

Hypothesis 4 states that interpersonal violence increased with urbanization as the level of traumatic injury increases among the three temporal samples. This hypothesis is refuted, as there is no temporal change in the prevalence of trauma. Males do show a greater prevalence than females, albeit not significantly, and all cases of trauma from violent or potentially violent causes are male. The overall consistent rate of traumatic injury suggests that both before and after urbanization, there was risk of injury, including injuries from interpersonal violence.

Summary

There are several major trends that result from the temporal comparisons of the prevalence and severity of the skeletal markers and pathological conditions. Among the systemic stress indicators, subadults show a significantly greater prevalence of cribra orbitalia than adults in the later temporal samples. This increase in cribra orbitalia in subadults, while not statistically significant, suggests that systemic stress increased with urbanization. It is likely that the poor sanitary conditions associated with urbanization, including accumulation of garbage and waste and pollution of the water supply increased the population's exposure to infectious pathogens and parasites, both of which may have led to greater anemia and, therefore, a higher prevalence of cribra orbitalia.

Subadults also exhibit a significantly higher prevalence of enamel hypoplasias than adult in the later temporal samples. Although the increase in this stress marker among subadults is not significant, the pattern indicates that in conjunction with urbanization, there was an increase in systemic stress leading to growth disruption. Malnutrition resulting from an ever-increasing population size and possibly inadequate food supplies during some periods may have lead to growth disruption. Poor nutrition in combination with exposure to infectious pathogens would have only heightened this problem, creating periodic episodes of growth arrest, leading to higher rates of enamel hypoplasias.

Periostitis and specific infectious diseases, especially leprosy, were present in the population during all temporal periods. Although there are no temporal increases in leprosy, its presence in the population reflects general community health issues both before and after urbanization. While there are no statistically significant trends for periostitis, there are two notable patterns that emerged. In general, adults have a greater prevalence of periostitis than subadults, which may be due to adults having had chronic infections from continued exposure to pathogens as well as from traumatic injuries. The poor sanitary conditions associated with urbanization likely contributed to lifelong pathogen exposure. The other general pattern for periostitis suggests that subadults had more acute infections than adults, especially involving the tibiae. This pattern is likely the result of the susceptibility of subadults to more severe infections, such as weanling diarrhea. Again, pollution of the water supply and unsanitary living conditions may have been responsible for this pattern.

Dental indicators of diet together suggest that there may have been some change in diet associated with urbanization. Among subadults, there is a slight increase in dental wear severity of the mandibular molars. Adults, on the other hand, exhibit a temporally greater amount of tooth loss per individual and a temporal decrease in dental wear. Despite the lack of significant trends in periapical lesions and dental caries, the patterns that emerge indicate that a dietary change took place. However, this change may be associated with food preparation techniques, rather than dietary components. The lack of temporal trend in dental caries suggests that the level of carbohydrates consumed by the population did not change. The changes in dental wear and antemortem tooth loss, though, may reflect a softer diet in which there was less abrasion and attrition.

Skeletal indicators of activity patterns reveal several significant trends. Among adults, there is a temporal increase in the prevalence of DJD for the left elbow and wrist, suggesting that the use of the left arm increased with urbanization. This trend may be the result of an increase in activity involving both the right and left arms. The right hand would have likely been used regardless of whether the activity was one-handed or two, because the majority of people are right-handed. A second trend observed is a temporal decrease in the prevalence of DJD of the right and left hips, probably due to an overall decrease in mobility associated with urbanization. As individuals began to specialize in a certain craft, it is likely that the same level of mobility associated with agricultural pursuits was not needed. Finally, there is a significant temporal trend in the sex-based differences in prevalence of DJD. Over time, males begin to have a significantly higher prevalence of DJD than females, which may be the result of the sexual division of labor associated with craft specialization. Although such a division of labor was also likely present in agricultural populations, the new activities of males and females may account for the increase in DJD for males, but not for females. Males may have been engaged in more repetitive types of activity rapidly causing degeneration of the joints. In agriculture, there was likely a greater range of activities for males, slowing the degenerative changes to a specific joint, because it was not used repetitively on a daily basis.

Lastly, although there are no significant trends in traumatic injuries, there are a few notable patterns that emerge. First, the majority of individuals exhibiting traumatic lesions are male. In addition, all evidence of injury from violent or potentially violent sources is found in male skeletal remains. Finally, subadults do not exhibit any evidence of trauma. These patterns suggest that males were at highest risk of injury, likely due to their daily activities associated with craft specialization as well as their required military service. Females may have also been at risk, but less so than males, especially since they were not involved in combat.

In all, two of the four hypotheses are supported by these trends, at least to some degree, as the Poznań samples exhibit mild changes in health and in activity patterns in conjunction with urbanization. However, contrary to the hypotheses, evidence suggests that diet did change and the interpersonal violence did not. Several explanations may account for the expected and unexpected outcomes of this study. First, it is important to realize that in examining archaeological samples, it is impossible to determine who was born, raised, and died in the urban setting from those who were born and raised elsewhere and migrated to the city where they later died (Lewis, 2002). This, of course, confounds the study, as individuals from rural settings may be included in the urban skeletal sample. As such, the samples from the Poznań cemeteries may not be representative of the population as a whole. Additionally, many skeletal remains had to be removed from the sample due to their disturbance and inability to be assigned to a burial level. As a result, the sample sizes for each temporal period decreased. For any given pathological condition, the number of skeletal elements that could be observed was oftentimes less than 50. When separated by age and sex, these sample sizes decreased even more. Given greater sample sizes, more significant results and trends may have been found. However, despite the small samples sizes, some significant trends indicate health status changed mildly with increasing urbanization.

A more severe or substantial change in health may have occurred due to urbanization, but it may have taken place after the terminal date of the Poznań samples (A.D. 1250). Evidence from these samples suggests that the change was mild, at least during the first two hundred years of urbanization. The more severe and noticeable change may not have occurred until later in the medieval period. Another possible explanation for the mild change in health is that although urbanization occurred and intensified in Poznań, during the time represented by these samples, the population density had not reached the point at which health was affected to a larger degree. The negative effects associated with increased population density and sedentism, including accumulation of garbage and waste, pollution of the water supply, and poor sanitation, were present, but were not yet a substantial problem. While individuals were exposed to pathogens during the initial phases of urbanization, the poor sanitary conditions worsened over time, increasing the amount and type of pathogens to which the population was exposed. In the later medieval period, this may have resulted in greater amounts of systemic stress and infection than what is observed in the Poznań samples. In addition, with a still relatively low population density (compared to later periods), the transmission of "crowd" diseases, such as leprosy may have been only slightly higher than in agricultural areas, resulting in their overall low prevalence rates in the Poznań samples.

The expected changes in activity patterns reflect the shift from agricultural pursuits to craft specialization. In males and females, there was an increased use of the left arm, which suggests that more activities of craft specialization involved both hands than in agricultural activities. In addition, the reduction in degenerative changes of both hips indicates that mobility decreased with increasing urbanization. Males experienced an increase in prevalence of DJD, which was not observed in females. This is probably a reflection of the new division of labor associated with craft specialization. While such a sexual division of labor was also probably present with agriculture, males and females may have still had a similar level of degenerative changes. With craft specialization, there was a greater diversity in these degenerative changes between males and females as both sexes undertook new activities.

Some dietary indicators suggest that diet did change with urbanization, which does not support the predicted outcome. While the types of foods consumed may not have changed, especially concerning amounts of carbohydrates or other cariogenic foods, the processing of food may have changed, making it softer and less abrasive. As a result, dental wear severity declined in adults. Since the Polish rulers required that farmers and fishermen provide foods to the inhabitants of the city, people would have, in general consumed the same types of foods (Gieysztor et al., 1968). However, those living in the city may have used different processes in preparing the food for consumption.

The lack of increase in traumatic injuries reflecting escalation of interpersonal violence may be due to the sample composition. It is possible that those who died in battle were buried in separate, military cemeteries, rather than the municipal or church cemeteries in which other residents were interred. As males are considered to have been the predominant group involved in warfare, the sample in this study would be expected to have fewer males. Although there are no statistically significant differences in any temporal period between the number of males and females, the early urbanization and late urbanization samples favor females. During the earliest temporal period, the number of males and females are almost identical. The numbers become disparate, in favor of females with increasing urbanization. If males were, in fact, buried in a separate cemetery when they died in battle, it would be expected that with increasing urbanization and increasing warfare, more males would be missing from the municipal and church cemeteries over time. However, despite this suggestion, no evidence of a military cemetery from this period has yet been located in Poznań.

The results of this study have implications for urbanization studies as a whole. By tracking changes in health, activity patterns, diet, and interpersonal violence over 300 years of an urban transition, this study was able to address whether significant changes took place and how severe and widespread these changes were. This study suggests that health status did change mildly during the initial period of urbanization in Poland. A more substantial change in health, however, may have occurred later in urbanization. These results do indicate that the health change was gradual and not severe. The lack of a rapid and severe health change may, in part, explain why urbanization trends continued in this and other populations, despite detrimental impacts on health. The population would not have perceived the slow and mild impact on health. Even if they were noticed, it is likely that such mild consequences would not have been considered important, especially in the face of economic opportunities afforded by the urban center. The population may have simply adapted to the environment with greater health risks, especially if there were other benefits that far outweighed the health effects (Goodman et al., 1988). Studies of urbanization, then, must take into account not only the negative consequences, but also the severity and the rate or pace of change. If not, important contextual information and considerations for the persistence of urbanization will be overlooked.

Future Research

In light of the results of this study, more research on urbanization in Poland will provide additional information to refine the conclusions drawn here. For example, the hypotheses that urbanization did cause a change in health can be further tested with additional samples from Poznań that date to the later medieval period. In addition, comparisons to contemporaneous rural samples from neighboring areas will offer insight into whether community health in the city was substantially different from the health of those living in agricultural settings. Further comparisons with other Polish medieval urban samples will be useful in determining whether the Poznań population is representative of a general trend in Poland. Comparisons with medieval urban samples from other countries may also provide insight into how urbanization affected Poland, in particular, and Europe, in general.

While a wide variety of skeletal markers and pathological conditions were used to assess health, activity patterns, diet, and interpersonal violence, there are additional indicators that can be used. For example, the changes in activity patterns will be confirmed with assessments of changes in the structure of long bones. Cross-sectional geometry, in which engineering principles are applied to the long bones, can be used to measure changes in shape that reflect changes in activity (Larsen, 1997). Dietary changes can also be assessed through bone chemistry. Stable isotope analysis of carbon and nitrogen are used to elicit dietary differences in plant and animal consumption (Larsen, 1997). These analyses will be conducted for the Poznań samples in the near future in order to confirm whether diet did change with urbanization.

CHAPTER 6

CONCLUSIONS

This study has provided insight into a medieval Polish population and the consequences of urbanization. The results support two of the four main hypotheses, leading to a number of conclusions. First, there is evidence of a change in health, albeit a mild one. A more severe change may have occurred later, after the terminal date of the samples used in this study (A.D. 1250), as urbanization continued to intensify. This has important implications for urbanization studies focused on addressing why urbanization persisted despite health effects. In this case, over the first 200 years of urbanization, only a mild change in health occurred. It is very likely that the population as a whole did not recognize that health was changing because it happened so gradually and the overall effect was mild. As a result, a change in community health status was simply not a factor in the persistence of urbanization.

Overall, activity patterns did change in conjunction with urbanization. Increases in the degenerative changes of the left arm suggest that both arms were used in activities after the shift to craft specialization. In addition, decreases in the degenerative changes of both hips indicate that mobility decreased with urbanization. Finally, adult males increased in the prevalence of degenerative changes, while adult females did not. This sex-based difference likely reflects a sexual division of labor associated with craft specialization and urbanization.

Evidence suggests that diet did change, although it may not have been a change in the types of foods consumed, but rather in the processing and preparation of the food. This idea is further supported by the fact that Polish rulers required agricultural goods as well as fish and game be provided to the inhabitants of the city, thereby maintaining the same general diet of the population. The observed changes in some of the dental markers, then, may be a function of food preparation techniques.

In general, levels of interpersonal violence remained the same over time, regardless of urbanization. Evidence suggests that adult males sustained the majority of traumatic injuries and that few females and no subadults were affected. Moreover, all evidence of injuries from violent or potentially violent sources was found in males, which is expected since males were required to perform a military service. Although there is a lack of a significant temporal trend for traumatic injuries and, therefore, interpersonal violence, it is possible that those killed in battle were buried in a separate, military cemetery and, thus, are not included in the samples used here.

The results of this study are important for other urbanization studies, as it emphasizes the need to consider the nature of changes that taking place in conjunction with urbanization. In other words, it is essential that the rate of change as well as its severity be taken into account, as these factors may determine whether a potential negative consequence of urbanization was readily detected by the population as a whole. This study suggests that health did change mildly with urbanization; however, a more severe change may not have occurred until much later in urbanization. As such, the population probably did not recognize that health had changed over 300 or more years; therefore, it would not have been a consideration in people's decision to move to urban areas or to remain there. Urbanization studies seeking to understand the persistence of urbanization despite negative consequences should consider these factors in order to gain a better understanding of urbanization.

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APPENDIX A

SCORING SYSTEM FOR SKELETAL MARKERS

Score	Description
0	Unobservable
1	Absent
2	Slight to severe porosity
3	Extensive pitting and expansion of diploë

Table A.1. Porotic hyperostosis scoring

Score	Description
0	Unobservable
1	Absent
2	Small area of porosity
3	Substantial area of porosity

Table A.2. Cribra orbitalia scoring

Score	Description
0	Unobservable
1	Absent
2	One hypoplastic defect
3	Two or more hypoplastic defects

Table A.3. Enamel hypoplasia scoring

Score	Description
0	Unobservable
1	Absent
2	Longitudinal striations
3	Small areas of reactive bone, less than one-quarter of surface
4	Moderate areas of reactive bone, less than one-half of surface
5	Extensive periosteal reaction and cortical expansion, more than one-half of surface
6	Osteomyelitis
7	Periostitis associated with a fracture

Table A.4. Periostitis scoring

Score	Description
0	Unobservable
1	Absent
2	Distinct resorptive changes

Table A.5. Leprosy of fingers and toes scoring

Score	Description
0	Unobservable
1	Absent
2	Bone loss, including pitting of palate and/or loss of nasal spine

Table A.6. Naso-pharyngeal lesions scoring (leprosy and treponematosis)

Score	Description
0	Unobservable
1	Absent
2	Stellate lesions present

Table A.7. Treponematosis of cranium scoring

Score	Description
0	Unobservable
1	Absent
2	Lytic lesions on at least one vertebral body

Table A.8. Tuberculosis of vertebrae scoring

Score	Description
0	Unobservable
1-24	Number of ribs with lesions

Table A.9. Tuberculosis of ribs scoring

Score	Description
0	Unobservable
1	Absent
2	Small, pinpoint size lesion
3	Moderate lesion
4	Large lesion, endangering pulp cavity
5	Pulp exposure due to lesion

Table A.10. Carious lesion size scoring

Score	Description
0	Unobservable
1	Absent
2	Trace amount on tooth surface
3	Slight; less than one-third of tooth surface affected
4	Moderate; more than one-third, but less than one-half of tooth surface affected
5	Severe; more than one-half of tooth surface affected

Table A.11. Dental calculus scoring

Score	Description
0	Unobservable
1	Unworn
2	Blunting of cusps
3	Blunting of cusps and initial dentin exposure
4	Several areas of dentin exposure
5	Coalescence of two dentinal areas
6	Coalescence of three or four dentinal areas
7	Enamel ring intact, but entire occlusal surface has dentin exposure
8	Severe loss of crown height with an incomplete enamel ring

Table A.12. Dental wear scoring

Score	Description
0	Unobservable
1	Absent
2	Slight marginal lipping, small osteophytes present, small areas of porosity possible
3	Substantial marginal lipping, substantial porosity of joint surface, larger osteophytes present
4	Complete or near complete destruction of joint surface, including eburnation
5	Joint fusion

Table A.13. DJD of limb joints and temporomandibular joint scoring

Score	Description
0	Unobservable
1	Absent
2	Osteophytes on at least one vertebral body
3	Extensive osteophytes on at least one vertebral body

Table A.14. DJD of vertebrae scoring

Location
Cranial vault
Nasal bones
Non-nasal facial bones
Long bones
Other post-cranial elements

Table A.15. Traumatic injury classification by location

Parameter	Description
1	Bone(s) affected
2	Portion of bone affected
3	Type of fracture or wound
4	Size of injury
5	Degree of healing
6	Associated complications
7	Type of weapon, if applicable

Table A.16. Traumatic injury classification parameters

APPENDIX B

STATISTICS

Time Period	Cribra Orbitalia	Porotic Hyperostosis	Enamel Hypoplasia
Pre-Urbanization	1/18 0.06	4/18 0.22	9/20 0.45
Early Urbanization	3/22 0.14	5/21 0.24	14/19 0.74
Late Urbanization	3/19 0.16	3/20 0.15	6/15 0.40
p-value (chi-square)	n/a	n/a	0.0910
p-value (Fisher's exact)			n/a
pre vs. early	0.6133	1	-
pre vs. late	0.6039	0.6867	-
early vs. late	1	0.6965	-

Table B.1. Temporal comparison of prevalence of systemic stress indicators in adults (N-affected/N-total; prevalence rate)

Time Period	**Cribra Orbitalia**	**Porotic Hyperostosis**	**Enamel Hypoplasia**
Pre-Urbanization	1/8 0.13	1/9 0.11	4/9 0.44
Early Urbanization	2/12 0.17	2/12 0.17	7/10 0.70
Late Urbanization	3/12 0.25	0/12 0	3/9 0.33
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)			
pre vs. early	1.0000	1.0000	0.3698
pre vs. late	0.6186	0.4286	1.0000
early vs. late	1.0000	0.4783	0.1789

Table B.2. Temporal comparison of prevalence of systemic stress indicators in adult females (N-affected/N-total; prevalence rate)

Time Period	Cribra Orbitalia	Porotic Hyperostosis	Enamel Hypoplasia
Pre-Urbanization	0/7 0	3/7 0.43	4/8 0.50
Early Urbanization	1/8 0.13	3/8 0.38	6/8 0.75
Late Urbanization	0/4 0	2/5 0.40	3/5 0.60
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)			
pre vs. early	1.0000	1.0000	0.6084
pre vs. late	n/a	1.0000	1.0000
early vs. late	1.0000	1.0000	1.0000

Table B.3. Temporal comparison of prevalence of systemic stress indicators in adult males (N-affected/N-total; prevalence rate)

Time Period	**Cribra Orbitalia**	**Porotic Hyperostosis**	**Enamel Hypoplasia**
Pre-Urbanization	1/6 0.17	0/7 0	2/4 0.50
Early Urbanization	8/17 0.47	1/19 0.05	4/8 0.50
Late Urbanization	4/11 0.36	2/11 0.18	5/5 1.00
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)			
pre vs. early	0.3401	1.0000	1.0000
pre vs. late	0.6000	0.4967	0.1667
early vs. late	0.7047	0.5367	0.1049

Table B.4. Temporal comparison of prevalence of systemic stress indicators in subadults (N-affected/N-total; prevalence rate)

Time Period	**Cribra Orbitalia**	**Porotic Hyperostosis**	**Enamel Hypoplasia**
Pre-Urbanization			
Females	1/8 0.13	1/9 0.11	4/9 0.44
Males	0/7 0	3/7 0.43	4/8 0.50
p-value (Fisher's exact)	1.0000	0.2615	1.0000
Early Urbanization			
Females	2/12 0.17	2/12 0.17	7/10 0.70
Males	1/8 0.13	3/8 0.38	6/8 0.75
p-value (Fisher's exact)	1.0000	0.3473	1.0000
Late Urbanization			
Females	3/12 0.25	0/12 0	3/9 0.33
Males	0/4 0	2/5 0.40	3/5 0.60
p-value (Fisher's exact)	0.5286	0.0735	0.5804

Table B.5. Temporal comparison of sex differences in prevalence of systemic stress indicators (N-affected/N-total; prevalence rate)

Time Period	Cribra Orbitalia	Porotic Hyperostosis	Enamel Hypoplasia
Pre-Urbanization			
Adult	1/18 0.05	4/18 0.22	9/20 0.45
Subadult	1/6 0.16	0/7 0	2/4 0.50
p-value (Fisher's exact)	0.4457	0.2945	1.0000
Early Urbanization			
Adult	3/22 0.14	5/21 0.24	14/19 0.74
Subadult	8/17 0.47	1/19 0.05	4/8 0.50
p-value (Fisher's exact)	0.0329*	0.1856	0.3748
Late Urbanization			
Adult	3/19 0.16	3/20 0.15	6/15 0.40
Subadult	4/12 0.33	2/12 0.17	5/5 1.00
p-value (Fisher's exact)	0.3839	1.0000	0.0379*

Table B.6. Temporal comparison of age differences in prevalence of systemic stress indicators (*significant, $p \leq 0.05$) (N-affected/N-total; prevalence rate)

	Cribra Orbitalia	Cribra Orbitalia
	Prevalence of Score of 2	**Prevalence of Score of 3**
Pre-Urbanization	1/1 1.00	0/1 0
Early Urbanization	0/3 0	3/3 1.00
Late Urbanization	3/3 1.00	0/3 0

p-values (Fisher's exact)	3
2	
pre vs. early	0.2500
pre vs. late	n/a
early vs. late	0.1000

Table B.7. Temporal comparison of cribra orbitalia severity in adults
(N-individuals with severity level/N-total individuals with cribra orbitalia; prevalence rate)

Time Period	Cribra Orbitalia	Cribra Orbitalia
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization	1/1 1.00	0/1 0
Early Urbanization	0/2 0	2/2 1.00
Late Urbanization	3/3 1.00	0/3 0

p-values (Fisher's exact)	3
2	
pre vs. early	0.3333
pre vs. late	n/a
early vs. late	0.1000

Table B.8**.** Temporal comparison of cribra orbitalia severity in adult females (N-individuals with severity level/N-total individuals with cribra orbitalia; prevalence rate)

Time Period	Cribra Orbitalia
	Prevalence of Score of 3
Pre-Urbanization	0/0 0
Early Urbanization	1/1 1.00
Late Urbanization	0/0 0
p-value (chi-square)	n/a
p-value (Fisher's exact)	n/a

Table B.9. Temporal comparison of cribra orbitalia severity in adult males (N-individuals with severity level/N-total individuals with cribra orbitalia; prevalence rate)

Time Period	**Cribra Orbitalia**	**Cribra Orbitalia**
	Prevalence of Score of 2	**Prevalence of Score of 3**
Pre-Urbanization	1/1 1.00	0/1 0
Early Urbanization	7/8 0.88	1/8 0.13
Late Urbanization	4/4 1.00	0/4 0

p-values (Fisher's exact)	**3**
2	
pre vs. early	1.0000
pre vs. late	n/a
early vs. late	1.0000

Table B.10. Temporal comparison of cribra orbitalia severity in subadults (N-individuals with severity level/N-total individuals with cribra orbitalia; prevalence rate)

Time Period	Cribra Orbitalia	Cribra Orbitalia
	Prevalence of Score of 2	**Prevalence of Score of 3**
Pre-Urbanization		
Females	1/1 1.00	n/a
Males	0/0 0	n/a
p-value (Fisher's exact)	n/a	n/a
Early Urbanization		
Females	n/a	2/2 1.00
Males	n/a	1/1 1.00
p-value (Fisher's exact)	n/a	n/a
Late Urbanization		
Females	3/3 1.00	n/a
Males	0/0 0	n/a
p-value (Fisher's exact)	n/a	n/a

Table B.11. Temporal comparison of sex differences in cribra orbitalia severity (N-individuals with severity level/N-total individuals with cribra orbitalia; prevalence rate)

Time Period	Cribra Orbitalia	Cribra Orbitalia
	Prevalence of Score of 2	**Prevalence of Score of 3**
Pre-Urbanization		
Adults	1/1 1.00	n/a
Subadults	1/1 1.00	n/a
p-value (Fisher's exact)	n/a	n/a
Early Urbanization		
Adults	0/3 0	3/3 1.00
Subadults	7/8 0.88	1/8 0.13
p-value (Fisher's exact)	n/a	n/a
Late Urbanization		
Adults	3/3 1.00	n/a
Subadults	4/4 1.00	n/a
p-value (Fisher's exact)	n/a	n/a

p-values (Fisher's Exact) Pre-Urbanization	**3**
2	n/a
p-values (Fisher's Exact) Early Urbanization	3
2	0.0329*
p-values (Fisher's Exact) Late Urbanization	3
2	n/a

Table B.12. Temporal comparison of age differences in cribra orbitalia severity (*significant, p≤0.05) (N-individuals with severity level/N-total individuals with cribra orbitalia; prevalence rate)

Time Period	Porotic Hyperostosis
	Prevalence of Score of 2
Pre-Urbanization	4/4 1.00
Early Urbanization	5/5 1.00
Late Urbanization	3/3 1.00
p-value (chi-square)	n/a
p-value (Fisher's exact)	n/a

Table B.13. Temporal comparison of porotic hyperostosis severity in adults (N-individuals with severity level/N-total individuals with porotic hyperostosis; prevalence rate)

Time Period	Porotic Hyperostosis
	Prevalence of Score of 2
Pre-Urbanization	1/1 1.00
Early Urbanization	2/2 1.00
Late Urbanization	0/0 0
p-value (chi-square)	n/a
p-value (Fisher's exact)	n/a

Table B.14. Temporal comparison of porotic hyperostosis severity in adult females (N-individuals with severity level/N-total individuals with porotic hyperostosis; prevalence rate)

Time Period	**Porotic Hyperostosis**
	Prevalence of Score of 2
Pre-Urbanization	3/3 1.00
Early Urbanization	3/3 1.00
Late Urbanization	2/2 1.00
p-value (chi-square)	n/a
p-value (Fisher's exact)	n/a

Table B.15. Temporal comparison of porotic hyperostosis severity in adult males (N-individuals with severity level/N-total individuals with porotic hyperostosis; prevalence rate)

Time Period	Porotic Hyperostosis
	Prevalence of Score of 2
Pre-Urbanization	0/0 0
Early Urbanization	1/1 1.00
Late Urbanization	2/2 1.00
p-value (chi-square)	n/a
p-value (Fisher's exact)	n/a

Table B.16. Temporal comparison of porotic hyperostosis severity in subadults (N-individuals with severity level/N-total individuals with porotic hyperostosis; prevalence rate)

Time Period	**Porotic Hyperostosis**
	Prevalence of Score of 2
Pre-Urbanization	
Females	1/1 1.00
Males	3/3 1.00
p-value	n/a
Early Urbanization	
Females	2/2 1.00
Males	3/3 1.00
p-value	n/a
Late Urbanization	
Females	0/0 0
Males	2/2 1.00
p-value	n/a

Table B.17. Temporal comparison of sex differences in porotic hyperostosis severity (N-individuals with severity level/N-total individuals with porotic hyperostosis; prevalence rate)

Time Period	**Porotic Hyperostosis**
	Prevalence of Score of 2
Pre-Urbanization	
Adults	4/4 1.00
Subadults	n/a
p-value (Fisher's exact)	n/a
Early Urbanization	
Adults	5/5 1.00
Subadults	1/1 1.00
p-value (Fisher's exact)	n/a
Late Urbanization	
Adults	3/3 1.00
Subadults	2/2 1.00
p-value (Fisher's exact)	n/a

Table B.18. Temporal comparison of age differences in porotic hyperostosis severity (N-individuals with severity level/N-total individuals with porotic hyperostosis; prevalence rate)

Time Period	Enamel Hypoplasia - Mandibular Canine	Enamel Hypoplasia - Mandibular Canine
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization	4/8 0.50	4/8 0.50
Early Urbanization	9/10 0.90	1/10 0.10
Late Urbanization	2/4 0.50	2/4 0.50

p-values (Fisher's exact)	3
2	
pre vs. early	0.1176
pre vs. late	1.0000
early vs. late	0.1758

Table B.19. Temporal comparison of enamel hypoplasia (mandibular canine) severity in adults (N-individuals with severity level/N-total individuals with enamel hypoplasias; prevalence rate)

Time Period	Enamel Hypoplasia - Mandibular Incisor	Enamel Hypoplasia - Mandibular Incisor
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization	2/4 0.50	2/4 0.50
Early Urbanization	1/2 0.50	1/2 0.50
Late Urbanization	3/3 1.00	0/3 0

p-values (Fisher's exact)	3
2	
pre vs. early	1.0000
pre vs. late	0.4286
early vs. late	0.4000

Table B.20. Temporal comparison of enamel hypoplasia (mandibular incisor) severity in adults (N-individuals with severity level/N-total individuals with enamel hypoplasias; prevalence rate)

Time Period	Enamel Hypoplasia - Maxillary Canine	Enamel Hypoplasia - Maxillary Canine
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization	4/6 0.67	2/6 0.33
Early Urbanization	5/5 1.00	0/5 0
Late Urbanization	1/2 0.50	1/2 0.50

p-values (Fisher's exact)	3
2	
pre vs. early	0.4545
pre vs. late	1.0000
early vs. late	0.2857

Table B.21. Temporal comparison of enamel hypoplasia (maxillary canine) severity in adults (N-individuals with severity level/N-total individuals with enamel hypoplasias; prevalence rate)

Time Period	Enamel Hypoplasia - Maxillary Incisor	Enamel Hypoplasia - Maxillary Incisor
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization	4/6 0.67	2/6 0.33
Early Urbanization	3/4 0.75	1/4 0.25
Late Urbanization	2/2 1.00	0/2 0

p-values (Fisher's exact)	3
2	
pre vs. early	1.0000
pre vs. late	1.0000
early vs. late	1.0000

Table B.22. Temporal comparison of enamel hypoplasia (maxillary incisor) severity in adults (N-individuals with severity level/N-total individuals with enamel hypoplasias; prevalence rate)

Time Period	Enamel Hypoplasia - Mandibular Canine	Enamel Hypoplasia - Mandibular Canine
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization	1/4 0.25	3/4 0.75
Early Urbanization	5/5 1.00	0/5 0
Late Urbanization	1/3 0.33	2/3 0.67

p-values (Fisher's exact)	2
2	
pre vs. early	0.0476*
pre vs. late	1.0000
early vs. late	0.1071

Table B.23. Temporal comparison of enamel hypoplasia (mandibular canine) severity in adult females (*significant, p≤0.05) (N-individuals with severity level/N-total individuals with enamel hypoplasias; prevalence rate)

Time Period	Enamel Hypoplasia - Mandibular Incisor	Enamel Hypoplasia - Mandibular Incisor
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization	0/2 0	2/2 1.00
Early Urbanization	1/2 0.50	1/2 0.50
Late Urbanization	1/1 1.00	0/1 0

p-values (Fisher's exact)	3
2	
pre vs. early	1.0000
pre vs. late	0.3333
early vs. late	1.0000

Table B.24. Temporal comparison of enamel hypoplasia (mandibular incisor) severity in adult females (N-individuals with severity level/N-total individuals with enamel hypoplasias; prevalence rate)

Time Period	Enamel Hypoplasia - Maxillary Canine	Enamel Hypoplasia - Maxillary Canine
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization	0/2 0	2/2 1.00
Early Urbanization	2/2 1.00	0/2 0
Late Urbanization	0/1 0	1/1 1.00

p-values (Fisher's exact)	3
2	
pre vs. early	0.3333
pre vs. late	n/a
early vs. late	0.3333

Table B.25. Temporal comparison of enamel hypoplasia (maxillary canine) severity in adult females (N-individuals with severity level/N-total individuals with enamel hypoplasias; prevalence rate)

Time Period	Enamel Hypoplasia - Maxillary Incisor	Enamel Hypoplasia - Maxillary Incisor
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization	1/2 0.50	1/2 0.50
Early Urbanization	0/1 0	1/1 1.00
Late Urbanization	2/2 1.00	0/2 0

p-values (Fisher's exact)	3
2	
pre vs. early	1.0000
pre vs. late	1.0000
early vs. late	0.3333

Table B.26. Temporal comparison of enamel hypoplasia (maxillary incisor) severity in adult females (N-individuals with severity level/N-total individuals with enamel hypoplasias; prevalence rate)

Time Period	Enamel Hypoplasia - Mandibular Canine	Enamel Hypoplasia - Mandibular Canine
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization	2/3 0.67	1/3 0.33
Early Urbanization	4/5 0.80	1/5 0.20
Late Urbanization	1/1 1.00	0/1 0

p-values (Fisher's exact)	3
2	
pre vs. early	1.0000
pre vs. late	1.0000
early vs. late	1.0000

Table B.27. Temporal comparison of enamel hypoplasia (mandibular canine) severity in adult males (N-individuals with severity level/N-total individuals with enamel hypoplasias; prevalence rate)

Time Period	Enamel Hypoplasia - Mandibular Incisor	Enamel Hypoplasia - Mandibular Incisor
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization	2/2 1.00	0/2 0
Early Urbanization	0/1 0	1/1 1.00
Late Urbanization	2/2 1.00	0/2 0

p-values (Fisher's exact)	3
2	
pre vs. early	0.3333
pre vs. late	n/a
early vs. late	0.3333

Table B.28. Temporal comparison of enamel hypoplasia (mandibular incisor) severity in adult males (N-individuals with severity level/N-total individuals with enamel hypoplasias; prevalence rate)

Time Period	Enamel Hypoplasia - Maxillary Canine
	Prevalence of Score of 2
Pre-Urbanization	4/4 1.00
Early Urbanization	1/1 1.00
Late Urbanization	1/1 1.00
p-value (chi-square)	n/a
p-value (Fisher's exact)	n/a

Table B.29. Temporal comparison of enamel hypoplasia (maxillary canine) severity in adult males (N-individuals with severity level/N-total individuals with enamel hypoplasias; prevalence rate)

Time Period	Enamel Hypoplasia - Maxillary Incisor	Enamel Hypoplasia - Maxillary Incisor
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization	3/4 0.75	1/4 0.25
Early Urbanization	2/2 1.00	0/2 0
Late Urbanization	0/0 0	0/0 0

p-values (Fisher's exact)	2
2	
pre vs. early	1.0000
pre vs. late	n/a
early vs. late	n/a

Table B.30. Temporal comparison of enamel hypoplasia (maxillary incisor) severity in adult males (N-individuals with severity level/N-total individuals with enamel hypoplasias; prevalence rate)

Time Period	Enamel Hypoplasia-Mandibular Canine
	Prevalence of Score of 2
Pre-Urbanization	0/0 0
Early Urbanization	3/3 1.00
Late Urbanization	2/2 1.00
p-value (chi-square)	n/a
p-value (Fisher's exact)	n/a

Table B.31. Temporal comparison of enamel hypoplasia (mandibular canine) severity in subadults (N-individuals with severity level/N-total individuals with enamel hypoplasias; prevalence rate)

Time Period	Enamel Hypoplasia - Mandibular Incisor	Enamel Hypoplasia - Mandibular Incisor
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization	1/1 1.00	0/1 0
Early Urbanization	1/2 0.50	1/2 0.50
Late Urbanization	2/4 0.50	2/4 0.50

p-values (Fisher's exact)	3
2	
pre vs. early	1.0000
pre vs. late	1.0000
early vs. late	1.0000

Table B.32. Temporal comparison of enamel hypoplasia (mandibular incisor) severity in subadults (N-individuals with severity level/N-total individuals with enamel hypoplasias; prevalence rate)

Time Period	Enamel Hypoplasia - Maxillary Incisor	Enamel Hypoplasia - Maxillary Incisor
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization	0/1 0	1/1 1.00
Early Urbanization	1/1 1.00	0/1 0
Late Urbanization	0/2 0	2/2 1.00

p-values (Fisher's exact)	3
2	
pre vs. early	1.0000
pre vs. late	n/a
early vs. late	0.3333

Table B.33. Temporal comparison of enamel hypoplasia (maxillary incisor) severity in subadults (N-individuals with severity level/N-total individuals with enamel hypoplasias; prevalence rate)

Time Period	Enamel Hypoplasia - Mandibular Canine	Enamel Hypoplasia - Mandibular Canine
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization		
Females	1/4 0.25	3/4 0.75
Males	2/3 0.67	1/3 0.33
Early Urbanization		
Females	5/5 1.00	0/5 0
Males	4/5 0.80	1/5 0.20
Late Urbanization		
Females	1/3 0.33	2/3 0.67
Males	1/1 1.00	0/1 0

p-values (Fisher's Exact) Pre-Urbanization	3
2	0.4857
p-values (Fisher's Exact) Early Urbanization	**3**
2	1.0000
p-values (Fisher's Exact) Late Urbanization	**3**
2	1.0000

Table B.34. Temporal comparison of sex differences in enamel hypoplasia (mandibular canine) severity (N-individuals with severity level/N-total individuals with enamel hypoplasias; prevalence rate)

Time Period	Enamel Hypoplasia - Mandibular Incisor	Enamel Hypoplasia - Mandibular Incisor
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization		
Females	0/2 0	2/2 1.00
Males	2/2 1.00	0/2 0
Early Urbanization		
Females	1/2 0.50	1/2 0.50
Males	0/1 0	1/1 1.00
Late Urbanization		
Females	1/1 1.00	n/a
Males	2/2 1.00	n/a

p-values (Fisher's Exact) Pre-Urbanization	3
2	0.3333
p-values (Fisher's Exact) Early Urbanization	**3**
2	1.0000
p-values (Fisher's Exact) Late Urbanization	**3**
2	n/a

Table B.35. Temporal comparison of sex differences in enamel hypoplasia (mandibular incisor) severity (N-individuals with severity level/N-total individuals with enamel hypoplasias; prevalence rate)

Time Period	Enamel Hypoplasia - Maxillary Canine	Enamel Hypoplasia - Maxillary Canine
	Prevalence of Score of 2	**Prevalence of Score of 3**
Pre-Urbanization		
Females	0/2 0	2/2 1.00
Males	4/4 1.00	0/4 0
Early Urbanization		
Females	2/2 1.00	n/a
Males	1/1 1.00	n/a
Late Urbanization		
Females	0/1 0	1/1 1.00
Males	1/1 1.00	0/1 0

p-values (Fisher's Exact) Pre-Urbanization	3
2	0.0667
p-values (Fisher's Exact) Early Urbanization	**3**
2	n/a
p-values (Fisher's Exact) Late Urbanization	**3**
2	1.0000

Table B.36. Temporal comparison of sex differences in enamel hypoplasia (maxillary canine) severity (N-individuals with severity level/N-total individuals with enamel hypoplasias; prevalence rate)

Time Period	Enamel Hypoplasia - Maxillary Incisor	Enamel Hypoplasia - Maxillary Incisor
	Prevalence of Score of 2	**Prevalence of Score of 3**
Pre-Urbanization		
Females	1/2 0.50	1/2 0.50
Males	3/4 0.75	1/4 0.25
Early Urbanization		
Females	0/1 0	1/1 1.00
Males	2/2 1.00	0/2 0
Late Urbanization		
Females	2/2 1.00	n/a
Males	0/0 0	n/a

p-values (Fisher's Exact) Pre-Urbanization	3
2	1.0000
p-values (Fisher's Exact) Early Urbanization	**3**
2	0.3333
p-values (Fisher's Exact) Late Urbanization	**3**
2	n/a

Table B.37. Temporal comparison of sex differences in enamel hypoplasia (maxillary incisor) severity (N-individuals with severity level/N-total individuals with enamel hypoplasias; prevalence rate)

Time Period	Enamel Hypoplasia - Mandibular Canine	Enamel Hypoplasia - Mandibular Canine
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization		
Adults	4/8 0.50	4/8 0.50
Subadults	n/a	n/a
Early Urbanization		
Adults	9/10 0.90	1/10 0.10
Subadults	3/3 1.00	0/3 0
Late Urbanization		
Adults	2/4 0.50	2/4 0.50
Subadults	2/2 1.00	0/2 0

p-values (Fisher's Exact) Pre-Urbanization	**3**
2	n/a
p-values (Fisher's Exact) Early Urbanization	**3**
2	1.0000
p-values (Fisher's Exact) Late Urbanization	**3**
2	0.4667

Table B.38. Temporal comparison of age differences in enamel hypoplasia (mandibular canine) severity (N-individuals with severity level/N-total individuals with enamel hypoplasias; prevalence rate)

Time Period	Enamel Hypoplasia - Mandibular Incisor Prevalence of Score of 2	Enamel Hypoplasia -Mandibular Incisor Prevalence of Score of 3
Pre-Urbanization		
Adults	2/4 0.50	2/4 0.50
Subadults	1/1 1.00	0/1 0
Early Urbanization		
Adults	1/2 0.50	1/2 0.50
Subadults	1/2 0.50	1/2 0.50
Late Urbanization		
Adults	3/3 1.00	0/3 0
Subadults	2/4 0.50	2/4 0.50

p-values (Fisher's Exact) Pre-Urbanization	**3**
2	1.0000
p-values (Fisher's Exact) Early Urbanization	**3**
2	1.0000
p-values (Fisher's Exact) Late Urbanization	**3**
2	0.4286

Table B.39. Temporal comparison of age differences in enamel hypoplasia (mandibular incisor) severity (N-individuals with severity level/N-total individuals with enamel hypoplasias; prevalence rate)

Time Period	Enamel Hypoplasia - Maxillary Canine	Enamel Hypoplasia - Maxillary Canine
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization		
Adults	4/6 0.67	2/6 0.33
Subadults	n/a	n/a
Early Urbanization		
Adults	5/5 1.00	0/5 0
Subadults	n/a	n/a
Late Urbanization		
Adults	1/2 0.50	1/2 0.50
Subadults	n/a	n/a

p-values (Fisher's Exact) Pre-Urbanization	**3**
2	n/a
p-values (Fisher's Exact) Early Urbanization	**3**
2	n/a
p-values (Fisher's Exact) Late Urbanization	**3**
2	n/a

Table B.40. Temporal comparison of age differences in enamel hypoplasia (maxillary canine) severity (N-individuals with severity level/N-total individuals with enamel hypoplasias; prevalence rate)

Time Period	Enamel Hypoplasia - Maxillary Incisor	Enamel Hypoplasia - Maxillary Incisor
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization		
Adults	4/6 0.67	2/6 0.33
Subadults	0/1 0	1/1 1.00
Early Urbanization		
Adults	3/4 0.75	1/4 0.25
Subadults	1/1 1.00	0/1 0
Late Urbanization		
Adults	2/2 1.00	0/2 0
Subadults	0/2 0	2/2 1.00

p-values (Fisher's Exact) Pre-Urbanization	3
2	0.4286
p-values (Fisher's Exact) Early Urbanization	**3**
2	1.0000
p-values (Fisher's Exact) Late Urbanization	**3**
2	0.3333

Table B.41. Temporal comparison of age differences in enamel hypoplasia (maxillary incisor) severity (N-individuals with severity level/N-total individuals with enamel hypoplasias; prevalence rate)

Time Period	Periostitis
Pre-Urbanization	10/26 0.38
Early Urbanization	14/33 0.42
Late Urbanization	11/24 0.46
p-value (chi-square)	0.8695
p-value (Fisher's exact)	n/a

Table B.42. Temporal comparison of prevalence of periostitis in adults (N-affected/N-total; prevalence rate)

Time Period	Left Clavicle	Right Clavicle	Left Humerus	Right Humerus
Pre-Urbanization	0/5 0	0/6 0	0/0	0/0
Early Urbanization	1/5 0.20	1/7 0.14	0/0	0/0
Late Urbanization	0/6 0	0/7 0	0/0	0/0
p-value (chi-square)	n/a	n/a	n/a	n/a
p-value (Fisher's exact)			n/a	n/a
pre vs. early	1.0000	1.0000	-	-
pre vs. late	n/a	n/a	-	-
early vs. late	0.4545	1.0000	-	-
Time Period	**Left Radius**	**Right Radius**	**Left Ulna**	**Right Ulna**
Pre-Urbanization	0/4 0	0/0	0/4 0	0/0
Early Urbanization	0/5 0	0/0	0/5 0	0/0
Late Urbanization	1/8 0.13	0/0	1/8 0.13	0/0
p-value (chi-square)	n/a	n/a	n/a	n/a
p-value (Fisher's exact)		n/a		n/a
pre vs. early	n/a	-	n/a	-
pre vs. late	1.0000	-	1.0000	-
early vs. late	1.0000	-	1.0000	-

Table B.43. Temporal comparison of prevalence of periostitis of upper limbs in adults (N-affected/N-total; prevalence rate)

Time Period	Left Femur	Right Femur	Left Tibia
Pre-Urbanization	1/6 0.17	1/8 0.13	7/9 0.78
Early Urbanization	0/8 0	1/8 0.13	12/13 0.92
Late Urbanization	1/9 0.11	0/8 0	11/11 1.00
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)			
pre vs. early	0.4286	1.0000	0.5442
pre vs. late	1.0000	1.0000	0.1895
early vs. late	1.0000	1.0000	1.0000
Time Period	**Right Tibia**	**Left Fibula**	**Right Fibula**
Pre-Urbanization	10/10 1.00	1/9 0.11	2/9 0.22
Early Urbanization	10/12 0.83	2/11 0.18	3/10 0.30
Late Urbanization	9/9 1.00	3/9 0.33	1/8 0.13
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)			
pre vs. early	0.4905	1.0000	1.0000
pre vs. late	n/a	0.5765	1.0000
early vs. late	0.4857	0.6169	0.5882

Table B.44. Temporal comparison of prevalence of periostitis of lower limbs in adults (N-affected/N-total; prevalence rate)

Time Period	Periostitis
Pre-Urbanization	4/9 0.44
Early Urbanization	6/14 0.43
Late Urbanization	5/11 0.45
p-value (chi-square)	n/a
p-value (Fisher's exact)	
pre vs. early	1.0000
pre vs. late	1.0000
early vs. late	1.0000

Table B.45. Temporal comparison of prevalence of periostitis in adult females (N-affected/N-total; prevalence rate)

Time Period	Left Clavicle	Right Clavicle	Left Humerus	Right Humerus
Pre-Urbanization	0/0	0/0	0/0	0/0
Early Urbanization	0/0	0/0	0/0	0/0
Late Urbanization	0/0	0/0	0/0	0/0
p-value (chi-square)	n/a	n/a	n/a	n/a
p-value (Fisher's exact)	n/a	n/a	n/a	n/a
Time Period	**Left Radius**	**Right Radius**	**Left Ulna**	**Right Ulna**
Pre-Urbanization	0/1 0	0/0	0/1 0	0/0
Early Urbanization	0/3 0	0/0	0/3 0	0/0
Late Urbanization	1/4 0.25	0/0	1/4 0.25	0/0
p-value (chi-square)	n/a	n/a	n/a	n/a
p-value (Fisher's exact)		n/a		n/a
pre vs. early	n/a	-	n/a	-
pre vs. late	1.0000	-	1.0000	-
early vs. late	1.0000	-	1.0000	-

Table B.46. Temporal comparison of prevalence of periostitis of upper limbs in adult females (N-affected/N-total; prevalence rate)

Time Period	Left Femur	Right Femur	Left Tibia
Pre-Urbanization	0/2 0	0/0	3/3 1.00
Early Urbanization	0/3 0	0/0	6/6 1.00
Late Urbanization	1/5 0.20	0/0	5/5 1.00
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)		n/a	n/a
pre vs. early	n/a	-	-
pre vs. late	1.0000	-	-
early vs. late	1.0000	-	-
Time Period	**Right Tibia**	**Left Fibula**	**Right Fibula**
Pre-Urbanization	4/4 1.00	0/3 0	1/3 0.33
Early Urbanization	6/6 1.00	1/6 0.17	1/5 0.20
Late Urbanization	4/4 1.00	1/4 0.25	1/4 0.25
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)	n/a		
pre vs. early	-	1.0000	1.0000
pre vs. late	-	1.0000	1.0000
early vs. late	-	1.0000	1.0000

Table B.47. Temporal comparison of prevalence of periostitis of lower limbs in adult females (N-affected/N-total; prevalence rate)

Time Period	Periostitis
Pre-Urbanization	2/11 0.18
Early Urbanization	3/9 0.33
Late Urbanization	3/7 0.43
p-value (chi-square)	n/a
p-value (Fisher's exact)	
pre vs. early	0.6169
pre vs. late	0.3260
early vs. late	1.0000

Table B.48. Temporal comparison of prevalence of periostitis in adults (N-affected/N-total; prevalence rates)

Time Period	Left Clavicle	Right Clavicle	Left Humerus	Right Humerus
Pre-Urbanization	0/1 0	0/1 0	0/0	0/0
Early Urbanization	1/2 0.50	1/3 0.33	0/0	0/0
Late Urbanization	0/1 0	0/2 0	0/0	0/0
p-value (chi-square)	n/a	n/a	n/a	n/a
p-value (Fisher's exact)			n/a	n/a
pre vs. early	1.0000	1.0000	-	-
pre vs. late	n/a	n/a	-	-
early vs. late	1.0000	1.0000	-	-
Time Period	**Left Radius**	**Right Radius**	**Left Ulna**	**Right Ulna**
Pre-Urbanization	0/0	0/0	0/0	0/0
Early Urbanization	0/0	0/0	0/0	0/0
Late Urbanization	0/0	0/0	0/0	0/0
p-value (chi-square)	n/a	n/a	n/a	n/a
p-value (Fisher's exact)	n/a	n/a	n/a	n/a

Table B.49. Temporal comparison of prevalence of periostitis of upper limbs in adult males (N-affected/N-total; prevalence rate)

Time Period	Left Femur	Right Femur	Left Tibia
Pre-Urbanization	1/2 0.50	1/2 0.50	2/2 1.00
Early Urbanization	0/2 0	1/1 1.00	2/3 0.67
Late Urbanization	0/2 0	0/3 0	3/3 1.00
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)			
pre vs. early	1.0000	1.0000	1.0000
pre vs. late	1.0000	0.4000	n/a
early vs. late	n/a	0.2500	1.0000
Time Period	**Right Tibia**	**Left Fibula**	**Right Fibula**
Pre-Urbanization	2/2 1.00	1/2 0.50	1/2 0.50
Early Urbanization	2/3 0.67	0/2 0	1/2 0.50
Late Urbanization	3/3 1.00	1/2 0.50	0/2 0
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)			
pre vs. early	1.0000	1.0000	1.0000
pre vs. late	n/a	1.0000	1.0000
early vs. late	1.0000	1.0000	1.0000

Table B.50. Temporal comparison of prevalence of periostitis of lower limbs in adult males (N-affected/N-total; prevalence rate)

Time Period	Periostitis
Pre-Urbanization	0/8 0
Early Urbanization	6/26 0.23
Late Urbanization	2/13 0.15
p-value (chi-square)	n/a
p-value (Fisher's exact)	
pre vs. early	0.2975
pre vs. late	0.5048
early vs. late	0.6942

Table B.51. Temporal comparison of prevalence of periostitis in subadults (N-affected/N-total; prevalence rate)

Time Period	Left Clavicle	Right Clavicle	Left Humerus	Right Humerus
Pre-Urbanization	0/0	0/0	0/0	0/0
Early Urbanization	0/0	0/0	0/0	0/0
Late Urbanization	0/0	0/0	0/0	0/0
p-value (chi-square)	n/a	n/a	n/a	n/a
p-value (Fisher's exact)	n/a	n/a	n/a	n/a
Time Period	**Left Radius**	**Right Radius**	**Left Ulna**	**Right Ulna**
Pre-Urbanization	0/0	n/a	0/0	n/a
Early Urbanization	0/0	1/4 0.25	0/0	1/2 0.50
Late Urbanization	0/0	0/2 0	0/0	0/2 0
p-value (chi-square)	n/a	n/a	n/a	n/a
p-value (Fisher's exact)	n/a	1.0000	n/a	1.0000

Table B.52. Temporal comparison of prevalence of periostitis of upper limbs in subadults (N-affected/N-total; prevalence rate)

Time Period	Left Femur	Right Femur	Left Tibia
Pre-Urbanization	0/0	n/a	n/a
Early Urbanization	0/0	1/4 0.25	5/5 1.00
Late Urbanization	0/0	0/2 0	2/2 1.00
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)	n/a	1.0000	n/a
Time Period	**Right Tibia**	**Left Fibula**	**Right Fibula**
Pre-Urbanization	n/a	0/0	0/0
Early Urbanization	5/5 1.00	0/0	0/0
Late Urbanization	2/2 1.00	0/0	0/0
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)	n/a	n/a	n/a

Table B.53. Temporal comparison of prevalence of periostitis of lower limbs in subadults (N-affected/N-total; prevalence rate)

Time Period	Periostitis
Pre-Urbanization	
Females	4/9 0.44
Males	2/11 0.18
p-value (Fisher's exact)	0.3359
Early Urbanization	
Females	6/14 0.43
Males	3/9 0.33
p-value (Fisher's exact)	1.0000
Late Urbanization	
Females	5/11 0.45
Males	3/7 0.43
p-value (Fisher's exact)	1.0000

Table B.54. Temporal comparison of sex differences in prevalence of periostitis (N-affected/N-total; prevalence rate)

Time Period	Left Clavicle	Right Clavicle	Left Humerus	Right Humerus
Pre-Urbanization				
Females	0/0	0/0	0/0	0/0
Males	0/0	0/0	0/0	0/0
p-value (Fisher's exact)	n/a	n/a	n/a	n/a
Early Urbanization				
Females	0/3 0	0/4 0	0/0	0/0
Males	1/2 0.50	1/3 0.33	0/0	0/0
p-value (Fisher's exact)	0.4000	0.4286	n/a	n/a
Late Urbanization				
Females	0/0	0/0	0/0	0/0
Males	0/0	0/0	0/0	0/0
p-value (Fisher's exact)	n/a	n/a	n/a	n/a
Time Period	**Left Radius**	**Right Radius**	**Left Ulna**	**Right Ulna**
Pre-Urbanization				
Females	0/0	0/0	0/0	0/0
Males	0/0	0/0	0/0	0/0
p-value (Fisher's exact)	n/a	n/a	n/a	n/a

Table B.55. Temporal comparison of sex differences in prevalence of periostitis of upper limbs (N-affected/N-total; prevalence rate)

Continued

Table B.55 continued				
Early Urbanization				
Females	0/0	0/0	0/0	0/0
Males	0/0	0/0	0/0	0/0
p-value (Fisher's exact)	n/a	n/a	n/a	n/a
Late Urbanization				
Females	1/4 0.25	0/0	1/4 0.25	0/0
Males	0/2 0	0/0	0/2 0	0/0
p-value (Fisher's exact)	1.0000	n/a	1.0000	n/a

Time Period	**Left Femur**	**Right Femur**	**Left Tibia**
Pre-Urbanization			
Females	0/2 0	0/4 0	3/3 1.00
Males	1/2 0.50	1/2 0.50	2/2 1.00
p-value (Fisher's exact)	1.0000	0.3333	n/a
Early Urbanization			
Females	0/0	0/4 0	6/6 1.00
Males	0/0	1/1 1.00	2/3 0.67
p-value (Fisher's exact)	n/a	0.2000	0.3333
Late Urbanization			
Females	1/5 0.20	0/0	5/5 1.00
Males	0/2 0	0/0	3/3 1.00
p-value (Fisher's exact)	1.0000	n/a	n/a
Time Period	**Right Tibia**	**Left Fibula**	**Right Fibula**
Pre-Urbanization			
Females	4/4 1.00	0/3 0	1/3 0.33
Males	2/2 1.00	1/2 0.50	1/2 0.50
p-value (Fisher's exact)	n/a	0.4000	1.0000

Table B.56. Temporal comparison of sex differences in prevalence of periostitis of lower limbs (N-affected/N-total; prevalence rate)

Continued

Table B.56 continued

Early Urbanization			
Females	6/6 1.00	1/6 0.17	1/5 0.20
Males	2/3 0.67	0/2 0	1/2 0.50
p-value	0.3333	1.0000	1.0000
Late Urbanization			
Females	4/4 1.00	1/4 0.25	1/4 0.25
Males	3/3 1.00	1/2 0.50	0/2 0
p-value	n/a	1.0000	1.0000

Time Period	Periostitis
Pre-Urbanization	
Adult	10/26 0.38
Subadult	0/8 0
p-value (Fisher's exact)	0.0720
Early Urbanization	
Adult	14/33 0.42
Subadult	6/26 0.23
p-value (Fisher's exact)	0.1678
Late Urbanization	
Adult	11/24 0.46
Subadult	2/14 0.14
p-value (Fisher's exact)	0.0773

Table B.57. Temporal comparison of age differences in prevalence of periostitis (N-affected/N-total; prevalence rate)

Time Period	Left Clavicle	Right Clavicle	Left Humerus	Right Humerus
Pre-Urbanization				
Females	0/5 0	0/6 0	0/5 0	0/7 0
Males	0/0	0/0	0/0	0/0
p-value (Fisher's exact)	n/a	n/a	n/a	n/a
Early Urbanization				
Females	1/5 0.20	1/7 0.14	0/5 0	0/7 0
Males	0/2 0	0/2 0	0/1 0	0/0
p-value (Fisher's exact)	1.0000	1.0000	n/a	n/a
Late Urbanization				
Females	0/6 0	0/7 0	0/7 0	0/6 0
Males	0/1 0	0/2 0	0/2 0	0/2 0
p-value (Fisher's exact)	n/a	n/a	n/a	n/a
Time Period	**Left Radius**	**Right Radius**	**Left Ulna**	**Right Ulna**
Pre-Urbanization				
Females	0/4 0	0/6 0	0/4 0	0/6 0
Males	0/0	0/0	0/0	0/0
p-value (Fisher's exact)	n/a	n/a	n/a	n/a

Table B.58. Temporal comparison of age differences in prevalence of periostitis of upper limbs (N-affected/N-total; prevalence rate)

Continued

Table B.58 continued				
Early Urbanization				
Females	0/5 0	0/6 0	0/5 0	0/6 0
Males	0/1 0	1/4 0.25	0/1 0	1/2 0.50
p-value (Fisher's exact)	n/a	0.4000	n/a	0.2500
Late Urbanization				
Females	1/8 0.13	0/5 0	1/8 0.13	0/6 0
Males	0/2 0	0/2 0	0/2 0	0/2 0
p-value (Fisher's exact	1.0000	n/a	1.0000	n/a

Time Period	Left Femur	Right Femur	Left Tibia
Pre-Urbanization			
Females	1/6 0.17	1/8 0.13	7/9 0.78
Males	0/0	0/0	0/0
p-value (Fisher's exact)	n/a	n/a	n/a
Early Urbanization			
Females	0/8 0	1/8 0.13	12/13 0.92
Males	0/4 0	1/4 0.25	5/5 1.00
p-value (Fisher's exact)	n/a	1.0000	1.0000
Late Urbanization			
Females	1/9 0.11	0/8 0	11/11 1.00
Males	0/2 0	0/2 0	2/2 1.00
p-value (Fisher's exact)	1.0000	n/a	n/a
Time Period	**Right Tibia**	**Left Fibula**	**Right Fibula**
Pre-Urbanization			
Females	10/10 1.00	1/9 0.11	2/9 0.22
Males	0/0	0/0	0/0
p-value (Fisher's exact)	n/a	n/a	n/a

Table B.59. Temporal comparison of age differences in prevalence of periostitis of lower limbs (N-affected/N-total; prevalence rate)

Continued

Table B.59 continued			
Early Urbanization			
Females	10/12 0.83	2/11 0.18	3/10 0.30
Males	5/5 1.00	0/5 0	0/4 0
p-value (Fisher's exact)	1.0000	1.0000	0.5055
Late Urbanization			
Females	9/9 1.00	3/9 0.33	1/8 0.13
Males	2/2 1.00	0/2 0	0/0
p-value (Fisher's exact	n/a	1.0000	n/a

Time Period	Left Femur	Left Femur
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization	1/1 1.00	0/1 0
Early Urbanization	0/0 0	0/0 0
Late Urbanization	0/1 0	1/1 1.00

p-values (Fisher's exact)	3
2	
pre vs. early	n/a
pre vs. late	1.0000
early vs. late	n/a

Table B.60. Temporal comparison of severity of periostitis of left femur in adults (N-individuals with severity level/N-total individuals with periostitis; prevalence rate)

Time Period	Left Tibia	Left Tibia	Left Tibia	Left Tibia
	Prevalence of Score of 2	Prevalence of Score of 3	Prevalence of Score of 4	Prevalence of Score of 5
Pre-Urbanization	4/7 0.57	2/7 0.29	1/7 0.14	0/7 0
Early Urbanization	9/12 0.75	2/12 0.17	0/12 0	1/12 0.08
Late Urbanization	6/11 0.55	1/11 0.09	4/11 0.36	0/11 0

p-values (Fisher's exact)	3	4	5
2			
pre vs. early	0.584	0.3571	1.0000
pre vs. late	0.5594	0.6004	n/a
early vs. late	1.0000	0.0867	1.0000
3			
pre vs. early	-	1.0000	1.0000
pre vs. late	-	0.4643	n/a
early vs. late	-	0.1429	1.0000
4			
pre vs. early	-	-	1.0000
pre vs. late	-	-	n/a
early vs. late	-	-	0.2000

Table B.61. Temporal comparison of severity of periostitis of left tibia in adults (N-individuals with severity level/N-total individuals with periostitis; prevalence rate)

Time Period	Right Tibia	Right Tibia	Right Tibia	Right Tibia
	Prevalence of Score of 2	Prevalence of Score of 3	Prevalence of Score of 4	Prevalence of Score of 5
Pre-Urbanization	5/10 0.50	4/10 0.40	0/10 0	1/10 0.10
Early Urbanization	6/10 0.60	3/10 0.30	1/10 0.10	0/10 0
Late Urbanization	5/9 0.56	3/9 0.33	1/9 0.11	0/9 0

p-values (Fisher's exact)	3	4	5
2			
pre vs. early	1.0000	1.0000	1.0000
pre vs. late	1.0000	1.0000	1.0000
early vs. late	1.0000	1.0000	n/a
3			
pre vs. early	-	1.0000	1.0000
pre vs. late	-	1.0000	1.0000
early vs. late	-	1.0000	n/a
4			
pre vs. early	-	-	1.0000
pre vs. late	-	-	1.0000
early vs. late	-	-	n/a

Table B.62. Temporal comparison of severity of periostitis of right tibia in adults (N-individuals with severity level/N-total individuals with periostitis; prevalence rate)

Time Period	Left Fibula	Left Fibula	Left Fibula
	Prevalence of Score of 3	Prevalence of Score of 4	Prevalence of Score of 5
Pre-Urbanization	0/1 0	0/1 0	1/1 1.00
Early Urbanization	0/2 0	1/2 0.50	1/2 0.50
Late Urbanization	2/3 0.67	1/3 0.33	0/3 0

p-values (Fisher's exact)	4	5
3		
pre vs. early	n/a	n/a
pre vs. late	n/a	0.3333
early vs. late	1.0000	0.3333
4		
pre vs. early	-	1.0000
pre vs. late	-	1.0000
early vs. late	-	1.0000

Table B.63. Temporal comparison of severity of periostitis of left fibula in adults (N-individuals with severity level/N-total individuals with periostitis; prevalence rate)

Time Period	Right Fibula	Right Fibula	Right Fibula
	Prevalence of Score of 3	**Prevalence of Score of 4**	**Prevalence of Score of 5**
Pre-Urbanization	1/2 0.50	0/2 0	1/2 0.50
Early Urbanization	0/3 0	2/3 0.67	1/3 0.33
Late Urbanization	0/1 0	1/1 1.00	0/1 0

p-values (Fisher's exact)	4	5
3		
pre vs. early	0.3333	1.0000
pre vs. late	1.0000	n/a
early vs. late	n/a	n/a
4		
pre vs. early	-	1.0000
pre vs. late	-	1.0000
early vs. late	-	1.0000

Table B.64. Temporal comparison of severity of periostitis of right fibula in adults (N-individuals with severity level/N-total individuals with periostitis; prevalence rate)

Time Period	Left Clavice	Right Clavicle	Left Humerus	Right Humerus
	Prevalence of Score of 4	Prevalence of Score of 4	None	None
Pre-Urbanization	0/0 0	0/0 0	0/0	0/0
Early Urbanization	1/1 1.00	1/1 1.00	0/0	0/0
Late Urbanization	0/0 0	0/0 0	0/0	0/0
p-value (chi-square)	n/a	n/a	n/a	n/a
p-value (Fisher's exact)	n/a	n/a	n/a	n/a
Time Period	**Left Radius**	**Right Radius**	**Left Ulna**	**Right Ulna**
	Prevalence of Score of 3	**None**	**Prevalence of Score of3**	**None**
Pre-Urbanization	0/0 0	0/0	0/0 0	0/0
Early Urbanization	0/0 0	0/0	0/0 0	0/0
Late Urbanization	1/1 1.00	0/0	1/1 1.00	0/0
p-value (chi-square)	n/a	n/a	n/a	n/a
p-value (Fisher's exact)	n/a	n/a	n/a	n/a

Table B.65. Temporal comparison of severity of periostitis of various skeletal elements in adults (N-individuals with severity level/N-total individuals with periostitis; prevalence rate)

Continued

Table B.65 continued	
Time Period	**Right Femur**
	Prevalence of Score of 2
Pre-Urbanization	1/1 1.00
Early Urbanization	1/1 1.00
Late Urbanization	0/0 0
p-value (chi-square)	n/a
p-value (Fisher's exact)	n/a

Time Period	Left Tibia	Left Tibia	Left Tibia	Left Tibia
	Prevalence of Score of 2	Prevalence of Score of 3	Prevalence of Score of 4	Prevalence of Score of 5
Pre-Urbanization	1/3 0.33	2/3 0.67	0/3 0	0/3 0
Early Urbanization	4/6 0.67	1/6 0.17	0/6 0	1/6 0.17
Late Urbanization	3/5 0.60	0/5 0	2/5 0.40	0/5 0

p-values (Fisher's exact)	3	4	5
2			
pre vs. early	0.46443	n/a	1.0000
pre vs. late	0.4000	1.0000	n/a
early vs. late	1.0000	0.4444	1.0000
3			
pre vs. early	-	n/a	1.0000
pre vs. late	-	0.3333	n/a
early vs. late	-	0.3333	n/a
4			
pre vs. early	-	-	n/a
pre vs. late	-	-	n/a
early vs. late	-	-	0.3333

Table B.66. Temporal comparison of severity of periostitis of left tibia in adult females (N-individuals with severity level/N-total individuals with periostitis; prevalence rate)

Time Period	Right Tibia	Right Tibia	Right Tibia
	Prevalence of Score of 2	Prevalence of Score of 3	Prevalence of Score of 4
Pre-Urbanization	2/4 0.50	2/4 0.50	0/2 0
Early Urbanization	4/6 0.67	1/6 0.17	1/6 0.17
Late Urbanization	0/4 0	3/4 0.75	1/4 0.25

p-values (Fisher's exact)	3	4
2		
pre vs. early	0.5238	1.0000
pre vs. late	0.4286	0.3333
early vs. late	0.1429	0.3333
3		
pre vs. early	-	1.0000
pre vs. late	-	1.0000
early vs. late	-	1.0000

Table B.67. Temporal comparison of severity of periostitis of right tibia in adult females (N-individuals with severity level/N-total individuals with periostitis; prevalence rate)

Time Period	Left Fibula	Left Fibula
	Prevalence of Score of 4	Prevalence of Score of 5
Pre-Urbanization	0/0 0	0/0 0
Early Urbanization	0/1 0	1/1 1.00
Late Urbanization	1/1 1.00	0/1 0

p-values (Fisher's exact)	5
4	
pre vs. early	n/a
pre vs. late	n/a
early vs. late	1.0000

Table B.68. Temporal comparison of severity of periostitis of left fibula in adult females (N-individuals with severity level/N-total individuals with periostitis; prevalence rate)

Time Period	Right Fibula	Right Fibula	Right Fibula
	Prevalence of Score of 3	**Prevalence of Score of 4**	**Prevalence of Score of 5**
Pre-Urbanization	1/1 1.00	0/1 0	0/1 0
Early Urbanization	0/1 0	0/1 0	1/1 1.00
Late Urbanization	0/1 0	1/1 1.00	0/1 0

p-values (Fisher's exact)	4	5
3		
pre vs. early	n/a	1.0000
pre vs. late	1.0000	n/a
early vs. late	n/a	n/a
4		
pre vs. early	-	n/a
pre vs. late	-	n/a
early vs. late	-	1.0000

Table B.69. Temporal comparison of severity of periostitis of right fibula in adult females (N-individuals with severity level/N-total individuals with periostitis; prevalence rate)

Time Period	Left Clavicle	Right Clavicle	Left Humerus	Right Humerus
	None	**None**	**None**	**None**
Pre-Urbanization	0/0	0/0	0/0	0/0
Early Urbanization	0/0	0/0	0/0	0/0
Late Urbanization	0/0	0/0	0/0	0/0
p-value (chi-square)	n/a	n/a	n/a	n/a
p-value (Fisher's exact)	n/a	n/a	n/a	n/a
Time Period	**Left Radius**	**Right Radius**	**Left Ulna**	**Right Ulna**
	Prevalence of Score of 3	**None**	**Prevalence of Score of 3**	**None**
Pre-Urbanization	0/0 0	0/0	0/0 0	0/0
Early Urbanization	0/0 0	0/0	0/0 0	0/0
Late Urbanization	1/1 1.00	0/0	1/1 1.00	0/0
p-value (chi-square)	n/a	n/a	n/a	n/a
p-value (Fisher's exact)	n/a	n/a	n/a	n/a

Table B.70. Temporal comparison of severity of periostitis of various skeletal elements in adult females (N-individuals with severity level/N-total individuals with periostitis; prevalence rate)

Continued

Table B.70 continued		
Time Period	**Left Femur**	**Right Femur**
	Prevalence of Score of 3	**None**
Pre-Urbanization	0/0 0	0/0
Early Urbanization	0/0 0	0/0
Late Urbanization	1/1 1.00	0/0
p-value (chi-square)	n/a	n/a
p-value (Fisher's exact)	n/a	n/a

Time Period	Left Tibia	Left Tibia	Left Tibia
	Prevalence of Score of 2	**Prevalence of Score of 3**	**Prevalence of Score of 4**
Pre-Urbanization	1/2 0.50	0/2 0	1/2 0.50
Early Urbanization	1/2 0.50	1/2 0.50	0/2 0
Late Urbanization	2/3 0.67	0/3 0	1/3 0.33

p-values (Fisher's exact)	3	4
2		
pre vs. early	1.0000	1.0000
pre vs. late	n/a	1.0000
early vs. late	1.0000	1.0000
3		
pre vs. early	-	1.0000
pre vs. late	-	n/a
early vs. late	-	1.0000

Table B.71. Temporal comparison of severity of periostitis of left tibia in adult males (N-individuals with severity level/N-total individuals with periostitis; prevalence rate)

Time Period	Right Tibia	Right Tibia	Right Tibia
	Prevalence of Score of 2	**Prevalence of Score of 3**	**Prevalence of Score of 5**
Pre-Urbanization	1/2 0.50	0/2 0	1/2 0.50
Early Urbanization	1/2 0.50	1/2 0.50	0/2 0
Late Urbanization	3/3 1.00	0/3 0	0/3 0

p-values (Fisher's exact)	3	5
2		
pre vs. early	1.0000	1.0000
pre vs. late	n/a	0.4000
early vs. late	0.4000	n/a
3		
pre vs. early	-	1.0000
pre vs. late	-	n/a
early vs. late	-	n/a

Table B.72. Temporal comparison of severity of periostitis of right tibia in adult males (N-individuals with severity level/N-total individuals with periostitis; prevalence rate)

Time Period	Left Fibula	Left Fibula
	Prevalence of Score of 3	**Prevalence of Score of 5**
Pre-Urbanization	0/1 0	1/1 1.00
Early Urbanization	0/0 0	0/0 0
Late Urbanization	1/1 1.00	0/1 0

p-values (Fisher's exact)	5
3	
pre vs. early	n/a
pre vs. late	1.0000
early vs. late	n/a

Table B.73. Temporal comparison of severity of periostitis of left fibula in adult males (N-individuals with severity level/N-total individuals with periostitis; prevalence rate)

Time Period	Right Fibula	Right Fibula
	Prevalence of Score of 4	Prevalence of Score of 5
Pre-Urbanization	0/1 0	1/1 1.00
Early Urbanization	1/1 1.00	0/1 0
Late Urbanization	0/0 0	0/0 0

p-values (Fisher's exact)	5
4	
pre vs. early	1.0000
pre vs. late	n/a
early vs. late	n/a

Table B.74. Temporal comparison of severity of periostitis of right fibula in adult males (N-individuals with severity level/N-total individuals with periostitis; prevalence rate)

Time Period	Left Clavicle	Right Clavicle	Left Humerus	Right Humerus
	Prevalence of Score of 4	Prevalence of Score of 4	None	None
Pre-Urbanization	0/0 0	0/0 0	0/0	0/0
Early Urbanization	1/1 1.00	1/1 1.00	0/0	0/0
Late Urbanization	0/0 0	0/0 0	0/0	0/0
p-value (chi-square)	n/a	n/a	n/a	n/a
p-value (Fisher's exact)	n/a	n/a	n/a	n/a
Time Period	**Left Radius**	**Right Radius**	**Left Ulna**	**Right Ulna**
	None	**None**	**None**	**None**
Pre-Urbanization	0/0	0/0	0/0	0/0
Early Urbanization	0/0	0/0	0/0	0/0
Late Urbanization	0/0	0/0	0/0	0/0
p-value (chi-square)	n/a	n/a	n/a	n/a
p-value (Fisher's exact)	n/a	n/a	n/a	n/a

Table B.75. Temporal comparison of severity of periostitis of various skeletal elements in adult males (N-individuals with severity level/N-total individuals with periostitis; prevalence rate)

Continued

Table B.75 continued

Time Period	Left Femur	Right Femur
	Prevalence of Score of 2	**Prevalence of Score of 2**
Pre-Urbanization	1/1 1.00	1/1 1.00
Early Urbanization	0/0 0	1/1 1.00
Late Urbanization	0/0 0	0/0 0
p-value (chi-square)	n/a	n/a
p-value (Fisher's exact)	n/a	n/a

Time Period	**Left Tibia**	**Left Tibia**
	Prevalence of Score of 2	**Prevalence of Score of 3**
Pre-Urbanization	n/a	n/a
Early Urbanization	1/5 0.20	4/5 0.80
Late Urbanization	1/2 0.50	1/2 0.50

p-values (Fisher's exact)	**3**
2	
pre vs. early	n/a
pre vs. late	n/a
early vs. late	1.0000

Table B.76. Temporal comparison of severity of periostitis of left tibia in subadults (N-individuals with severity level/N-total individuals with periostitis; prevalence rate)

Time Period	Right Tibia	Right Tibia	Right Tibia
	Prevalence of Score of 2	**Prevalence of Score of 3**	**Prevalence of Score of 4**
Pre-Urbanization	n/a	n/a	n/a
Early Urbanization	1/5 0.20	4/5 0.80	0/5 0
Late Urbanization	0/2 0	1/2 0.50	1/2 0.50

p-values (Fisher's exact)	3	4
2		
pre vs. early	n/a	n/a
pre vs. late	n/a	n/a
early vs. late	1.0000	1.0000
3		
pre vs. early	-	n/a
pre vs. late	-	n/a
early vs. late	-	0.3333

Table B.77. Temporal comparison of severity of periostitis of right tibia in subadults (N-individuals with severity level/N-total individuals with periostitis; prevalence rate)

Time Period	Left Clavicle	Right Clavicle	Left Humerus	Right Humerus
	None	None	None	None
Pre-Urbanization	0/0	0/0	0/0	0/0
Early Urbanization	0/0	0/0	0/0	0/0
Late Urbanization	0/0	0/0	0/0	0/0
p-value (chi-square)	n/a	n/a	n/a	n/a
p-value (Fisher's exact)	n/a	n/a	n/a	n/a
Time Period	**Left Radius**	**Right Radius**	**Left Ulna**	**Right Ulna**
	None	**Prevalence of Score of 2**	**None**	**Prevalence of Score of 2**
Pre-Urbanization	0/0	n/a	0/0	n/a
Early Urbanization	0/0	1/1 1.00	0/0	1/1 1.00
Late Urbanization	0/0	0/0 0	0/0	0/0 0
p-value (chi-square)	n/a	n/a	n/a	n/a
p-value (Fisher's exact)	n/a	n/a	n/a	n/a

Table B.78. Temporal comparison of severity of periostitis of various skeletal elements in subadults (N-individuals with severity level/N-total individuals with periostitis; prevalence rate)

Continued

Table B.78 continued

	Left Femur	Right Femur	Left Fibula	Right Fibula
Time Period	**None**	**Prevalence of Score of 2**	**None**	**None**
Pre-Urbanization	0/0	n/a	0/0	0/0
Early Urbanization	0/0	1/1 1.00	0/0	0/0
Late Urbanization	0/0	0/0 0	0/0	0/0
p-value (chi-square)	n/a	n/a	n/a	n/a
p-value (Fisher's exact)	n/a	n/a	n/a	n/a

Time Period	Left Tibia	Left Tibia	Left Tibia	Left Tibia
	Prevalence of Score of 2	**Prevalence of Score of 3**	**Prevalence of Score of 4**	**Prevalence of Score of 5**
Pre-Urbanization				
Females	1/3 0.33	2/3 0.67	0/3 0	n/a
Males	1/2 0.50	0/2 0	1/2 0.50	n/a
Early Urbanization				
Females	4/6 0.67	1/6 0.17	n/a	1/6 0.17
Males	1/2 0.50	1/2 0.50	n/a	0/2 0
Late Urbanization				
Females	3/5 0.60	n/a	2/5 0.40	n/a
Males	2/3 0.67	n/a	1/3 0.33	n/a

p-values (Fisher's Exact) Pre-Urbanization	**3**	**4**
2	1.0000	1.0000
3	-	0.3333
p-values (Fisher's Exact) Early Urbanization	**3**	**5**
2	1.0000	1.0000
3	-	1.0000
p-values (Fisher's Exact) Late Urbanization	**4**	-
2	1.0000	-

Table B.79. Temporal comparison of sex differences in severity of periostitis of left tibia (N-individuals with severity level/N-total individuals with periostitis; prevalence rate)

Time Period	Right Tibia	Right Tibia	Right Tibia	Right Tibia
	Prevalence of Score of 2	**Prevalence of Score of 3**	**Prevalence of Score of 4**	**Prevalence of Score of 5**
Pre-Urbanization				
Females	2/4 0.50	2/4 0.50	n/a	0/4 0
Males	1/2 0.50	0/2 0	n/a	1/2 0.50
Early Urbanization				
Females	4/6 0.67	1/6 0.17	1/6 0.17	n/a
Males	1/2 0.50	1/2 0.50	0/2 0	n/a
Late Urbanization				
Females	0/4 0	3/4 0.75	1/4 0.25	n/a
Males	3/3 1.00	0/3 0	0/3 0	n/a

p-values (Fisher's Exact) Pre-Urbanization	**3**	**5**
2	1.0000	1.0000
3	-	0.3333
p-values (Fisher's Exact) Early Urbanization	**3**	**4**
2	1.0000	1.0000
3	-	1.0000
p-values (Fisher's Exact) Late Urbanization	**3**	**4**
2	0.1000	0.2500
3	-	n/a

Table B.80. Temporal comparison of sex differences in severity of periostitis of right tibia (N-individuals with severity level/N-total individuals with periostitis; prevalence rate)

Time Period	Left Fibula	Left Fibula	Left Fibula
	Prevalence of Score of 3	Prevalence of Score of 4	Prevalence of Score of 5
Pre-Urbanization			
Females	n/a	n/a	0/0 0
Males	n/a	n/a	1/1 1.00
Early Urbanization			
Females	n/a	n/a	1/1 1.00
Males	n/a	n/a	0/0 0
Late Urbanization			
Females	0/1 0	1/1 1.00	n/a
Males	1/1 1.00	0/1 0	n/a

p-values (Fisher's Exact) Late Urbanization	4
3	1.0000

Table B.81. Temporal comparison of sex differences in severity of periostitis of left fibula (N-individuals with severity level/N-total individuals with periostitis; prevalence rate)

Time Period	Right Fibula	Right Fibula	Right Fibula
	Prevalence of Score of 3	Prevalence of Score of 4	Prevalence of Score of 5
Pre-Urbanization			
Females	1/1 1.00	n/a	0/1 0
Males	0/1 0	n/a	1/1 1.00
Early Urbanization			
Females	n/a	0/1 0	1/1 1.00
Males	n/a	1/1 1.00	0/1 0
Late Urbanization			
Females	n/a	1/1 1.00	n/a
Males	n/a	0/0 0	n/a

p-values (Fisher's Exact) Pre-Urbanization	5
3	1.0000
p-values (Fisher's Exact) Early Urbanization	**5**
4	1.0000

Table B.82. Temporal comparison of sex differences in severity of periostitis of right fibula (N-individuals with severity level/N-total individuals with periostitis; prevalence rate)

Time Period	Left Clavicle	Right Clavicle	Left Humerus	Right Humerus
	Prevalence of Score of 4	**Prevalence of Score of 4**	**None**	**None**
Pre-Urbanization				
Females	0/0	0/0	0/0	0/0
Males	0/0	0/0	0/0	0/0
p-value	n/a	n/a	n/a	n/a
Early Urbanization				
Females	0/0 0	0/0 0	0/0	0/0
Males	1/1 1.00	1/1 1.00	0/0	0/0
p-value	n/a	n/a	n/a	n/a
Late Urbanization				
Females	0/0	0/0	0/0	0/0
Males	0/0	0/0	0/0	0/0
p-value	n/a	n/a	n/a	n/a

Table B.83. Temporal comparison of sex differences in severity of periostitis of various skeletal elements (N-individuals with severity level/N-total individuals with periostitis; prevalence rate)

Continued

Table B.83 continued				
Time Period	**Left Radius**	**Right Radius**	**Left Ulna**	**Right Ulna**
	Prevalence of Score of 3	**None**	**Prevalence of Score of 3**	**None**
Pre-Urbanization				
Females	0/0	0/0	0/0	0/0
Males	0/0	0/0	0/0	0/0
p-value	n/a	n/a	n/a	n/a
Early Urbanization				
Females	0/0	0/0	0/0	0/0
Males	0/0	0/0	0/0	0/0
p-value	n/a	n/a	n/a	n/a
Late Urbanization				
Females	1/1 1.00	0/0	1/1 1.00	0/0
Males	0/0 0	0/0	0/0 0	0/0
p-value	n/a	n/a	n/a	n/a

Continued

Table B.83 continued			
Time Period	**Left Femur**	**Left Femur**	**Right Femur**
	Prevalence of Score of 2	**Prevalence of Score of 3**	**Prevalence of Score of 2**
Pre-Urbanization			
Females	0/0 0	0/0	0/4 0
Males	1/1 1.00	0/0	1/2 0.50
p-value	1.0000	n/a	n/a
Early Urbanization			
Females	0/0	0/0	0/4 0
Males	0/0	0/0	1/1 1.00
p-value	n/a	n/a	n/a
Late Urbanization			
Females	0/0	1/5 0.20	0/0
Males	0/0	0/2 0	0/0
p-value	n/a	n/a	n/a

Time Period	Left Tibia	Left Tibia	Left Tibia	Left Tibia
	Prevalence of Score of 2	**Prevalence of Score of 3**	**Prevalence of Score of 4**	**Prevalence of Score of 5**
Pre-Urbanization				
Adults	4/7 0.57	2/7 0.29	0	1/7 0.14
Subadults	0	0	0	0
Early Urbanization				
Adults	9/12 0.75	2/12 0.17	0	1/12 0.08
Subadults	1/5 0.20	4/5 0.80	0	0
Late Urbanization				
Adults	6/11 0.55	1/11 0.09	4/11 0.36	0
Subadults	1/2 0.50	1/2 0.50	0	0

p-values (Fisher's Exact) Early Urbanization	3	5
2	0.0357*	1.0000
3	-	0.4286
p-values (Fisher's Exact) Late Urbanization	3	4
2	0.4167	1.0000
3	-	0.3333

Table B.84. Temporal comparison of age differences in severity of periostitis of left tibia (*significant, p≤0.05) (N-individuals with severity level/N-total individuals with periostitis; prevalence rate)

Time Period	Right Tibia	Right Tibia	Right Tibia
	Prevalence of Score of 2	Prevalence of Score of 3	Prevalence of Score of 4
Pre-Urbanization			
Adults	5/10 0.50	4/10 0.40	1/10 0.10
Subadults	0	0	0
Early Urbanization			
Adults	6/10 0.60	3/10 0.30	1/10 0.10
Subadults	1/5 0.20	4/5 0.80	0
Late Urbanization			
Adults	4/9 0.56	3/9 0.33	1/9 0.11
Subadults	0	1/2 0.50	1/2 0.50

p-values (Fisher's Exact) Early Urbanization	**3**	**4**
2	0.2657	1.0000
3	-	1.0000
p-values (Fisher's Exact) Late Urbanization	**3**	**4**
2	0.4444	0.2857
3	-	1.0000

Table B.85. Temporal comparison of age differences in severity of periostitis of right tibia (N-individuals with severity level/N-total individuals with periostitis; prevalence rate)

Time Period	Left Fibula	Left Fibula	Left Fibula
	Prevalence of Score of 3	**Prevalence of Score of 4**	**Prevalence of Score of 5**
Pre-Urbanization			
Adults	0	0	1/1 1.00
Subadults	0	0	0
Early Urbanization			
Adults	0	1/2 0.50	1/2 0.50
Subadults	0	0	0
Late Urbanization			
Adults	2/3 0.67	1/3 0.33	0
Subadults	0	0	0

Table B.86. Temporal comparison of age differences in severity of periostitis of left fibula (N-individuals with severity level/N-total individuals with periostitis; prevalence rate)

Time Period	Right Fibula	Right Fibula	Right Fibula
	Prevalence of Score of 3	Prevalence of Score of 4	Prevalence of Score of 5
Pre-Urbanization			
Adults	1/2 0.50	0	1/2 0.50
Subadults	0	0	0
Early Urbanization			
Adults	0	2/3 0.67	1/3 0.33
Subadults	0	0	0
Late Urbanization			
Adults	0	1/1 1.00	0
Subadults	0	0	0

Table B.87. Temporal comparison of age differences in severity of periostitis of right fibula (N-individuals with severity level/N-total individuals with periostitis; prevalence rate)

Time Period	Left Clavice	Right Clavicle	Left Humerus	Right Humerus
	Prevalence of Score of 4	Prevalence of Score of 4	None	None
Pre-Urbanization				
Adults	0/0	0/0	0/0	0/0
Subadults	0/0	0/0	0/0	0/0
p-value (Fisher's exact)	n/a	n/a	n/a	n/a
Early Urbanization				
Adults	1/5 0.20	1/7 0.14	0/0	0/0
Subadults	0/2 0/9	0/2 0	0/0	0/0
p-value (Fisher's exact)	1.0000	1.0000	n/a	n/a
Late Urbanization				
Adults	0/0	0/0	0/0	0/0
Subadults	0/0	0/0	0/0	0/0
p-value (Fisher's exact)	n/a	n/a	n/a	n/a

Table B.88. Temporal comparison of age differences in severity of periostitis of various skeletal elements (N-individuals with severity level/N-total individuals with periostitis; prevalence rate)

Continued

Table B.88 continued				
	Left Radius	**Right Radius**	**Left Ulna**	**Right Ulna**
Time Period	**Prevalence of Score of 3**	**Prevalence of Score of 2**	**Prevalence of Score of 3**	**Prevalence of Score of 2**
Pre-Urbanization				
Adults	0/0	0/0	0/0	0/0
Subadults	0/0	0/0	0/0	0/0
p-value (Fisher's exact)	n/a	n/a	n/a	n/a
Early Urbanization				
Adults	0/0	0/6 0	0/0	0/6 0
Subadults	0/0	1/4 0.25	0/0	1/2 0.50
p-value (Fisher's exact)	n/a	0.4000	n/a	0.2500
Late Urbanization				
Adults	1/8 0.13	0/0	1/8 0.13	0/0
Subadults	0/2 0	0/0	0/2 0	0/0
p-value (Fisher's exact)	1.0000	n/a	1.0000	n/a

Continued

Table B.88 continued		
Time Period	**Left Femur**	**Right Femur**
	Prevalence of Score of 3	**Prevalence of Score of 2**
Pre-Urbanization		
Adults	0/0	0/0
Subadults	0/0	0/0
p-value (Fisher's exact)	n/a	n/a
Early Urbanization		
Adults	0/0	1/8 0.13
Subadults	0/0	1/4 0.25
p-value (Fisher's exact)	n/a	1.0000
Late Urbanization		
Adults	1/9 0.11	0/0
Subadults	0/2 0	0/0
p-value (Fisher's exact)	1.0000	n/a

Time Period	**Tuberculosis - Vertebrae**	**Tuberculosis – Ribs**	**Treponemal Lesion**
Pre-Urbanization	0/15 0	0/18 0	0/19 0
Early Urbanization	0/27 0	1/29 0.03	0/22 0
Late Urbanization	0/17 0	0/20 0	0/20 0
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)	n/a		n/a
pre vs. early	-	1.0000	-
pre vs. late	-	n/a	-
early vs. late	-	1.0000	-
Time Period	**Nasopharyngeal Lesion**	**Leprosy - Hands**	**Leprosy - Feet**
Pre-Urbanization	0/14 0	1/19 0.05	1/18 0.06
Early Urbanization	1/18 0.06	0/24 0	2/27 0.07
Late Urbanization	0/17 0	0/14 0	1/15 0.07
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)			
pre vs. early	1.0000	0.4419	1.0000
pre vs. late	n/a	1.0000	1.0000
early vs. late	1.0000	n/a	1.0000

Table B.89. Temporal comparison of prevalence of infectious diseases in adults (N-affected/N-total; prevalence rate)

Time Period	**Tuberculosis - Vertebrae**	**Tuberculosis - Ribs**	**Treponemal Lesion**
Pre-Urbanization	0/7 0	0/7 0	0/9 0
Early Urbanization	0/14 0	0/13 0	0/12 0
Late Urbanization	0/9 0	0/11 0	0/12 0
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)	n/a	n/a	n/a
Time Period	**Nasopharyngeal Lesion**	**Leprosy - Hands**	**Leprosy - Feet**
Pre-Urbanization	0/7 0	0/6 0	0/6 0
Early Urbanization	1/8 0.13	0/11 0	1/11 0.09
Late Urbanization	0/12 0	0/8 0	1/9 0.11
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)		n/a	
pre vs. early	1.0000	-	1.0000
pre vs. late	n/a	-	1.0000
early vs. late	0.4000	-	1.0000

Table B.90. Temporal comparison of prevalence of infectious diseases in adult females (N-affected/N-total; prevalence rate)

Time Period	**Tuberculosis - Vertebrae**	**Tuberculosis – Ribs**	**Treponemal Lesion**
Pre-Urbanization	0/7 0	0/8 0	0/7 0
Early Urbanization	0/9 0	1/9 0.11	0/8 0
Late Urbanization	0/5 0	0/7 0	0/5 0
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)	n/a		n/a
pre vs. early	-	1.0000	-
pre vs. late	-	n/a	-
early vs. late	-	1.0000	-
Time Period	**Nasopharyngeal Lesion**	**Leprosy - Hands**	**Leprosy - Feet**
Pre-Urbanization	0/6 0	1/9 0.11	1/6 0.17
Early Urbanization	0/8 0	0/7 0	1/7 0.14
Late Urbanization	0/3 0	0/4 0	0/2 0
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)	n/a		
pre vs. early	-	1.0000	1.0000
pre vs. late	-	1.0000	1.0000
early vs. late	-	n/a	1.0000

Table B.91. Temporal comparison of prevalence of infectious diseases in adult males (N-affected/N-total; prevalence rate)

Time Period	Tuberculosis-Ribs	Nasopharyngeal Lesion	Leprosy - Hands	Leprosy - Feet
Pre-Urbanization				
Females	0/7 0	0/7 0	0/6 0	0/6 0
Males	0/8 0	0/6 0	1/9 0.11	1/6 0.17
p-value (Fisher's exact)	n/a	n/a	1.0000	1.0000
Early Urbanization				
Females	0/13 0	1/8 0.13	0/11 0	1/11 0.09
Males	1/9 0.11	0/8 0	0/7 0	1/7 0.14
p-value (Fisher's exact)	0.4091	1.0000	n/a	1.0000
Late Urbanization				
Females	0/11 0	0/12 0	0/8 0	1/9 0.11
Males	0/7 0	0/3 0	0/4 0	0/2 0
p-value (Fisher's exact)	n/a	n/a	n/a	1.0000

Table B.92 Temporal comparison of sex differences in prevalence of infectious diseases (N-affected/N-total; prevalence rate)

Time Period	Tuberculosis – Vertebrae	Tuberculosis – Ribs	Treponemal Lesions
Pre-Urbanization			
Adult	0/15 0	0/18 0	0/19 0
Subadult	0/5 0	0/9 0	0/8 0
p-value (Fisher's exact)	n/a	n/a	n/a
Early Urbanization			
Adult	0/27 0	1/29 0.03	0/22 0
Subadult	0/19 0	0/25 0	0/20 0
p-value (Fisher's exact)	n/a	1.0000	n/a
Late Urbanization			
Adult	0/17 0	0/20 0	0/20 0
Subadult	0/9 0	0/13 0	0/13 0
p-value (Fisher's exact)	n/a	n/a	n/a
Time Period	**Nasopharyngeal Lesion**	**Leprosy - Hands**	**Leprosy - Feet**
Pre-Urbanization			
Adult	0/14 0	1/19 0.05	1/18 0.06
Subadult	0/6 0	0/2 0	0/2 0
p-value (Fisher's exact)	n/a	1.0000	1.0000

Table B.93. Temporal comparison of age differences in prevalence of infectious diseases (N-affected/N-total; prevalence rate)

Continued

Table B.93 continued			
Early Urbanization			
Adult	1/18 0.06	0/24 0	2/27 0.07
Subadult	0/15 0	0/12 0	0/14 0
p-value	1.0000	n/a	0.5390
Late Urbanization			
Adult	0/17 0	0/14 0	1/15 0.07
Subadult	0/9 0	0/9 0	0/4 0
p-value	n/a	n/a	1.0000

Time Period	Caries	Antemortem Tooth Loss	Periapical Lesion	Calculus
Pre-Urbanization	8/21 0.38	12/21 0.57	7/21 0.33	17/22 0.77
Early Urbanization	11/24 0.46	15/23 0.65	6/23 0.26	14/24 0.58
Late Urbanization	8/18 0.44	9/19 0.47	5/19 0.26	15/18 0.83
p-value (chi-square)	0.8608	0.5083	0.8393	n/a
p-value (Fisher's exact)				
pre vs. early	-	-	-	0.2172
pre vs. late	-	-	-	0.7089
early vs. late	-	-	-	0.1038

Table B.94. Temporal comparison of prevalence of dental pathological conditions in adults (N-affected/N-total; prevalence rate)

Time Period	Incisor	Canine	Premolar	Molar
Pre-Urbanization	1/19 0.05	1/19 0.05	3/20 0.15	8/21 0.38
Early Urbanization	0/18 0	0/19 0	5/18 0.28	10/21 0.48
Late Urbanization	1/14 0.07	2/14 0.14	3/16 0.19	7/17 0.41
p-value (chi-square)	n/a	n/a	n/a	n/a
p-value (Fisher's exact)				
pre vs. early	1.0000	1.0000	0.4381	0.7557
pre vs. late	1.0000	0.5612	1.0000	1.0000
early vs. late	0.4375	0.1723	0.6933	0.7517

Table B.95. Temporal comparison of prevalence of carious lesions by tooth class in adults (N-affected/N-total; prevalence rate)

Time Period	Occlusal	Mesial	Distal
Pre-Urbanization	9/9 1.00	3/9 0.33	5/9 0.56
Early Urbanization	8/11 0.73	5/11 0.45	6/11 0.55
Late Urbanization	5/8 0.63	2/8 0.25	4/8 0.50
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)			
pre vs. early	0.2184	0.6699	1.0000
pre vs. late	0.0824	1.0000	1.0000
early vs. late	1.0000	0.6332	1.0000
Time Period	**Buccal**	**Lingual**	**Cervical**
Pre-Urbanization	0/9 0	0/9 0	4/9 0.44
Early Urbanization	3/11 0.27	2/11 0.18	8/11 0.73
Late Urbanization	1/8 0.13	0/8 0	5/8 0.63
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)			
pre vs. early	0.2184	0.4789	0.3618
pre vs. late	0.4706	n/a	0.6372
early vs. late	0.6027	0.4854	1.0000

Table B.96. Temporal comparison of prevalence of carious lesions by tooth surface in adults (N-individuals with tooth surface affected/N-total individuals with caries; prevalence rate)

Time Period	**Caries**	**Antemortem Tooth Loss**	**Periapical Lesion**	**Calculus**
Pre-Urbanization	3/8 0.38	3/9 0.33	5/9 0.56	8/9 0.89
Early Urbanization	5/12 0.42	9/12 0.75	2/12 0.17	6/12 0.50
Late Urbanization	6/11 0.55	6/12 0.50	3/12 0.25	9/11 0.82
p-value (chi-square)	n/a	n/a	n/a	n/a
p-value (Fisher's exact)				
pre vs. early	1.0000	0.0872	0.1588	0.1588
pre vs. late	0.6499	0.6605	0.2031	1.0000
early vs. late	0.6843	0.4003	1.0000	0.1930

Table B.97. Temporal comparison of prevalence of dental pathological conditions in adult females (N-affected/N-total; prevalence rate)

Time Period	Incisor	Canine	Premolar	Molar
Pre-Urbanization	1/8 0.13	1/9 0.11	2/9 0.22	3/9 0.33
Early Urbanization	0/9 0	0/10 0	3/8 0.38	4/9 0.44
Late Urbanization	1/8 0.13	2/8 0.25	2/9 0.22	5/10 0.50
p-value (chi-square)	n/a	n/a	n/a	n/a
p-value (Fisher's exact)				
pre vs. early	0.4706	0.4737	0.6199	1.0000
pre vs. late	1.0000	0.5765	1.0000	0.6499
early vs. late	0.4706	0.183	0.6199	1.0000

Table B.98. Temporal comparison of prevalence of carious lesions by tooth class in adult females (N-affected/N-total; prevalence rate)

Time Period	Occlusal	Mesial	Distal
Pre-Urbanization	4/4 1.00	2/4 0.50	3/4 0.75
Early Urbanization	2/5 0.40	2/5 0.40	3/5 0.60
Late Urbanization	4/6 0.67	1/6 0.17	3/6 0.50
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)			
pre vs. early	0.1667	1.0000	1.0000
pre vs. late	0.4667	0.5000	0.5714
early vs. late	0.5671	0.5455	1.0000
Time Period	**Buccal**	**Lingual**	**Cervical**
Pre-Urbanization	0/4 0	0/4 0	2/4 0.50
Early Urbanization	2/5 0.40	2/5 0.40	5/5 1.00
Late Urbanization	1/6 0.17	0/6 0	4/6 0.67
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)			
pre vs. early	0.4444	0.4444	0.1667
pre vs. late	1.0000	n/a	1.0000
early vs. late	0.5455	0.1818	0.4545

Table B.99. Temporal comparison of prevalence of carious lesions by tooth surface in adult females (N-individuals with tooth surface affected/N-total individuals with caries; prevalence rate)

Time Period	**Caries**	**Antemortem Tooth Loss**	**Periapical Lesion**	**Calculus**
Pre-Urbanization	5/9 0.56	7/9 0.78	2/9 0.22	7/9 0.78
Early Urbanization	6/7 0.86	5/7 0.71	4/7 0.57	6/7 0.86
Late Urbanization	2/5 0.40	2/5 0.40	1/5 0.20	4/5 0.80
p-value (chi-square)	n/a	n/a	n/a	n/a
p-value (Fisher's exact)				
pre vs. early	0.3077	1.0000	0.3024	1.0000
pre vs. late	1.0000	0.2657	1.0000	1.0000
early vs. late	0.2222	0.5581	0.2929	1.0000

Table B.100. Temporal comparison of prevalence of dental pathological conditions in adult males (N-affected/N-total; prevalence rate)

Time Period	**Incisor**	**Canine**	**Premolar**	**Molar**
Pre-Urbanization	0/8 0	0/8 0	1/9 0.11	5/9 0.56
Early Urbanization	0/8 0	0/8 0	2/8 0.25	6/8 0.75
Late Urbanization	0/5 0	0/5 0	1/5 0.20	2/5 0.40
p-value (chi-square)	n/a	n/a	n/a	n/a
p-value (Fisher's exact)	n/a	n/a		
pre vs. early	-	-	0.5765	0.6199
pre vs. late	-	-	1.0000	1.0000
early vs. late	-	-	1.0000	0.2929

Table B.101. Temporal comparison of prevalence of carious lesions by tooth class in adult males (N-affected/N-total; prevalence rate)

Time Period	Occlusal	Mesial	Distal
Pre-Urbanization	5/5 1.00	1/5 0.20	2/5 0.40
Early Urbanization	6/6 1.00	3/6 0.50	3/6 0.50
Late Urbanization	1/2 0.50	1/2 0.50	1/2 0.50
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)			
pre vs. early	n/a	0.5455	1.0000
pre vs. late	0.2857	1.0000	1.0000
early vs. late	0.2500	1.0000	1.0000
Time Period	**Buccal**	**Lingual**	**Cervical**
Pre-Urbanization	0/5 0	0/5 0	2/5 0.40
Early Urbanization	1/6 0.17	0/6 0	3/6 0.50
Late Urbanization	0/2 0	0/2 0	1/2 0.50
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)			
pre vs. early	1.0000	n/a	1.0000
pre vs. late	n/a	n/a	1.0000
early vs. late	1.0000	n/a	1.0000

Table B.102. Temporal comparison of prevalence of carious lesions by tooth surface in adult males (N-individuals with tooth surface affected/N-total individuals with caries; prevalence rate)

Time Period	**Caries**	**Antemortem Tooth Loss**	**Periapical Lesion**	**Calculus**
Pre-Urbanization	1/8 0.13	0/8 0	0/8 0	1/8 0.13
Early Urbanization	1/10 0.10	0/9 0	0/9 0	6/10 0.60
Late Urbanization	1/6 0.17	0/6 0	0/6 0	4/6 0.67
p-value (chi-square)	n/a	n/a	n/a	n/a
p-value (Fisher's exact)		n/a	n/a	
pre vs. early	1.0000	-	-	0.0656
pre vs. late	1.0000	-	-	0.0909
early vs. late	1.0000	-	-	1.0000

Table B.103. Temporal comparison of prevalence of dental pathological conditions in subadults (N-affected/N-total; prevalence rate)

Time Period	Incisor	Canine	Premolar	Molar
Pre-Urbanization	0/6 0	0/2 0	0/1 0	1/8 0.13
Early Urbanization	0/8 0	0/7 0	0/6 0	1/12 0.08
Late Urbanization	0/6 0	0/4 0	1/2 0.50	0/6 0
p-value (chi-square)	n/a	n/a	n/a	n/a
p-value (Fisher's exact)	n/a	n/a		
pre vs. early	-	-	n/a	1.0000
pre vs. late	-	-	1.0000	1.0000
early vs. late	-	-	0.2500	1.0000

Table B.104. Temporal comparison of prevalence of carious lesions by tooth class in subadults (N-affected/N-total; prevalence rate)

Time Period	Occlusal	Mesial	Distal
Pre-Urbanization	1/1 1.00	0/1 0	0/1 0
Early Urbanization	0/1 0	0/1 0	0/1 0
Late Urbanization	1/1 1.00	0/1 0	1/1 1.00
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)			
pre vs. early	1.0000	n/a	n/a
pre vs. late	n/a	n/a	1.0000
early vs. late	1.0000	n/a	1.0000
Time Period	**Buccal**	**Lingual**	**Cervical**
Pre-Urbanization	0/1 0	0/1 0	0/1 0
Early Urbanization	1/1 1.00	0/1 0	0/1 0
Late Urbanization	0/1 0	0/1 0	0/1 0
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)			
pre vs. early	1.0000	n/a	n/a
pre vs. late	n/a	n/a	n/a
early vs. late	1.0000	n/a	n/a

Table B.105. Temporal comparison of prevalence of carious lesions by tooth surface in subadults (N-individuals with tooth surface affected/N-total individuals with caries; prevalence rate)

Time Period	Caries	Antemortem Tooth Loss	Periapical Lesion	Calculus
Pre-Urbanization				
Females	3/8 0.38	3/9 0.33	5/9 0.56	8/9 0.89
Males	5/9 0.56	7/9 0.78	2/9 0.22	7/9 0.78
p-value (Fisher's exact)	0.6372	0.1534	0.3348	1.0000
Early Urbanization				
Females	5/12 0.42	9/12 0.75	2/12 0.17	6/12 0.50
Males	6/8 0.75	5/8 0.63	4/8 0.50	7/8 0.88
p-value (Fisher's exact)	0.1968	0.6424	0.1611	0.1577
Late Urbanization				
Females	6/11 0.55	6/12 0.50	3/12 0.25	9/11 0.82
Males	2/5 0.40	2/5 0.40	1/5 0.20	4/5 0.80
p-value (Fisher's exact)	1.0000	1.0000	1.0000	1.0000

Table B.106. Temporal comparison of sex differences in prevalence of dental pathological conditions (N-affected/N-total; prevalence rate)

Time Period	Incisor	Canine	Premolar	Molar
Pre-Urbanization				
Females	1/8 0.13	1/9 0.11	2/9 0.22	3/9 0.33
Males	0/8 0	0/8 0	1/9 0.11	5/9 0.56
p-value (Fisher's exact)	1.0000	1.0000	1.0000	0.6372
Early Urbanization				
Females	0/9 0	0/10 0	3/8 0.38	4/9 0.44
Males	0/8 0	0/8 0	2/8 0.25	6/8 0.75
p-value (Fisher's exact)	n/a	n/a	1.0000	0.3348
Late Urbanization				
Females	1/8 0.13	2/8 0.25	2/9 0.22	5/10 0.50
Males	0/5 0	0/5 0	1/5 0.20	2/5 0.40
p-value (Fisher's exact)	1.0000	0.4872	1.0000	1.0000

Table B.107. Temporal comparison of sex differences in prevalence of carious lesions by tooth class (N-affected/N-total; prevalence rate)

Time Period	Occlusal	Mesial	Distal
Pre-Urbanization			
Females	0/4 0	2/4 0.50	3/4 0.75
Males	0/5 0	1/5 0.20	2/5 0.40
p-value (Fisher's exact)	n/a	0.5238	0.5238
Early Urbanization			
Females	2/5 0.40	2/5 0.40	3/5 0.60
Males	6/6 1.00	3/6 0.50	3/6 0.50
p-value (Fisher's exact)	0.0606	1.0000	1.0000
Late Urbanization			
Females	4/6 0.67	1/6 0.17	3/6 0.50
Males	1/2 0.50	1/2 0.50	1/2 0.50
p-value (Fisher's exact)	1.0000	0.4643	1.0000
Time Period	**Buccal**	**Lingual**	**Cervical**
Pre-Urbanization			
Females	0/4 0	0/4 0	2/4 0.50
Males	0/5 0	0/5 0	2/5 0.40
p-value (Fisher's exact)	n/a	n/a	1.0000

Table B.108. Temporal comparison of sex differences in prevalence of carious lesions by tooth surface (N-individuals with tooth surface affected/N-total individuals with caries; prevalence rate)

Continued

Table B.108 continued			
Early Urbanization			
Females	2/5 0.40	2/5 0.40	5/5 1.00
Males	1/6 0.17	0/6 0	3/6 0.50
p-value (Fisher's exact)	0.5455	0.1818	0.1818
Late Urbanization			
Females	1/6 0.17	0/6 0	4/6 0.67
Males	0/2 0	0/2 0	1/2 0.50
p-value (Fisher's exact)	1.0000	n/a	1.0000

Time Period	Caries	Antemortem Tooth Loss	Periapical Lesion	Calculus
Pre-Urbanization				
Adult	8/21 0.38	12/21 0.57	7/21 0.33	17/22 0.77
Subadult	1/8 0.13	0/8 0	0/8 0	1/8 0.13
p-value (Fisher's exact)	0.3715	0.0089*	0.1421	0.0025*
Early Urbanization				
Adult	11/24 0.46	15/23 0.65	6/23 0.26	14/24 0.58
Subadult	1/10 0.10	0/9 0	0/9 0	6/10 0.60
p-value (Fisher's exact)	0.0607	0.0010*	0.1499	1.0000
Late Urbanization				
Adult	8/18 0.44	9/19 0.47	5/19 0.26	15/18 0.83
Subadult	1/6 0.17	0/6 0	0/6 0	4/6 0.67
p-value (Fisher's exact)	0.3509	0.0571	0.2887	0.5680

Table B.109. Temporal comparison of age differences in prevalence of dental pathological conditions (*significant, p≤0.05) (N-affected/N-total; prevalence rate)

Time Period	Incisor	Canine	Premolar	Molar
Pre-Urbanization				
Adults	1/19 0.05	1/19 0.05	3/20 0.15	8/13 0.38
Subadults	0/6 0	0/2 0	0/1 0	1/8 0.13
p-value (Fisher's exact)	1.0000	1.0000	1.0000	0.3715
Early Urbanization				
Adults	0/18 0	0/19 0	5/18 0.28	10/21 0.48
Subadults	0/8 0	0/7 0	0/6 0	1/12 0.08
p-value (Fisher's exact)	n/a	n/a	0.2801	0.0273*
Late Urbanization				
Adults	1/14 0.07	2/14 0.14	3/16 0.19	7/17 0.41
Subadults	0/6 0	0/4 0	1/2 0.50	0/6 0
p-value (Fisher's exact)	1.0000	1.0000	0.4052	0.1243

Table B.110. Temporal comparison of age differences in prevalence of carious lesions by tooth class (*significant, p≤0.05) (N-affected/N-total; prevalence rate)

Time Period	Occlusal	Mesial	Distal
Pre-Urbanization			
Adults	9/9 1.00	3/9 0.33	5/9 0.56
Subadults	1/1 1.00	0/1 0	0/1 0
p-value (Fisher's exact)	n/a	1.0000	1.0000
Early Urbanization			
Adults	8/11 0.73	5/11 0.45	6/11 0.55
Subadults	0/1 0	0/1 0	0/1 0
p-value (Fisher's exact)	0.3333	1.0000	1.0000
Late Urbanization			
Adults	5/8 0.63	2/8 0.25	4/8 0.50
Subadults	1/1 1.00	0/1 0	1/1 1.00
p-value (Fisher's exact)	1.0000	1.0000	1.0000
Time Period	**Buccal**	**Lingual**	**Cervical**
Pre-Urbanization			
Adults	0/9 0	0/9 0	4/9 0.44
Subadults	0/1 0	0/1 0	0/1 0
p-value (Fisher's exact)	n/a	n/a	1.0000

Table B.111. Temporal comparison of age differences in prevalence of carious lesions by tooth surface (N-individuals with tooth surface affected/N-total individuals with caries; prevalence rate)

Continued

Table B.111 continued			
Early Urbanization			
Adults	3/11 0.27	2/11 0.18	8/11 0.73
Subadults	1/1 1.00	0/1 0	0/1 0
p-value (Fisher's exact)	0.3333	1.0000	0.3333
Late Urbanization			
Adults	1/8 0.13	0/8 0	5/8 0.63
Subadults	0/1 0	0/1 0	0/1 0
p-value (Fisher's exact)	1.0000	n/a	0.4444

Time Period	Caries	Caries	Caries	Caries
	1 Lesion	2 Lesions	3 Lesions	4 Lesions
Pre-Urbanization	3/9 0.33	4/9 0.44	0/9 0	1/9 0.11
Early Urbanization	3/11 0.27	4/11 0.36	1/11 0.09	0/11 0
Late Urbanization	4/8 0.50	0/8 0	2/8 0.25	0/8 0

Time Period	Caries	Caries	Caries
	5 Lesions	6 Lesions	7 Lesions
Pre-Urbanization	1/9 0.11	0/9 0	0/9 0
Early Urbanization	0/11 0	1/11 0.09	2/11 0.18
Late Urbanization	1/8 0.13	1/8 0.13	0/8 0

p-values (Fisher's exact)	2	3	4	5	6	7
1						
pre vs. early	1.0000	1.0000	1.0000	1.0000	1.0000	0.4643
pre vs. late	0.1939	0.5000	1.0000	1.0000	1.0000	n/a
early vs. late	0.1939	1.0000	n/a	1.0000	1.0000	0.4444
2						
pre vs. early	-	1.0000	1.0000	1.0000	1.0000	0.4667
pre vs. late	-	0.0667	n/a	0.3333	0.2000	n/a
early vs. late	-	0.1429	n/a	0.2000	0.3333	n/a

Table B.112. Temporal comparison of number of carious lesions in adults (N-individuals with number of lesions/N-total individuals with caries; prevalence rate)

Continued

Table B.112 continued

p-values (Fisher's exact)	2	3	4	5	6	7
3						
pre vs. early	-	-	1.0000	1.0000	n/a	n/a
pre vs. late	-	-	0.3333	1.0000	n/a	n/a
early vs. late	-	-	n/a	1.0000	1.0000	0.4000
4						
pre vs. early	-	-	-	n/a	1.0000	0.3333
pre vs. late	-	-	-	1.0000	1.0000	n/a
early vs. late	-	-	-	n/a	n/a	n/a
5						
pre vs. early	-	-	-	-	1.0000	0.3333
pre vs. late	-	-	-	-	1.0000	n/a
early vs. late	-	-	-	-	1.0000	0.3333
6						
pre vs. early	-	-	-	-	-	n/a
pre vs. late	-	-	-	-	-	n/a
early vs. late	-	-	-	-	-	1.0000

Time Period	Small	Moderate	Large	Pulp Exposure
Pre-Urbanization	4/9 0.44	6/9 0.67	3/9 0.33	5/9 0.56
Early Urbanization	6/11 0.55	8/11 0.73	3/11 0.28	6/11 0.55
Late Urbanization	5/8 0.63	3/8 0.38	3/8 0.38	4/8 0.50
p-value (chi-square)	n/a	n/a	n/a	n/a
p-value (Fisher's exact)				
pre vs. early	1.0000	1.0000	1.0000	1.0000
pre vs. late	0.6372	0.3469	1.0000	1.0000
early vs. late	1.0000	0.1809	1.0000	1.0000

Table B.113. Temporal comparison of carious lesion size in adults (N-individuals with lesion size/N-total individuals with caries; prevalence rate)

Time Period	Caries 1 Lesion	Caries 2 Lesions	Caries 3 Lesions
Pre-Urbanization	0/4 0	3/4 0.75	0/4 0
Early Urbanization	1/5 0.20	2/5 0.40	1/5 0.20
Late Urbanization	3/6 0.50	0/6 0	2/6 0.33
Time Period	**Caries 4 Lesions**	**Caries 5 Lesions**	**Caries 6 Lesions**
Pre-Urbanization	1/4 0.25	0/4 0	0/4 0
Early Urbanization	0/5 0	0/5 0	1/5 0.20
Late Urbanization	0/6 0	1/6 0.17	0/6 0

p-values (Fisher's exact)	2	3	4	5	6
1					
pre vs. early	1.0000	n/a	1.0000	n/a	n/a
pre vs. late	0.1000	n/a	0.2500	n/a	n/a
early vs. late	0.4000	1.0000	n/a	1.0000	0.4000
2					
pre vs. early	-	1.0000	1.0000	n/a	1.0000
pre vs. late	-	0.1000	n/a	0.2500	n/a
early vs. late	-	0.4000	n/a	0.3333	n/a
3					
pre vs. early	-	-	1.0000	n/a	n/a
pre vs. late	-	-	0.3333	n/a	n/a
early vs. late	-	-	n/a	1.0000	1.0000

Table B.114. Temporal comparison of number of carious lesions in adult females (N-individuals with number of lesions/N-total individuals with caries; prevalence rate)

Continued

Table B.114 continued

p-values (Fisher's exact)	**2**	**3**	**4**	**5**	**6**
4					
pre vs. early	-	-	-	n/a	1.0000
pre vs. late	-	-	-	1.0000	n/a
early vs. late	-	-	-	n/a	n/a
5					
pre vs. early	-	-	-	-	n/a
pre vs. late	-	-	-	-	n/a
early vs. late	-	-	-	-	1.0000

Time Period	Small	Moderate	Large	Pulp Exposure
Pre-Urbanization	1/4 0.25	4/4 1.00	1/4 0.25	3/4 0.75
Early Urbanization	3/5 0.60	5/5 1.00	1/5 0.20	2/5 0.40
Late Urbanization	4/6 0.67	2/6 0.33	1/6 0.17	3/6 0.50
p-value (chi-square)	n/a	n/a	n/a	n/a
p-value (Fisher's exact)				
pre vs. early	0.5238	n/a	1.0000	0.5238
pre vs. late	0.5238	0.0762	1.0000	0.5714
early vs. late	1.0000	0.0606	1.0000	1.0000

Table B.115. Temporal comparison of carious lesion size in adult females (N-individuals with lesion size/N-total individuals with caries; prevalence rate)

Time Period	Caries	Caries	Caries	Caries	Caries
	1 Lesion	**2 Lesions**	**5 Lesions**	**6 Lesions**	**7 Lesions**
Pre-Urbanization	3/5 0.60	1/5 0.20	1/5 0.20	0/5 0	0/5 0
Early Urbanization	2/6 0.33	2/6 0.33	0/6 0	0/6 0	2/6 0.33
Late Urbanization	1/2 0.50	0/2 0	0/2 0	1/2 0.50	0/2 0

p-values (Fisher's exact)	2	5	6	7
1				
pre vs. early	1.0000	1.0000	n/a	0.4286
pre vs. late	1.0000	1.0000	0.4000	n/a
early vs. late	1.0000	n/a	1.0000	1.0000
2				
pre vs. early	-	1.0000	n/a	1.0000
pre vs. late	-	n/a	1.0000	n/a
early vs. late	-	n/a	0.3333	n/a
5				
pre vs. early	-	-	n/a	0.3333
pre vs. late	-	-	1.0000	n/a
early vs. late	-	-	n/a	n/a
6				
pre vs. early	-	-	-	n/a
pre vs. late	-	-	-	n/a
early vs. late	-	-	-	0.3333

Table B.116. Temporal comparison of number of carious lesions in adult males (N-individuals with number of lesions/N-total individuals with caries; prevalence rate)

Time Period	Small	Moderate	Large	Pulp Exposure
Pre-Urbanization	3/5 0.60	2/5 0.40	2/5 0.40	2/5 0.40
Early Urbanization	3/6 0.50	3/6 0.50	2/6 0.33	4/6 0.67
Late Urbanization	1/2 0.50	1/2 0.50	2/2 1.00	1/2 0.50
p-value (chi-square)	n/a	n/a	n/a	n/a
p-value (Fisher's exact)				
pre vs. early	1.0000	1.0000	1.0000	0.5671
pre vs. late	1.0000	1.0000	0.4286	1.0000
early vs. late	1.0000	1.0000	0.4286	1.0000

Table B.117. Temporal comparison of carious lesion size in adult males (N-individuals with lesion size/N-total individuals with caries; prevalence rate)

Time Period	Caries
	1 Lesion
Pre-Urbanization	1/1 1.00
Early Urbanization	1/1 1.00
Late Urbanization	1/1 1.00

Table B.118. Temporal comparison of number of carious lesions in subadults (N-individuals with number of lesions/N-total individuals with caries; prevalence rate)

Time Period	Small	Moderate	Large	Pulp Exposure
Pre-Urbanization	0/1 0	1/1 1.00	0/1 0	0/1 0
Early Urbanization	1/1 1.00	0/1 0	0/1 0	0/1 0
Late Urbanization	0/1 0	0/1 0	1/1 1.00	0/1 0
p-value (chi-square)	n/a	n/a	n/a	n/a
p-value (Fisher's exact)				
pre vs. early	1.0000	1.0000	n/a	n/a
pre vs. late	n/a	1.0000	1.0000	n/a
early vs. late	1.0000	n/a	1.0000	n/a

Table B.119. Temporal comparison of carious lesion size in subadults
(N-individuals with lesion size/N-total individuals with caries; prevalence rate)

Time Period	Caries 1 Lesion	Caries 2 Lesions	Caries 3 Lesions	Caries 4 Lesions
Pre-Urbanization				
Females	0/4 0	3/4 0.75	n/a	1/4 0.25
Males	3/5 0.60	1/5 0.20	n/a	0/5 0
Early Urbanization				
Females	1/5 0.20	2/5 0.40	1/5 0.20	n/a
Males	2/6 0.33	2/6 0.33	0/6 0	n/a
Late Urbanization				
Females	3/6 0.50	n/a	2/6 0.33	n/a
Males	1/2 0.50	n/a	0/2 0	n/a

Time Period	Caries 5 Lesions	Caries 6 Lesions	Caries 7 Lesions
Pre-Urbanization			
Females	0/1 0	n/a	n/a
Males	1/5 0.20	n/a	n/a

Table B.120. Temporal comparison of sex differences in number of carious lesions (N-individuals with number of lesions/N-total individuals with caries; prevalence rate)

Continued

Table B.120 continued			
Early Urbanization			
Females	n/a	1/5 0.20	0/5 0
Males	n/a	0/6 0	2/6 0.33
Late Urbanization			
Females	1/6 0.17	0/6 0	n/a
Males	0/2 0	1/2 0.50	n/a

Time Period	**Small**	**Moderate**	**Large**	**Pulp Exposure**
Pre-Urbanization				
Females	1/4 0.25	4/4 1.00	1/4 0.25	3/4 0.75
Males	3/5 0.60	2/5 0.40	2/5 0.40	2/5 0.40
p-value (Fisher's exact)	0.5238	0.1667	1.0000	0.5238
Early Urbanization				
Females	3/5 0.60	5/5 1.00	1/5 0.20	2/5 0.40
Males	3/6 0.50	3/6 0.50	2/6 0.33	4/6 0.67
p-value (Fisher's exact)	1.0000	0.1818	1.0000	0.5671
Late Urbanization				
Females	4/6 0.67	2/6 0.33	1/6 0.17	3/6 0.50
Males	1/2 0.50	1/2 0.50	2/2 1.00	1/2 0.50
p-value (Fisher's exact)	1.0000	1.0000	0.1071	1.0000

Table B.121. Temporal comparison of sex differences in carious lesion size (N-individuals with lesion size/N-total individuals with caries; prevalence rate)

Time Period	Caries 1 Lesion	Caries 2 Lesions	Caries 3 Lesions	Caries 4 Lesions
Pre-Urbanization				
Adults	3/9 0.33	4/9 0.44	n/a	1/9 0.11
Subadults	1/1 1.00	0/1 0	n/a	0/1 0
Early Urbanization				
Adults	3/11 0.27	4/11 0.36	1/11 0.09	n/a
Subadults	1/1 1.00	0/1 0	0/1 0	n/a
Late Urbanization				
Adults	4/8 0.50	n/a	2/8 0.25	n/a
Subadults	1/1 1.00	n/a	0/1 0	n/a

Time Period	Caries 5 Lesions	Caries 6 Lesions	Caries 7 Lesions
Pre-Urbanization			
Adults	1/9 0.11	n/a	n/a
Subadults	0/1 0	n/a	n/a

Table B.122. Temporal comparison of age differences in number of carious lesions (N-individuals with number of lesions/N-total individuals with caries; prevalence rate)

Continued

Table B.122 continued			
Early Urbanization			
Adults	n/a	1/11 0.09	2/11 0.18
Subadults	n/a	0/1 0	0/1 0
Late Urbanization			
Adults	1/8 0.13	1/8 0.13	n/a
Subadults	0/1 0	0/1 0	n/a

Time Period	**Small**	**Moderate**	**Large**	**Pulp Exposure**
Pre-Urbanization				
Adults	4/9 0.44	6/9 0.67	3/9 0.33	5/9 0.56
Subadults	0/1 0	1/1 1.00	0/1 0	0/1 0
p-value (Fisher's exact)	1.0000	1.0000	1.0000	1.0000
Early Urbanization				
Adults	6/11 0.55	8/11 0.73	3/11 0.27	6/11 0.55
Subadults	1/1 1.00	0/1 0	0/1 0	0/1 0
p-value (Fisher's exact)	1.0000	0.3333	1.0000	1.0000
Late Urbanization				
Adults	5/8 0.63	3/8 0.38	3/8 0.38	4/8 0.50
Subadults	0/1 0	0/1 0	1/1 1.00	0/1 0
p-value (Fisher's exact)	0.4444	1.0000	0.4444	1.0000

Table B.123. Temporal comparison of age differences in carious lesion size (N-individuals with lesion size/N-total individuals with caries; prevalence rate)

Time Period	ATL 1 Tooth	ATL 2 Teeth	ATL 3 Teeth	ATL 4 Teeth
Pre-Urbanization	4/12 0.33	5/12 0.42	1/12 0.08	0/12 0
Early Urbanization	2/15 0.13	2/15 0.13	2/15 0.13	3/15 0.20
Late Urbanization	3/9 0.33	0/9 0	1/9 0.11	1/9 0.11
Time Period	**ATL 5 Teeth**	**ATL 6 Teeth**	**ATL 7 Teeth**	**ATL 9 Teeth**
Pre-Urbanization	0/12 0	0/12 0	0/12 0	0/12 0
Early Urbanization	2/15 0.13	2/15 0.13	1/15 0.07	1/15 0.07
Late Urbanization	2/9 0.22	0/9 0	0/9 0	0/9 0
Time Period	**ATL 11 Teeth**	**ATL 12 Teeth**	**ATL 13 Teeth**	**ATL 32 Teeth**
Pre-Urbanization	1/12 0.08	1/12 0.08	0/12 0	0/12 0
Early Urbanization	0/15 0	0/15 0	0/15 0	0/15 0
Late Urbanization	0/9 0	0/9 0	1/9 0.11	1/9 0.11

Table B.124. Temporal comparison of number of teeth lost antemortem in adults (*significant, p≤0.05) (N-individuals with number of teeth lost/N-total individuals with tooth loss; prevalence rate)

Continued

Table B.124 continued						
p-values (Fisher's exact)	**2**	**3**	**4**	**5**	**6**	**7**
1						
pre vs. early	1.0000	0.5238	0.1667	0.4286	0.4286	0.4286
pre vs. late	0.2045	1.0000	1.0000	0.4444	n/a	n/a
early vs. late	0.4286	1.0000	0.5238	1.0000	0.4286	1.0000
2						
pre vs. early	-	0.5000	0.1667	0.1667	0.1667	0.3750
pre vs. late	-	0.2857	0.1667	0.0476*	n/a	n/a
early vs. late	-	1.0000	1.0000	0.4667	n/a	n/a
3						
pre vs. early	-	-	1.0000	1.0000	1.0000	1.0000
pre vs. late	-	-	1.0000	1.0000	n/a	n/a
early vs. late	-	-	1.0000	1.0000	1.0000	1.0000
4						
pre vs. early	-	-	-	n/a	n/a	n/a
pre vs. late	-	-	-	n/a	n/a	n/a
early vs. late	-	-	-	1.0000	1.0000	1.0000
5						
pre vs. early	-	-	-	-	n/a	n/a
pre vs. late	-	-	-	-	n/a	n/a
early vs. late	-	-	-	-	0.4667	1.0000
6						
pre vs. early	-	-	-	-	-	n/a
pre vs. late	-	-	-	-	-	n/a
early vs. late	-	-	-	-	-	n/a

Continued

Table B.124 continued					
p-values (Fisher's exact)	**9**	**11**	**12**	**13**	**32**
1					
pre vs. early	0.4286	1.0000	1.0000	n/a	n/a
pre vs. late	n/a	1.0000	1.0000	1.0000	1.0000
early vs. late	1.0000	n/a	n/a	1.0000	1.0000
2					
pre vs. early	0.3750	1.0000	1.0000	n/a	n/a
pre vs. late	n/a	n/a	n/a	0.1667	0.1667
early vs. late	n/a	n/a	n/a	0.3333	0.3333
3					
pre vs. early	1.0000	1.0000	1.0000	n/a	n/a
pre vs. late	n/a	1.0000	1.0000	1.0000	1.0000
early vs. late	1.0000	n/a	n/a	1.0000	1.0000
4					
pre vs. early	n/a	0.2500	0.2500	n/a	n/a
pre vs. late	n/a	1.0000	1.0000	n/a	n/a
early vs. late	1.0000	n/a	n/a	0.4000	0.4000
5					
pre vs. early	n/a	0.3333	0.3333	n/a	n/a
pre vs. late	n/a	0.3333	0.3333	n/a	n/a
early vs. late	1.0000	n/a	n/a	1.0000	n/a
6					
pre vs. early	n/a	0.3333	0.3333	n/a	n/a
pre vs. late	n/a	n/a	n/a	n/a	n/a
early vs. late	n/a	n/a	n/a	0.3333	0.3333
7					
pre vs. early	n/a	1.0000	1.0000	n/a	n/a
pre vs. late	n/a	n/a	n/a	n/a	n/a
early vs. late	n/a	n/a	n/a	1.0000	1.0000

Continued

Table B.124 continued					
p-values (Fisher's exact)	**9**	**11**	**12**	**13**	**32**
9					
pre vs. early	-	1.0000	1.0000	n/a	n/a
pre vs. late	-	n/a	n/a	n/a	n/a
early vs. late	-	n/a	n/a	1.0000	1.0000
11					
pre vs. early	-	-	n/a	n/a	n/a
pre vs. late	-	-	n/a	1.0000	1.0000
early vs. late	-	-	n/a	n/a	n/a
12					
pre vs. early	-	-	-	n/a	n/a
pre vs. late	-	-	-	1.0000	1.0000
early vs. late	-	-	-	n/a	n/a
13					
pre vs. early	-	-	-	-	n/a
pre vs. late	-	-	-	-	n/a
early vs. late	-	-	-	-	n/a

Time Period	ATL 1 Tooth	ATL 2 Teeth	ATL 4 Teeth	ATL 5 Teeth
Pre-Urbanization	1/3 0.33	0/3 0	0/3 0	0/3 0
Early Urbanization	1/9 0.11	2/9 0.22	2/9 0.22	1/9 0.11
Late Urbanization	1/6 0.17	0/6 0	1/6 0.17	2/6 0.33
Time Period	**ATL 6 Teeth**	**ATL 7 Teeth**	**ATL 9 Teeth**	**ATL 11 Teeth**
Pre-Urbanization	0/3 0	0/3 0	0/3 0	1/3 0.33
Early Urbanization	1/9 0.11	1/9 0.11	1/9 0.11	0/9 0
Late Urbanization	0/6 0	0/6 0	0/6 0	0/6 0
Time Period	**ATL 12 Teeth**	**ATL 13 Teeth**	**ATL 32 Teeth**	
Pre-Urbanization	1/3 0.33	0/3 0	0/3 0	
Early Urbanization	0/9 0	0/9 0	0/9 0	
Late Urbanization	0/6 0	1/6 0.17	1/6 0.17	

Table B.125. Temporal comparison of number of teeth lost antemortem in adult females (N-individuals with number of teeth lost/N-total individuals with tooth loss; prevalence rate)

Continued

Table B.125 continued					
p-values (Fisher's exact)	**2**	**4**	**5**	**6**	**7**
1					
pre vs. early	1.0000	1.0000	1.0000	1.0000	1.0000
pre vs. late	n/a	1.0000	1.0000	n/a	n/a
early vs. late	1.0000	1.0000	1.0000	1.0000	1.0000
2					
pre vs. early	-	n/a	n/a	n/a	n/a
pre vs. late	-	n/a	n/a	n/a	n/a
early vs. late	-	1.0000	0.4000	n/a	n/a
4					
pre vs. early	-	-	n/a	n/a	n/a
pre vs. late	-	-	n/a	n/a	n/a
early vs. late	-	-	1.0000	1.0000	1.0000
5					
pre vs. early	-	-	-	n/a	n/a
pre vs. late	-	-	-	n/a	n/a
early vs. late	-	-	-	1.0000	1.0000
6					
pre vs. early	-	-	-	-	n/a
pre vs. late	-	-	-	-	n/a
early vs. late	-	-	-	-	n/a
p-values (Fisher's exact)	**9**	**11**	**12**	**13**	**32**
1					
pre vs. early	1.0000	1.0000	1.0000	n/a	n/a
pre vs. late	n/a	1.0000	1.0000	1.0000	1.0000
early vs. late	1.0000	n/a	n/a	1.0000	1.0000
2					
pre vs. early	n/a	0.3333	0.3333	n/a	n/a
pre vs. late	n/a	n/a	n/a	n/a	n/a
early vs. late	n/a	n/a	n/a	0.3333	0.3333

Continued

Table B.125 continued					
p-values (Fisher's exact)	**9**	**11**	**12**	**13**	**32**
4					
pre vs. early	n/a	0.3333	0.3333	n/a	n/a
pre vs. late	n/a	1.0000	1.0000	n/a	n/a
early vs. late	1.0000	n/a	n/a	1.0000	1.0000
5					
pre vs. early	n/a	1.0000	1.0000	n/a	n/a
pre vs. late	n/a	0.3333	0.3333	n/a	n/a
early vs. late	1.0000	n/a	n/a	1.0000	1.0000
6					
pre vs. early	n/a	1.0000	1.0000	n/a	n/a
pre vs. late	n/a	n/a	n/a	n/a	n/a
early vs. late	n/a	n/a	n/a	1.0000	1.0000
7					
pre vs. early	n/a	1.0000	1.0000	n/a	n/a
pre vs. late	n/a	n/a	n/a	n/a	n/a
early vs. late	n/a	n/a	n/a	1.0000	1.0000
9					
pre vs. early	-	1.0000	1.0000	n/a	n/a
pre vs. late	-	n/a	n/a	n/a	n/a
early vs. late	-	n/a	n/a	1.0000	1.0000
11					
pre vs. early	-	-	n/a	n/a	n/a
pre vs. late	-	-	n/a	1.0000	1.0000
early vs. late	-	-	n/a	n/a	n/a
12					
pre vs. early	-	-	-	n/a	n/a
pre vs. late	-	-	-	1.0000	1.0000
early vs. late	-	-	-	n/a	n/a

Continued

Table B.125 continued					
p-values (Fisher's exact)	**9**	**11**	**12**	**13**	**32**
13					
pre vs. early	-	-	-	-	n/a
pre vs. late	-	-	-	-	n/a
early vs. late	-	-	-	-	n/a

Time Period	ATL 1 Tooth	ATL 2 Teeth	ATL 3 Teeth
Pre-Urbanization	3/7 0.43	4/7 0.57	0/7 0
Early Urbanization	0/5 0	0/5 0	2/5 0.40
Late Urbanization	2/2 1.00	0/2 0	0/2 0
Time Period	**ATL 4 Teeth**	**ATL 5 Teeth**	**ATL 6 Teeth**
Pre-Urbanization	0/7 0	0/7 0	0/7 0
Early Urbanization	1/5 0.20	1/5 0.20	1/5 0.20
Late Urbanization	0/2 0	0/2 0	0/2 0

p-values (Fisher's exact)	2	3	4	5	6
1					
pre vs. early	n/a	0.1000	0.2500	0.2500	0.2500
pre vs. late	0.4444	n/a	n/a	n/a	n/a
early vs. late	n/a	0.3333	0.3333	0.3333	0.3333
2					
pre vs. early	-	0.0667	0.2000	0.2000	0.2000
pre vs. late	-	n/a	n/a	n/a	n/a
early vs. late	-	n/a	n/a	n/a	n/a
3					
pre vs. early	-	-	n/a	n/a	n/a
pre vs. late	-	-	n/a	n/a	n/a
early vs. late	-	-	n/a	n/a	n/a

Table B.126. Temporal comparison of number of teeth lost antemortem in adult males (N-individuals with number of teeth lost/N-total individuals with tooth loss; prevalence rate)

Continued

Table B.126 continued					
p-values (Fisher's exact)	**2**	**3**	**4**	**5**	**6**
4					
pre vs. early	-	-	-	n/a	n/a
pre vs. late	-	-	-	n/a	n/a
early vs. late	-	-	-	n/a	n/a
5					
pre vs. early	-	-	-	-	n/a
pre vs. late	-	-	-	-	n/a
early vs. late	-	-	-	-	n/a

Time Period	ATL	ATL	ATL	ATL
	1 Tooth	**2 Teeth**	**3 Teeth**	**4 Teeth**
Pre-Urbanization				
Females	1/3 0.33	0/3 0	n/a	n/a
Males	3/7 0.43	4/7 0.57	n/a	n/a
Early Urbanization				
Females	1/9 0.11	2/9 0.22	0/9 0	2/9 0.22
Males	0/5 0	0/5 0	2/5 0.40	1/5 0.20
Late Urbanization				
Females	1/6 0.17	n/a	n/a	1/6 0.17
Males	2/2 1.00	n/a	n/a	0/2 0
Time Period	**ATL**	**ATL**	**ATL**	**ATL**
	5 Teeth	**6 Teeth**	**7 Teeth**	**9 Teeth**
Pre-Urbanization				
Females	n/a	n/a	n/a	n/a
Males	n/a	n/a	n/a	n/a

Table B.127. Temporal comparison of sex differences in number of teeth lost antemortem (N-individuals with number of teeth lost/N-total individuals with tooth loss; prevalence rate)

Continued

Table B.127 continued				
Early Urbanization				
Females	1/9 0.11	1/9 0.11	1/9 0.11	1/9 0.11
Males	1/5 0.20	1/5 0.20	0/5 0	0/5 0
Late Urbanization				
Females	2/6 0.33	n/a	n/a	n/a
Males	0/2 0	n/a	n/a	n/a
Time Period	**ATL**	**ATL**	**ATL**	**ATL**
	11 Teeth	**12 Teeth**	**13 Teeth**	**32 Teeth**
Pre-Urbanization				
Females	1/3 0.33	1/3 0.33	n/a	n/a
Males	0/7 0	0/7 0	n/a	n/a
Early Urbanization				
Females	n/a	n/a	n/a	n/a
Males	n/a	n/a	n/a	n/a
Late Urbanization				
Females	n/a	n/a	1/6 0.17	1/6 0.17
Males	n/a	n/a	0/2 0	0/2 0

Continued

Table B.127 continued

p-values (Fisher's exact) Pre-Urbanization	2	11	12
1	1.0000	0.4000	0.4000
2	-	0.2000	0.2000
11	-	-	n/a

p-values (Fisher's exact) Early Urbanization	2	3	4	5	6	7	9
1	n/a	0.3333	1.0000	1.0000	1.0000	n/a	n/a
2	-	0.3333	1.0000	1.0000	1.0000	n/a	n/a
3	-	-	0.4000	1.0000	1.0000	0.3333	0.3333
4	-	-	-	1.0000	1.0000	1.0000	1.0000
5	-	-	-	-	1.0000	1.0000	1.0000
6	-	-	-	-	-	1.0000	1.0000
7	-	-	-	-	-	-	1.0000

p-values (Fisher's exact) Late Urbanization	4	5	13	32
1	1.0000	0.4000	1.0000	1.0000
4	-	n/a	n/a	n/a
5	-	-	n/a	n/a
13	-	-	-	n/a

Time Period	ATL 1 Tooth	ATL 2 Teeth	ATL 3 Teeth	ATL 4 Teeth
Pre-Urbanization				
Adults	4/12 0.33	1/12 0.08	1/12 0.08	n/a
Subadults	n/a	n/a	n/a	n/a
Early Urbanization				
Adults	2/15 0.13	2/15 0.13	2/15 0.13	3/15 0.20
Subadults	n/a	n/a	n/a	n/a
Late Urbanization				
Adults	3/9 0.33	n/a	1/9 0.11	1/9 0.11
Subadults	n/a	n/a	n/a	n/a
Time Period	**ATL 5 Teeth**	**ATL 6 Teeth**	**ATL 7 Teeth**	**ATL 9 Teeth**
Pre-Urbanization				
Adults	n/a	n/a	n/a	n/a
Subadults	n/a	n/a	n/a	n/a

Table B.128. Temporal comparison of age differences in number of teeth lost antemortem (N-individuals with number of teeth lost/N-total individuals with tooth loss; prevalence rate)

Continued

Table B.128 continued				
Early Urbanization				
Adults	2/15 0.13	2/15 0.13	1/15 0.07	1/15 0.07
Subadults	n/a	n/a	n/a	n/a
Late Urbanization				
Adults	2/9 0.22	n/a	n/a	n/a
Subadults	n/a	n/a	n/a	n/a
Time Period	**ATL**	**ATL**	**ATL**	**ATL**
	11 Teeth	**12 Teeth**	**13 Teeth**	**32 Teeth**
Pre-Urbanization				
Adults	5/12 0.42	1/12 0.08	n/a	n/a
Subadults	n/a	n/a	n/a	n/a
Early Urbanization				
Adults	n/a	0/7 0	n/a	n/a
Subadults	n/a	n/a	n/a	n/a
Late Urbanization				
Adults	n/a	n/a	1/9 0.11	1/9 0.11
Subadults	n/a	n/a	n/a	n/a

Time Period	**Periapical Lesion**	**Periapical Lesion**	**Periapical Lesion**
	1 Lesion	**2 Lesions**	**3 Lesions**
Pre-Urbanization	6/7 0.86	1/7 0.14	0/7 0
Early Urbanization	2/6 0.33	3/6 0.50	1/6 0.17
Late Urbanization	4/5 0.80	0/5 0	1/5 0.20

p-values (Fisher's exact)	**2**	**3**
1		
pre vs. early	0.2222	0.3333
pre vs. late	1.0000	0.4545
early vs. late	0.1667	1.0000
2		
pre vs. early	-	1.0000
pre vs. late	-	1.0000
early vs. late	-	0.4000

Table B.129. Temporal comparison of number of periapical lesions in adults (N-individuals with number of lesions/N-total individuals with periapical lesions; prevalence rate)

Time Period	Periapical Lesion	Periapical Lesion	Periapical Lesion
	1 Lesion	2 Lesions	3 Lesions
Pre-Urbanization	5/5 1.00	0/5 0	0/5 0
Early Urbanization	1/2 0.50	1/2 0.50	0/2 0
Late Urbanization	2/3 0.67	0/3 0	1/3 0.33

p-values (Fisher's exact)	2	3
1		
pre vs. early	0.2857	n/a
pre vs. late	n/a	0.3750
early vs. late	1.0000	1.0000
2		
pre vs. early	-	n/a
pre vs. late	-	n/a
early vs. late	-	1.0000

Table B.130. Temporal comparison of number of periapical lesions in adult females (N-individuals with number of lesions/N-total individuals with periapical lesions; prevalence rate)

Time Period	Periapical Lesion	Periapical Lesion	Periapical Lesion
	1 Lesion	**2 Lesions**	**3 Lesions**
Pre-Urbanization	1/2 0.50	1/2 0.50	0/2 0
Early Urbanization	1/4 0.25	2/4 0.50	1/4 0.25
Late Urbanization	1/1 1.00	0/1 0	0/1 0

p-values (Fisher's exact)	2	3
1		
pre vs. early	1.0000	1.0000
pre vs. late	1.0000	n/a
early vs. late	1.0000	1.0000
2		
pre vs. early	-	1.0000
pre vs. late	-	n/a
early vs. late	-	n/a

Table B.131. Temporal comparison of number of periapical lesions in adult males (N-individuals with number of lesions/N-total individuals with periapical lesions; prevalence rate)

Time Period	Periapical Lesion	Periapical Lesion	Periapical Lesion
	1 Lesion	2 Lesions	3 Lesions
Pre-Urbanization			
Females	5/5 1.00	0/5 0	n/a
Males	1/2 0.50	1/2 0.50	n/a
Early Urbanization			
Females	1/2 0.50	1/2 0.50	0/2 0
Males	1/4 0.25	2/4 0.50	1/4 0.25
Late Urbanization			
Females	2/3 0.67	n/a	1/3 0.33
Males	1/1 1.00	n/a	0/1 0

p-values (Fisher's Exact) Pre-Urbanization	2	
1	0.2857	
p-values (Fisher's Exact) Early Urbanization	**2**	**3**
1	1.0000	1.0000
2	-	1.0000
p-values (Fisher's Exact) Late Urbanization	**2**	
1	1.0000	

Table B.132. Temporal comparison of sex differences in number of periapical lesions (N-individuals with number of lesions/N-total individuals with periapical lesions; prevalence rate)

Time Period	**Periapical Lesion**	**Periapical Lesion**	**Periapical Lesion**
	1 Lesion	**2 Lesions**	**3 Lesions**
Pre-Urbanization			
Adults	6/7 0.85	1/7 0.14	n/a
Subadults	n/a	n/a	n/a
Early Urbanization			
Adults	2/6 0.33	3/6 0.50	1/6 0.17
Subadults	n/a	n/a	n/a
Late Urbanization			
Adults	4/5 0.80	n/a	1/5 0.20
Subadults	n/a	n/a	n/a

Table B.133. Temporal comparison of age differences in number of periapical lesions (N-individuals with number of lesions/N-total individuals with periapical lesions; prevalence rate)

Time Period	Calculus	Calculus	Calculus	Calculus
	Prevalence of Score of 2	Prevalence of Score of 3	Prevalence of Score of 4	Prevalence of Score of 5
Pre-Urbanization	4/17 0.24	9/17 0.53	1/17 0.06	3/17 0.18
Early Urbanization	1/14 0.07	7/14 0.50	3/14 0.21	3/14 0.22
Late Urbanization	6/15 0.40	4/15 0.27	3/15 0.20	2/15 0.13

p-values (Fisher's exact)	3	4	5
2			
pre vs. early	0.6065	0.2063	0.5455
pre vs. late	0.2215	1.0000	0.6084
early vs. late	0.0656	0.2657	0.2222
3			
pre vs. early	-	0.5820	1.0000
pre vs. late	-	0.2500	1.0000
early vs. late	-	0.6437	1.0000
4			
pre vs. early	-	-	0.5714
pre vs. late	-	-	0.5238
early vs. late	-	-	1.0000

Table B.134. Temporal comparison severity of dental calculus in adults (N-individuals with level of severity/N-total individuals with calculus; prevalence rate)

Time Period	Calculus	Calculus	Calculus	Calculus
	Prevalence of Score of 2	Prevalence of Score of 3	Prevalence of Score of 4	Prevalence of Score of 5
Pre-Urbanization	3/8 0.38	3/8 0.38	1/8 0.13	1/8 0.13
Early Urbanization	0/6 0	4/6 0.67	0/6 0	2/6 0.33
Late Urbanization	4/9 0.44	3/9 0.33	2/9 0.22	0/9 0

p-values (Fisher's exact)	3	4	5
2			
pre vs. early	0.2000	n/a	0.4000
pre vs. late	1.0000	1.0000	1.0000
early vs. late	0.1939	n/a	0.0667
3			
pre vs. early	-	1.0000	1.0000
pre vs. late	-	1.0000	1.0000
early vs. late	-	0.4444	0.5000
4			
pre vs. early	-	-	1.0000
pre vs. late	-	-	1.0000
early vs. late	-	-	0.3333

Table B.135. Temporal comparison severity of dental calculus in adult females (N-individuals with level of severity/N-total individuals with calculus; prevalence rate)

Time Period	Calculus	Calculus	Calculus	Calculus
	Prevalence of Score of 2	**Prevalence of Score of 3**	**Prevalence of Score of 4**	**Prevalence of Score of 5**
Pre-Urbanization	1/7 0.14	4/7 0.57	0/7 0	2/7 0.29
Early Urbanization	1/6 0.17	1/6 0.17	3/6 0.50	1/6 0.17
Late Urbanization	0/4 0	1/4 0.25	1/4 0.25	2/4 0.50

p-values (Fisher's exact)	3	4	5
2			
pre vs. early	1.0000	0.4000	1.0000
pre vs. late	1.0000	1.0000	1.0000
early vs. late	1.0000	1.0000	1.0000
3			
pre vs. early	-	0.1429	1.0000
pre vs. late	-	0.3333	0.5238
early vs. late	-	1.0000	1.0000
4			
pre vs. early	-	-	0.4000
pre vs. late	-	-	1.0000
early vs. late	-	-	0.4857

Table B.136. Temporal comparison severity of dental calculus in adult males
(N-individuals with level of severity/N-total individuals with calculus; prevalence rate)

Time Period	Calculus	Calculus
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization	1/1 1.00	0/1 0
Early Urbanization	3/6 0.50	3/6 0.50
Late Urbanization	1/4 0.25	3/4 0.75

p-values (Fisher's exact)	3
2	
pre vs. early	1.0000
pre vs. late	0.4000
early vs. late	0.5714

Table B.137. Temporal comparison severity of dental calculus in subadults
(N-individuals with level of severity/N-total individuals with calculus; prevalence rate)

Time Period	Calculus	Calculus	Calculus	Calculus
	Prevalence of Score of 2	**Prevalence of Score of 3**	**Prevalence of Score of 4**	**Prevalence of Score of 5**
Pre-Urbanization				
Females	3/8 0.38	3/8 0.38	1/8 0.13	1/8 0.13
Males	1/7 0.14	4/7 0.57	0/7 0	2/7 0.29
Early Urbanization				
Females	0/6 0	4/6 0.67	0/6 0	2/6 0.33
Males	1/6 0.17	1/6 0.17	3/6 0.50	1/6 0.17
Late Urbanization				
Females	4/9 0.44	3/9 0.33	2/9 0.22	0/9 0
Males	0/4 0	1/4 0.25	1/4 0.25	2/4 0.50

p-values (Fisher's exact) Pre-Urbanization	3	4	5
2	0.5455	1.0000	0.4857
3	-	1.0000	1.0000
4	-	-	1.0000
p-values (Fisher's exact) Early Urbanization	**3**	**4**	**5**
2	0.3333	n/a	1.0000
3	-	0.1429	1.0000
4	-	-	0.4000
p-values (Fisher's exact) Late Urbanization	**3**	**4**	**5**
2	1.0000	0.4286	0.0667
3	-	1.0000	0.4000
4	-	-	0.4000

Table B.138. Temporal comparison sex differences in severity of dental calculus (N-individuals with level of severity/N-total individuals with calculus; prevalence rate)

Time Period	Calculus	Calculus	Calculus	Calculus
	Prevalence of Score 2	**Prevalence of Score 3**	**Prevalence of Score 4**	**Prevalence of Score 5**
Pre-Urbanization				
Adults	4/17 0.24	9/17 0.53	1/17 0.06	3/17 0.18
Subadults	1/1 1.00	0/1 0	0/1 0	0/1 0
Early Urbanization				
Adults	1/14 0.07	7/14 0.50	3/14 0.21	3/14 0.21
Subadults	3/6 0.50	3/6 0.50	0/6 0	0/6 0
Late Urbanization				
Adults	6/15 0.40	4/15 0.27	3/15 0.20	2/15 0.13
Subadults	1/4 0.25	3/4 0.75	0/4 0	0/4 0

p-values (Fisher's exact) Pre-Urbanization	3	4	5
2	0.3571	1.0000	0.4857
3	-	n/a	n/a
4	-	-	n/a
p-values (Fisher's exact) Early Urbanization	**3**	**4**	**5**
2	0.2448	0.1429	0.1429
3	-	0.5280	0.5280
4	-	-	n/a
p-values (Fisher's exact) Late Urbanization	**3**	**4**	**5**
2	0.5594	1.0000	1.0000
3	-	0.4750	0.5000
4	-	-	n/a

Table B.139. Temporal comparison age differences in severity of dental calculus (N-individuals with level of severity/N-total individuals with calculus; prevalence rate)

Time Period	Left Mandibular M1	Left Mandibular M1	Left Mandibular M1
	Prevalence of Score of 4	Prevalence of Score of 5	Prevalence of Score of 6
Pre-Urbanization	5/14 0.36	3/14 0.21	5/14 0.36
Early Urbanization	3/10 0.30	2/10 0.20	0/10 0
Late Urbanization	2/9 0.22	4/9 0.44	1/9 0.11

Time Period	Left Mandibular M1	Left Mandibular M1
	Prevalence of Score of 7	Prevalence of Score of 8
Pre-Urbanization	1/14 0.07	0/14 0
Early Urbanization	4/10 0.40	1/10 0.10
Late Urbanization	2/9 0.22	0/9 0

p-values (Fisher's exact)	5	6	7	8
4				
pre vs. early	1.0000	0.2582	0.3147	0.4000
pre vs. late	0.3157	1.0000	0.5475	n/a
early vs. late	0.5671	1.0000	1.0000	1.0000
5				
pre vs. early	-	0.4444	0.5671	1.0000
pre vs. late	-	0.2657	1.0000	n/a
early vs. late	-	1.0000	0.5671	0.4286
6				
pre vs. early	-	-	0.0606	0.1667
pre vs. late	-	-	0.5000	n/a
early vs. late	-	-	0.4286	1.0000

Table B.140. Temporal comparison of dental wear (left mandibular M1) severity in adults (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Continued

Table B.140 continued				
p-values (Fisher's exact)	**5**	**6**	**7**	**8**
7				
pre vs. early	-	-	-	1.0000
pre vs. late	-	-	-	n/a
early vs. late	-	-	-	1.0000

Time Period	Left Mandibular M2	Left Mandibular M2	Left Mandibular M2
	Prevalence of Score of 3	Prevalence of Score of 4	Prevalence of Score of 5
Pre-Urbanization	2/11 0.18	7/1 0.64	2/11 0.18
Early Urbanization	5/12 0.42	1/12 0.08	1/12 0.08
Late Urbanization	2/9 0.22	4/9 0.44	1/9 0.11

Time Period	Left Mandibular M2	Left Mandibular M2
	Prevalence of Score of 6	Prevalence of Score of 7
Pre-Urbanization	0/11 0	0/11 0
Early Urbanization	3/12 0.25	2/12 0.17
Late Urbanization	2/9 0.22	0/9 0

p-values (Fisher's exact)	4	5	6	7
3				
pre vs. early	0.0406*	0.5000	1.0000	1.0000
pre vs. late	1.0000	1.0000	1.0000	n/a
early vs. late	0.2424	1.0000	1.0000	1.0000
4				
pre vs. early	-	0.4909	0.0319*	0.0667
pre vs. late	-	1.0000	0.5385	n/a
early vs. late	-	1.0000	0.2424	0.1429
5				
pre vs. early	-	-	0.4643	0.4000
pre vs. late	-	-	1.0000	n/a
early vs. late	-	-	1.0000	1.0000

Table B.141. Temporal comparison of dental wear (left mandibular M2) severity in adults (*significant, p≤0.05) (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Continued

Table B.141 continued				
p-values (Fisher's exact)	**4**	**5**	**6**	**7**
6				
pre vs. early	-	-	-	1.0000
pre vs. late	-	-	-	n/a
early vs. late	-	-	-	1.0000

Time Period	Right Mandibular M1	Right Mandibular M1	Right Mandibular M1
	Prevalence of Score of 4	**Prevalence of Score of 5**	**Prevalence of Score of 6**
Pre-Urbanization	2/9 0.22	2/9 0.22	4/9 0.44
Early Urbanization	4/9 0.44	0/9 0	2/9 0.22
Late Urbanization	3/6 0.50	1/6 0.17	1/6 0.17

Time Period	Right Mandibular M1	Right Mandibular M1
	Prevalence of Score of 7	**Prevalence of Score of 8**
Pre-Urbanization	0/9 0	1/9 0.11
Early Urbanization	1/9 0.11	2/9 0.22
Late Urbanization	1/6 0.17	0/6 0

p-values (Fisher's exact)	5	6	7	8
4				
pre vs. early	0.1667	0.5671	1.0000	1.0000
pre vs. late	0.5238	0.5238	1.0000	1.0000
early vs. late	1.0000	1.0000	1.0000	0.5000
5				
pre vs. early	-	0.5000	0.4000	0.4000
pre vs. late	-	1.0000	1.0000	1.0000
early vs. late	-	1.0000	1.0000	0.3333
6				
pre vs. early	-	-	1.0000	0.5238
pre vs. late	-	-	1.0000	1.0000
early vs. late	-	-	1.0000	1.0000

Table B.142. Temporal comparison of dental wear (right mandibular M1) severity in adults (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Continued

Table B.142 continued				
p-values (Fisher's exact)	**5**	**6**	**7**	**8**
7				
pre vs. early	-	-	-	1.0000
pre vs. late	-	-	-	1.0000
early vs. late	-	-	-	1.0000

Time Period	Right Mandibular M2	Right Mandibular M2	Right Mandibular M2
	Prevalence of Score of 2	Prevalence of Score of 3	Prevalence of Score of 4
Pre-Urbanization	0/14 0	1/14 0.17	8/14 0.57
Early Urbanization	1/10 0.10	3/10 0.30	1/10 0.10
Late Urbanization	1/10 0.10	3/10 0.30	3/10 0.30

Time Period	Right Mandibular M2	Right Mandibular M2
	Prevalence of Score of 5	Prevalence of Score of 6
Pre-Urbanization	4/14 0.29	1/14 0.07
Early Urbanization	3/10 0.30	2/10 0.20
Late Urbanization	0/10 0	3/10 0.30

p-values (Fisher's exact)	3	4	5	6
2				
pre vs. early	1.0000	0.1818	1.0000	1.0000
pre vs. late	1.0000	0.3077	0.2000	1.0000
early vs. late	1.0000	1.0000	0.4000	1.0000
3				
pre vs. early	-	0.0410*	0.5455	1.0000
pre vs. late	-	0.1181	0.1429	1.0000
early vs. late	-	0.5714	0.4643	1.0000
4				
pre vs. early	-	-	0.2500	0.1758
pre vs. late	-	-	0.5286	0.2801
early vs. late	-	-	0.1429	1.0000

Table B.143. Temporal comparison of dental wear (right mandibular M2) severity in adults (*significant, p≤0.05) (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Continued

Table B.143 continued				
p-values (Fisher's exact)	**3**	**4**	**5**	**6**
5				
pre vs. early	-	-	-	1.0000
pre vs. late	-	-	-	0.1667
early vs. late	-	-	-	0.1964

Time Period	Left Maxillary M1	Left Maxillary M1	Left Maxillary M1
	Prevalence of Score of 3	Prevalence of Score of 4	Prevalence of Score of 5
Pre-Urbanization	1/12 0.08	3/12 0.25	3/12 0.25
Early Urbanization	1/12 0.08	1/12 0.08	1/12 0.08
Late Urbanization	0/13 0	7/13 0.54	3/13 0.23
Time Period	Left Maxillary M1	Left Maxillary M1	Left Maxillary M1
	Prevalence of Score of 6	Prevalence of Score of 7	Prevalence of Score of 8
Pre-Urbanization	2/12 0.17	2/12 0.17	1/12 0.08
Early Urbanization	3/12 0.25	2/12 0.17	4/12 0.33
Late Urbanization	2/13 0.15	0/13 0	1/13 0.08

p-values (Fisher's exact)	4	5	6	7	8
3					
pre vs. early	1.0000	1.0000	1.0000	1.0000	1.0000
pre vs. late	0.3636	1.0000	1.0000	n/a	1.0000
early vs. late	0.2222	0.4000	1.0000	n/a	1.0000
4					
pre vs. early	-	1.0000	0.5238	1.0000	0.2063
pre vs. late	-	0.3500	0.5804	0.0699	1.0000
early vs. late	-	1.0000	0.0909	0.0667	0.0319*
5					
pre vs. early	-	-	0.2424	1.0000	0.2063
pre vs. late	-	-	1.0000	0.4750	1.0000
early vs. late	-	-	0.5238	0.4000	0.2063

Table B.144. Temporal comparison of dental wear (left maxillary M1) severity in adults (*significant, p≤0.05) (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Continued

Table B.144 continued					
p-values (Fisher's exact)	**4**	**5**	**6**	**7**	**8**
6					
pre vs. early	-	-	-	0.5671	1.0000
pre vs. late	-	-	-	0.4286	1.0000
early vs. late	-	-	-	1.0000	1.0000
7					
pre vs. early	-	-	-	-	0.5238
pre vs. late	-	-	-	-	0.4000
early vs. late	-	-	-	-	1.0000

Time Period	Left Maxillary M2	Left Maxillary M2	Left Maxillary M2
	Prevalence of Score of 2	Prevalence of Score of 3	Prevalence of Score of 4
Pre-Urbanization	0/6 0	3/6 0.50	1/6 0.17
Early Urbanization	0/8 0	1/8 0.13	3/8 0.38
Late Urbanization	1/11 0.09	6/11 0.55	3/11 0.27
Time Period	**Left Maxillary M2**	**Left Maxillary M2**	**Left Maxillary M2**
	Prevalence of Score of 5	**Prevalence of Score of 6**	**Prevalence of Score of 8**
Pre-Urbanization	2/6 0.33	0/6 0	0/6 0
Early Urbanization	1/8 0.13	2/8 0.25	1/8 0.13
Late Urbanization	1/11 0.09	0/11 0	0/11 0

p-values (Fisher's exact)	3	4	5	6	8
2					
pre vs. early	n/a	n/a	n/a	n/a	n/a
pre vs. late	1.0000	1.0000	1.0000	n/a	1.0000
early vs. late	1.0000	1.0000	1.0000	0.3333	1.0000
3					
pre vs. early	-	0.4857	1.0000	0.4000	1.0000
pre vs. late	-	1.0000	0.5227	n/a	0.4000
early vs. late	-	0.2657	0.1833	0.0833	0.2500
4					
pre vs. early	-	-	1.0000	1.0000	1.0000
pre vs. late	-	-	0.4857	n/a	0.4000
early vs. late	-	-	1.0000	0.4643	1.0000

Table B.145. Temporal comparison of dental wear (left maxillary M2) severity in adults (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Continued

Table B.145 continued					
p-values (Fisher's exact)	**3**	**4**	**5**	**6**	**8**
5					
pre vs. early	-	-	-	0.4667	1.0000
pre vs. late	-	-	-	n/a	1.0000
early vs. late	-	-	-	1.0000	1.0000
6					
pre vs. early	-	-	-	-	1.0000
pre vs. late	-	-	-	-	n/a
early vs. late	-	-	-	-	n/a

Time Period	Right Maxillary M1	Right Maxillary M1	Right Maxillary M1
	Prevalence of Score of 3	**Prevalence of Score of 4**	**Prevalence of Score of 5**
Pre-Urbanization	0/11 0	2/11 0.18	6/11 0.55
Early Urbanization	1/13 0.08	1/13 0.08	4/13 0.31
Late Urbanization	0/13 0	5/13 0.38	3/13 0.23
Time Period	**Right Maxillary M1**	**Right Maxillary M1**	**Right Maxillary M1**
	Prevalence of Score of 6	**Prevalence of Score of 7**	**Prevalence of Score of 8**
Pre-Urbanization	1/11 0.09	0/11 0	2/11 0.18
Early Urbanization	2/13 0.15	0/13 0	5/13 0.38
Late Urbanization	4/13 0.31	1/13 0.08	0/13 0

p-values (Fisher's exact)	4	5	6	7	8
3					
pre vs. early	1.0000	0.4167	1.0000	n/a	1.0000
pre vs. late	n/a	n/	n/a	n/a	n/a
early vs. late	0.2857	1.0000	1.0000	1.0000	n/a
4					
pre vs. early	-	1.0000	0.4857	n/a	0.5455
pre vs. late	-	0.1534	1.0000	1.0000	0.1667
early vs. late	-	0.2657	0.5594	1.0000	0.0152*
5					
pre vs. early	-	-	0.2821	n/a	0.3698
pre vs. late	-	-	0.1189	0.3636	0.5280
early vs. late	-	-	1.0000	1.0000	0.2045

Table B.146. Temporal comparison of dental wear (right maxillary M1) severity in adults (*significant, p≤0.05) (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Continued

Table B.146 continued

p-values (Fisher's exact)	4	5	6	7	8
6					
pre vs. early	-	-	-	n/a	1.0000
pre vs. late	-	-	-	1.0000	0.1429
early vs. late	-	-	-	1.0000	0.0808
7					
pre vs. early	-	-	-	-	n/a
pre vs. late	-	-	-	-	0.2500
early vs. late	-	-	-	-	0.1667

Time Period	Right Maxillary M2	Right Maxillary M2	Right Maxillary M2
	Prevalence of Score of 2	Prevalence of Score of 3	Prevalence of Score of 4
Pre-Urbanization	0/8 0	5/8 0.63	2/8 0.25
Early Urbanization	3/9 0.33	2/9 0.22	1/9 0.11
Late Urbanization	1/12 0.08	6/12 0.50	4/12 0.33
Time Period	**Right Maxillary M2**	**Right Maxillary M2**	**Right Maxillary M2**
	Prevalence of Score of 5	**Prevalence of Score of 7**	**Prevalence of Score of 8**
Pre-Urbanization	1/8 0.13	0/8 0	0/8 0
Early Urbanization	1/9 0.11	1/9 0.11	1/9 0.11
Late Urbanization	1/12 0.08	0/12 0	0/12 0

p-values (Fisher's exact)	3	4	5	7	8
2					
pre vs. early	0.1667	0.4000	0.4000	n/a	n/a
pre vs. late	1.0000	1.0000	1.0000	n/a	1.0000
early vs. late	0.2222	0.2063	1.0000	1.0000	1.0000
3					
pre vs. early	-	1.0000	1.0000	0.3750	0.3750
pre vs. late	-	1.0000	1.0000	n/a	n/a
early vs. late	-	1.0000	1.0000	0.3333	0.3333
4					
pre vs. early	-	-	1.0000	1.0000	1.0000
pre vs. late	-	-	0.5238	n/a	n/a
early vs. late	-	-	1.0000	0.3333	0.3333

Table B.147. Temporal comparison of dental wear (right maxillary M2) severity in adults (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Continued

Table B.147 continued					
p-values (Fisher's exact)	**3**	**4**	**5**	**7**	**8**
5					
pre vs. early	-	-	-	1.0000	1.0000
pre vs. late	-	-	-	n/a	n/a
early vs. late	-	-	-	1.0000	1.0000
7					
pre vs. early	-	-	-	-	n/a
pre vs. late	-	-	-	-	n/a
early vs. late	-	-	-	-	n/a

Time Period	Left Mandibular M1	Left Mandibular M1	Left Mandibular M1
	Prevalence of Score of 4	Prevalence of Score of 5	Prevalence of Score of 6
Pre-Urbanization	2/6 0.33	1/6 0.17	3/6 0.50
Early Urbanization	3/5 0.60	1/5 0.20	0/5 0
Late Urbanization	1/5 0.20	2/5 0.40	1/5 0.20

Time Period	Left Mandibular M1	Left Mandibular M1
	Prevalence of Score of 7	Prevalence of Score of 8
Pre-Urbanization	0/6 0	0/6 0
Early Urbanization	0/5 0	1/5 0.20
Late Urbanization	1/5 0.20	0/5 0

p-values (Fisher's exact)	5	6	7	8
4				
pre vs. early	1.0000	0.1964	n/a	1.0000
pre vs. late	1.0000	1.0000	1.0000	n/a
early vs. late	0.4857	0.4000	0.4000	1.0000
5				
pre vs. early	-	0.4000	n/a	1.0000
pre vs. late	-	0.4857	1.0000	n/a
early vs. late	-	1.0000	1.0000	1.0000
6				
pre vs. early	-	-	n/a	0.2500
pre vs. late	-	-	0.4000	n/a
early vs. late	-	-	n/a	1.0000

Table B.148. Temporal comparison of dental wear (left mandibular M1) severity in adult females (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Continued

Table B.148 continued				
p-values (Fisher's exact)	**5**	**6**	**7**	**8**
7				
pre vs. early	-	-	-	n/a
pre vs. late	-	-	-	n/a
early vs. late	-	-	-	1.0000

Time Period	Left Mandibular M2	Left Mandibular M2	Left Mandibular M2	Left Mandibular M2
	Prevalence of Score of 3	**Prevalence of Score of 4**	**Prevalence of Score of 5**	**Prevalence of Score of 6**
Pre-Urbanization	1/5 0.20	4/5 0.80	0/5 0	0/5 0
Early Urbanization	3/5 0.60	1/5 0.20	0/5 0	1/5 0.20
Late Urbanization	1/5 0.20	2/5 0.40	1/5 0.20	1/5 0.20

p-values (Fisher's exact)	4	5	6
3			
pre vs. early	0.2063	n/a	1.0000
pre vs. late	1.0000	1.0000	1.0000
early vs. late	0.4857	0.4000	1.0000
4			
pre vs. early	-	n/a	0.3333
pre vs. late	-	0.4286	0.4286
early vs. late	-	1.0000	1.0000
5			
pre vs. early	-	-	n/a
pre vs. late	-	-	n/a
early vs. late	-	-	1.0000

Table B.149. Temporal comparison of dental wear (left mandibular M2) severity in adult females (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Right Mandibular M1	Right Mandibular M1	Right Mandibular M1
	Prevalence of Score of 4	Prevalence of Score of 5	Prevalence of Score of 6
Pre-Urbanization	1/5 0.20	2/5 0.40	2/5 0.40
Early Urbanization	4/5 0.80	0/5 0	0/5 0
Late Urbanization	2/5 0.40	1/5 0.20	1/5 0.20

Time Period	Right Mandibular M1	Right Mandibular M1
	Prevalence of Score of 7	Prevalence of Score of 8
Pre-Urbanization	0/5 0	0/5 0
Early Urbanization	0/5 0	1/5 0.20
Late Urbanization	1/5 0.20	0/5 0

p-values (Fisher's exact)	5	6	7	8
4				
pre vs. early	0.1429	0.1429	n/a	1.0000
pre vs. late	1.0000	1.0000	1.0000	n/a
early vs. late	0.4286	0.4286	0.4286	1.0000
5				
pre vs. early	-	n/a	n/a	0.3333
pre vs. late	-	1.0000	1.0000	n/a
early vs. late	-	n/a	n/a	1.0000
6				
pre vs. early	-	-	n/a	0.3333
pre vs. late	-	-	1.0000	n/a
early vs. late	-	-	n/a	1.0000

Table B.150. Temporal comparison of dental wear (right mandibular M1) severity in adult females (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Continued

Table B.150 continued				
p-values (Fisher's exact)	**5**	**6**	**7**	**8**
7				
pre vs. early	-	-	-	n/a
pre vs. late	-	-	-	n/a
early vs. late	-	-	-	1.0000

Time Period	Right Mandibular M2	Right Mandibular M2	Right Mandibular M2
	Prevalence of Score of 2	Prevalence of Score of 3	Prevalence of Score of 4
Pre-Urbanization	0/6 0	1/6 0.17	5/6 0.83
Early Urbanization	1/7 0.14	3/7 0.43	0/7 0
Late Urbanization	1/6 0.17	1/6 0.17	3/6 0.50

p-values (Fisher's exact)	3	4
2		
pre vs. early	1.0000	0.1667
pre vs. late	1.0000	0.4444
early vs. late	1.0000	0.4000
3		
pre vs. early	-	0.0476*
pre vs. late	-	1.0000
early vs. late	-	0.1429

Table B.151. Temporal comparison of dental wear (right mandibular M1) severity in adult females (*significant, p≤0.05) (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Left Maxillary M1	Left Maxillary M1	Left Maxillary M1
	Prevalence of Score of 3	**Prevalence of Score of 4**	**Prevalence of Score of 5**
Pre-Urbanization	1/6 0.17	2/6 0.33	2/6 0.33
Early Urbanization	1/7 0.14	1/7 0.14	1/7 0.14
Late Urbanization	0/7 0	4/7 0.57	2/7 0.29
Time Period	**Left Maxillary M1**	**Left Maxillary M1**	**Left Maxillary M1**
	Prevalence of Score of 6	**Prevalence of Score of 7**	**Prevalence of Score of 8**
Pre-Urbanization	0/6 0	1/6 0.17	0/6 0
Early Urbanization	2/7 0.29	0/7 0	2/7 0.29
Late Urbanization	1/7 0.14	0/7 0	0/7 0

p-values (Fisher's exact)	4	5	6	7	8
3					
pre vs. early	1.0000	1.0000	1.0000	1.0000	1.0000
pre vs. late	0.4286	1.0000	1.0000	n/a	n/a
early vs. late	0.3333	1.0000	1.0000	n/a	n/a
4					
pre vs. early	-	1.0000	0.4000	1.0000	0.4000
pre vs. late	-	1.0000	1.0000	0.4286	n/a
early vs. late	-	1.0000	0.4643	n/a	0.1429
5					
pre vs. early	-	-	0.4000	1.0000	0.4000
pre vs. late	-	-	1.0000	1.0000	n/a
early vs. late	-	-	1.0000	n/a	0.4000

Table B.152. Temporal comparison of dental wear (left maxillary M1) severity in adult females (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Continued

Table B.152 continued					
p-values (Fisher's exact)	**4**	**5**	**6**	**7**	**8**
6					
pre vs. early	-	-	-	0.3333	n/a
pre vs. late	-	-	-	1.0000	n/a
early vs. late	-	-	-	n/a	1.0000
7					
pre vs. early	-	-	-	-	0.3333
pre vs. late	-	-	-	-	n/a
early vs. late	-	-	-	-	n/a

Time Period	Left Maxillary M2	Left Maxillary M2	Left Maxillary M2
	Prevalence of Score of 2	Prevalence of Score of 3	Prevalence of Score of 4
Pre-Urbanization	0/3 0	2/3 0.67	0/3 0
Early Urbanization	0/3 0	1/3 0.33	1/3 0.33
Late Urbanization	1/6 0.17	3/6 0.50	2/6 0.33

Time Period	Left Maxillary M2	Left Maxillary M2
	Prevalence of Score of 5	Prevalence of Score of 8
Pre-Urbanization	0/3 0	1/3 0.33
Early Urbanization	1/3 0.33	0/3 0
Late Urbanization	0/6 0	0/6 0

p-values (Fisher's exact)	3	4	5	8
2				
pre vs. early	n/a	n/a	n/a	n/a
pre vs. late	1.0000	n/a	n/a	1.0000
early vs. late	1.0000	1.0000	1.0000	n/a
3				
pre vs. early	-	1.0000	1.0000	1.0000
pre vs. late	-	1.0000	n/a	1.0000
early vs. late	-	1.0000	0.4000	n/a
4				
pre vs. early	-	-	n/a	1.0000
pre vs. late	-	-	n/a	0.3333
early vs. late	-	-	1.0000	n/a

Table B.153. Temporal comparison of dental wear (left maxillary M2) severity in adult females (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Continued

Table B.153 continued				
p-values (Fisher's exact)	**3**	**4**	**5**	**8**
5				
pre vs. early	-	-	-	1.0000
pre vs. late	-	-	-	n/a
early vs. late	-	-	-	n/a

Time Period	Right Maxillary M1	Right Maxillary M1	Right Maxillary M1
	Prevalence of Score of 3	Prevalence of Score of 4	Prevalence of Score of 5
Pre-Urbanization	0/6 0	2/6 0.33	3/6 0.50
Early Urbanization	1/7 0.14	1/7 0.14	2/7 0.29
Late Urbanization	0/7 0	3/7 0.43	1/7 0.14
Time Period	**Right Maxillary M1**	**Right Maxillary M1**	**Right Maxillary M1**
	Prevalence of Score of 6	**Prevalence of Score of 7**	**Prevalence of Score of 8**
Pre-Urbanization	0/6 0	0/6 0	1/6 0.17
Early Urbanization	1/7 0.14	0/7 0	2/7 0.29
Late Urbanization	2/7 0.29	1/7 0.24	0/7 0

p-values (Fisher's exact)	4	5	6	7	8
3					
pre vs. early	1.0000	1.0000	n/a	n/a	1.0000
pre vs. late	n/a	n/a	n/a	n/a	n/a
early vs. late	0.4000	1.0000	1.0000	1.0000	n/a
4					
pre vs. early	-	1.0000	1.0000	n/a	1.0000
pre vs. late	-	0.5238	1.0000	1.0000	1.0000
early vs. late	-	0.4857	1.0000	1.0000	0.4000
5					
pre vs. early	-	-	1.0000	n/a	1.0000
pre vs. late	-	-	0.4000	0.4000	1.0000
early vs. late	-	-	1.0000	1.0000	1.0000

Table B.154. Temporal comparison of dental wear (right maxillary M1) severity in adult females (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Continued

Table B.154 continued					
p-values (Fisher's exact)	**4**	**5**	**6**	**7**	**8**
6					
pre vs. early	-	-	-	n/a	1.0000
pre vs. late	-	-	-	n/a	0.3333
early vs. late	-	-	-	1.0000	0.4000
7					
pre vs. early	-	-	-	-	n/a
pre vs. late	-	-	-	-	1.0000
early vs. late	-	-	-	-	0.3333

Time Period	Right Maxillary M2	Right Maxillary M2	Right Maxillary M2
	Prevalence of Score of 2	Prevalence of Score of 3	Prevalence of Score of 4
Pre-Urbanization	0/5 0	4/5 0.80	0/5 0
Early Urbanization	2/5 0.40	2/5 0.40	0/5 0
Late Urbanization	1/7 0.14	3/7 0.43	3/7 0.43

Time Period	Right Maxillary M2	Right Maxillary M2
	Prevalence of Score of 5	Prevalence of Score of 8
Pre-Urbanization	1/5 0.20	0/5 0
Early Urbanization	0/5 0	1/5 0.20
Late Urbanization	0/7 0	0/7 0

p-values (Fisher's exact)	3	4	5	8
2				
pre vs. early	0.4286	n/a	0.3333	n/a
pre vs. late	1.0000	n/a	1.0000	n/a
early vs. late	1.0000	0.4000	n/a	1.0000
3				
pre vs. early	-	n/a	1.0000	0.4286
pre vs. late	-	0.2000	1.0000	n/a
early vs. late	-	0.4643	n/a	1.0000
4				
pre vs. early	-	-	n/a	n/a
pre vs. late	-	-	0.2500	n/a
early vs. late	-	-	n/a	0.2500

Table B.155. Temporal comparison of dental wear (right maxillary M2) severity in adult females (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Continued

Table B.155 continued				
p-values (Fisher's exact)	**3**	**4**	**5**	**8**
5				
pre vs. early	-	-	-	1.0000
pre vs. late	-	-	-	n/a
early vs. late	-	-	-	n/a

Time Period	Left Mandibular M1	Left Mandibular M1	Left Mandibular M1	Left Mandibular M1
	Prevalence of Score of 4	**Prevalence of Score of 5**	**Prevalence of Score of 6**	**Prevalence of Score of 7**
Pre-Urbanization	4/8 0.50	1/8 0.13	2/8 0.25	1/8 0.13
Early Urbanization	1/5 0.20	1/5 0.20	0/5 0	3/5 0.60
Late Urbanization	1/4 0.25	2/4 0.50	0/4 0	1/4 0.25

p-values (Fisher's exact)	5	6	7
4			
pre vs. early	1.0000	1.0000	0.2063
pre vs. late	0.4643	1.0000	1.0000
early vs. late	1.0000	n/a	1.0000
5			
pre vs. early	-	1.0000	1.0000
pre vs. late	-	0.4000	1.0000
early vs. late	-	n/a	0.4857
6			
pre vs. early	-	-	0.4000
pre vs. late	-	-	1.0000
early vs. late	-	-	n/a

Table B.156. Temporal comparison of dental wear (left mandibular M1) severity in adult males (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Left Mandibular M2	Left Mandibular M2	Left Mandibular M2
	Prevalence of Score of 3	Prevalence of Score of 4	Prevalence of Score of 5
Pre-Urbanization	1/5 0.20	2/5 0.40	1/5 0.20
Early Urbanization	2/6 0.33	0/6 0	1/6 0.17
Late Urbanization	1/4 0.25	2/4 0.50	0/4 0

Time Period	Left Mandibular M2	Left Mandibular M2
	Prevalence of Score of 6	Prevalence of Score of 7
Pre-Urbanization	1/5 0.20	0/5 0
Early Urbanization	2/6 0.33	1/6 0.17
Late Urbanization	1/4 0.25	0/4 0

p-values (Fisher's exact)	4	5	6	7
3				
pre vs. early	0.4000	1.0000	1.0000	1.0000
pre vs. late	1.0000	1.0000	1.0000	n/a
early vs. late	0.4000	1.0000	1.0000	1.0000
4				
pre vs. early	-	1.0000	0.4000	0.3333
pre vs. late	-	1.0000	1.0000	n/a
early vs. late	-	0.3333	0.4000	0.3333
5				
pre vs. early	-	-	1.0000	1.0000
pre vs. late	-	-	1.0000	n/a
early vs. late	-	-	1.0000	n/a

Table B.157. Temporal comparison of dental wear (left mandibular M2) severity in adult males (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Continued

Table B.157 continued				
p-values (Fisher's exact)	**4**	**5**	**6**	**7**
6				
pre vs. early	-	-	-	1.0000
pre vs. late	-	-	-	n/a
early vs. late	-	-	-	1.0000

Time Period	Right Mandibular M1	Right Mandibular M1	Right Mandibular M1
	Prevalence of Score of 4	Prevalence of Score of 5	Prevalence of Score of 6
Pre-Urbanization	1/5 0.20	1/5 0.20	2/5 0.40
Early Urbanization	1/4 0.25	0/4 0	1/4 0.25
Late Urbanization	1/1 1.00	0/1 0	0/1 0

Time Period	Right Mandibular M1	Right Mandibular M1
	Prevalence of Score of 7	Prevalence of Score of 8
Pre-Urbanization	1/5 0.20	0/5 0
Early Urbanization	1/4 0.25	1/4 0.25
Late Urbanization	0/1 0	0/1 0

p-values (Fisher's exact)	5	6	7	8
4				
pre vs. early	1.0000	1.0000	1.0000	1.0000
pre vs. late	1.0000	1.0000	1.0000	n/a
early vs. late	n/a	1.0000	1.0000	1.0000
5				
pre vs. early	-	1.0000	1.0000	1.0000
pre vs. late	-	n/a	n/a	n/a
early vs. late	-	n/a	n/a	n/a
6				
pre vs. early	-	-	1.0000	1.0000
pre vs. late	-	-	n/a	n/a
early vs. late	-	-	n/a	n/a

Table B.158. Temporal comparison of dental wear (right mandibular M1) severity in adult males (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Continued

Table B.158 continued				
p-values (Fisher's exact)	**5**	**6**	**7**	**8**
7				
pre vs. early	-	-	-	1.0000
pre vs. late	-	-	-	n/a
early vs. late	-	-	-	n/a

Time Period	Right Mandibular M2	Right Mandibular M2	Right Mandibular M2
	Prevalence of Score of 3	Prevalence of Score of 4	Prevalence of Score of 5
Pre-Urbanization	0/9 0	4/9 0.44	3/9 0.33
Early Urbanization	1/6 0.17	1/6 0.17	1/6 0.17
Late Urbanization	2/4 0.50	0/4 0	0/4 0

Time Period	Right Mandibular M2	Right Mandibular M2
	Prevalence of Score of 6	Prevalence of Score of 7
Pre-Urbanization	2/9 0.22	0/9 0
Early Urbanization	2/6 0.33	1/6 0.17
Late Urbanization	2/4 0.50	0/4 0

p-values (Fisher's exact)	4	5	6	7
3				
pre vs. early	0.3333	0.4000	1.0000	n/a
pre vs. late	0.0667	0.1000	0.4667	n/a
early vs. late	1.0000	1.0000	1.0000	1.0000
4				
pre vs. early	-	1.0000	0.5238	0.3333
pre vs. late	-	n/a	0.4286	n/a
early vs. late	-	n/a	1.0000	n/a
5				
pre vs. early	-	-	1.0000	0.4000
pre vs. late	-	-	0.4286	n/a
early vs. late	-	-	1.0000	n/a

Table B.159. Temporal comparison of dental wear (right mandibular M2) severity in adult males (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Continued

Table B.159 continued				
p-values (Fisher's exact)	**4**	**5**	**6**	**7**
6				
pre vs. early	-	-	-	1.0000
pre vs. late	-	-	-	n/a
early vs. late	-	-	-	1.0000

Time Period	Left Maxillary M1	Left Maxillary M1	Left Maxillary M1
	Prevalence of Score of 3	Prevalence of Score of 4	Prevalence of Score of 5
Pre-Urbanization	0.7 0	1/7 0.14	2/7 0.29
Early Urbanization	1/5 0.20	0/5 0	0/5 0
Late Urbanization	0/4 0	2/4 0.50	1/4 0.25
Time Period	Left Maxillary M1	Left Maxillary M1	Left Maxillary M1
	Prevalence of Score of 6	Prevalence of Score of 7	Prevalence of Score of 8
Pre-Urbanization	2/7 0.29	1/7 0.14	1/7 0.14
Early Urbanization	0/5 0	2/5 0.40	2/5 0.40
Late Urbanization	0/4 0	0/4 0	1/4 0.25

p-values (Fisher's exact)	4	5	6	7	8
3					
pre vs. early	1.0000	0.3333	0.3333	1.0000	1.0000
pre vs. late	n/a	n/a	n/a	n/a	n/a
early vs. late	0.3333	1.0000	n/a	n/a	1.0000
4					
pre vs. early	-	n/a	n/a	1.0000	1.0000
pre vs. late	-	1.0000	0.4000	1.0000	1.0000
early vs. late	-	n/a	n/a	0.3333	0.4000
5					
pre vs. early	-	-	n/a	0.4000	0.4000
pre vs. late	-	-	1.0000	1.0000	1.0000
early vs. late	-	-	n/a	0.3333	1.0000

Table B.160. Temporal comparison of dental wear (left maxillary M1) severity in adult males (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Continued

Table B.160 continued					
p-values (Fisher's exact)	**4**	**5**	**6**	**7**	**8**
6					
pre vs. early	-	-	-	0.4000	0.4000
pre vs. late	-	-	-	n/a	1.0000
early vs. late	-	-	-	n/a	n/a
7					
pre vs. early	-	-	-	-	1.0000
pre vs. late	-	-	-	-	1.0000
early vs. late	-	-	-	-	1.0000

Time Period	Left Maxillary M2	Left Maxillary M2	Left Maxillary M2
	Prevalence of Score of 2	Prevalence of Score of 3	Prevalence of Score of 4
Pre-Urbanization	0/4 0	1/4 0.25	1/4 0.25
Early Urbanization	1/5 0.20	0/5 0	0/5 0
Late Urbanization	0/4 0	2/4 0.50	1/4 0.25
Time Period	**Left Maxillary M2**	**Left Maxillary M2**	**Left Maxillary M2**
	Prevalence of Score of 5	**Prevalence of Score of 6**	**Prevalence of Score of 8**
Pre-Urbanization	2/4 0.50	0/4 0	0/4 0
Early Urbanization	1/5 0.20	2/5 0.40	1/5 0.20
Late Urbanization	1/4 0.25	0/4 0	0/4 0

p-values (Fisher's exact)	3	4	5	6	8
2					
pre vs. early	1.0000	1.0000	1.0000	n/a	n/a
pre vs. late	n/a	n/a	n/a	n/a	n/a
early vs. late	0.3333	1.0000	1.0000	n/a	n/a
3					
pre vs. early	-	n/a	1.0000	0.3333	1.0000
pre vs. late	-	1.0000	1.0000	n/a	n/a
early vs. late	-	n/a	1.0000	0.3333	0.3333
4					
pre vs. early	-	-	1.0000	0.3333	1.0000
pre vs. late	-	-	1.0000	n/a	n/a
early vs. late	-	-	1.0000	0.3333	1.0000

Table B.161. Temporal comparison of dental wear (left maxillary M2) severity in adult males (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Continued

Table B.161 continued					
p-values (Fisher's exact)	**3**	**4**	**5**	**6**	**8**
5					
pre vs. early	-	-	-	0.4000	1.0000
pre vs. late	-	-	-	n/a	n/a
early vs. late	-	-	-	1.0000	1.0000
6					
pre vs. early	-	-	-	-	n/a
pre vs. late	-	-	-	-	n/a
early vs. late	-	-	-	-	n/a

Time Period	Right Maxillary M1	Right Maxillary M1	Right Maxillary M1	Right Maxillary M1
	Prevalence of Score of 4	**Prevalence of Score of 5**	**Prevalence of Score of 6**	**Prevalence of Score of 8**
Pre-Urbanization	0/6 0	4/6 0.67	0/6 0	2/6 0.33
Early Urbanization	1/5 0.20	1/5 0.20	0/5 0	3/5 0.60
Late Urbanization	2/4 0.50	1/4 0.25	1/4 0.25	0/4 0

p-values (Fisher's exact)	5	6	8
4			
pre vs. early	0.3333	n/a	1.0000
pre vs. late	0.1429	n/a	0.3333
early vs. late	1.0000	1.0000	0.4000
5			
pre vs. early	-	n/a	0.5238
pre vs. late	-	0.3333	1.0000
early vs. late	-	1.0000	0.4000
6			
pre vs. early	-	-	n/a
pre vs. late	-	-	0.3333
early vs. late	-	-	0.2500

Table B.162. Temporal comparison of dental wear (right maxillary M1) severity in adult males (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Right Maxillary M2	Right Maxillary M2	Right Maxillary M2
	Prevalence of Score of 2	Prevalence of Score of 3	Prevalence of Score of 4
Pre-Urbanization	0/3 0	1/3 0.33	1/3 0.33
Early Urbanization	2/4 0.50	0/4 0	0/4 0
Late Urbanization	0/4 0	2/4 0.50	1/4 0.25

Time Period	Right Maxillary M2	Right Maxillary M2
	Prevalence of Score of 5	Prevalence of Score of 7
Pre-Urbanization	1/3 0.33	0/3 0
Early Urbanization	1/4 0.25	1/4 0.25
Late Urbanization	1/4 0.25	0/4 0

p-values (Fisher's exact)	3	4	5	7
2				
pre vs. early	0.3333	0.3333	1.0000	n/a
pre vs. late	n/a	n/a	n/a	n/a
early vs. late	0.3333	0.3333	1.0000	n/a
3				
pre vs. early	-	n/a	1.0000	1.0000
pre vs. late	-	1.0000	1.0000	n/a
early vs. late	-	n/a	1.0000	0.3333
4				
pre vs. early	-	-	1.0000	1.0000
pre vs. late	-	-	1.0000	n/a
early vs. late	-	-	1.0000	1.0000

Table B.163. Temporal comparison of dental wear (right maxillary M2) severity in adult males (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Continued

Table B.163 continued				
p-values (Fisher's exact)	**3**	**4**	**5**	**7**
5				
pre vs. early	-	-	-	1.0000
pre vs. late	-	-	-	n/a
early vs. late	-	-	-	1.0000

Time Period	Left Mandibular M1	Left Mandibular M1	Left Mandibular M1	Left Mandibular M1
	Prevalence of Score of 1	**Prevalence of Score of 2**	**Prevalence of Score of 3**	**Prevalence of Score of 4**
Pre-Urbanization	6/6 1.00	0/6 0	0/6 0	0/6 0
Early Urbanization	3/10 0.30	6/10 0.60	0/10 0	1/10 0.10
Late Urbanization	3/5 0.60	0/5 0	1/5 0.20	1/5 0.20

p-values (Fisher's exact)	2	3	4
1			
pre vs. early	0.0278*	n/a	0.4000
pre vs. late	n/a	0.4000	0.4000
early vs. late	0.1818	1.0000	1.0000
2			
pre vs. early	-	n/a	n/a
pre vs. late	-	n/a	n/a
early vs. late	-	0.1429	0.2500
3			
pre vs. early	-	-	n/a
pre vs. late	-	-	n/a
early vs. late	-	-	1.0000

Table B.164. Temporal comparison of dental wear (left mandibular M1) severity in subadults (*significant, p≤0.05) (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	**Left Mandibular M2**	**Left Mandibular M2**	**Left Mandibular M2**
	Prevalence of Score of 1	**Prevalence of Score of 2**	**Prevalence of Score of 3**
Pre-Urbanization	n/a	n/a	n/a
Early Urbanization	3/5 0.60	0/5 0	2/5 0.40
Late Urbanization	0/2 0	1/2 0.50	1/2 0.50

p-values (Fisher's exact)	**2**	**3**
1		
pre vs. early	n/a	n/a
pre vs. late	n/a	n/a
early vs. late	0.2500	1.0000
2		
pre vs. early	-	n/a
pre vs. late	-	n/a
early vs. late	-	1.0000

Table B.165. Temporal comparison of dental wear (left mandibular M2) severity in subadults (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Right Mandibular M1	Right Mandibular M1	Right Mandibular M1	Right Mandibular M1
	Prevalence of Score of 1	**Prevalence of Score of 2**	**Prevalence of Score of 3**	**Prevalence of Score of 4**
Pre-Urbanization	6/7 0.86	1/7 0.14	0/7 0	0/7 0
Early Urbanization	2/9 0.22	5/9 0.56	1/9 0.11	1/9 0.11
Late Urbanization	2/4 0.50	0/4 0	2/4 0.50	0/4 0

p-values (Fisher's exact)	2	3	4
1			
pre vs. early	0.1026	0.3333	0.3333
pre vs. late	1.0000	0.1333	n/a
early vs. late	0.1667	1.0000	1.0000
2			
pre vs. early	-	1.0000	1.0000
pre vs. late	-	0.3333	n/a
early vs. late	-	0.1071	n/a
3			
pre vs. early	-	-	n/a
pre vs. late	-	-	n/a
early vs. late	-	-	1.0000

Table B.166. Temporal comparison of dental wear (right mandibular M1) severity in subadults (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Right Mandibular M2	Right Mandibular M2	Right Mandibular M2
	Prevalence of Score of 1	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization	n/a	n/a	n/a
Early Urbanization	3/5 0.60	1/5 0.20	1/5 0.20
Late Urbanization	0/2 0	2/2 1.00	0/2 0

p-values (Fisher's exact)	2	3
1		
pre vs. early	n/a	n/a
pre vs. late	n/a	n/a
early vs. late	0.4000	n/a
2		
pre vs. early	-	n/a
pre vs. late	-	n/a
early vs. late	-	1.0000

Table B.167. Temporal comparison of dental wear (right mandibular M2) severity in subadults (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Left Maxillary M1	Left Maxillary M1	Left Maxillary M1
	Prevalence of Score of 1	**Prevalence of Score of 2**	**Prevalence of Score of 3**
Pre-Urbanization	8/8 1.00	0/8 0	0/8 0
Early Urbanization	5/9 0.56	3/9 0.33	1/9 0.11
Late Urbanization	2/3 0.67	1/3 0.33	0/3 0

p-values (Fisher's exact)	2	3
1		
pre vs. early	0.2000	0.4286
pre vs. late	0.2727	n/a
early vs. late	1.0000	1.0000
2		
pre vs. early	-	n/a
pre vs. late	-	n/a
early vs. late	-	1.0000

Table B.168. Temporal comparison of dental wear (left maxillary M1) severity in subadults (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Left Maxillary M2	Left Maxillary M2
	Prevalence of Score of 1	**Prevalence of Score of 2**
Pre-Urbanization	n/a	n/a
Early Urbanization	2/4 0.50	2/4 0.50
Late Urbanization	0/2 1.00	2/2 1.00
p-value (chi-square)	n/a	n/a
p-value (Fisher's exact)	0.4667	0.4667

Table B.169. Temporal comparison of dental wear (left maxillary M2) severity in subadults (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Right Maxillary M1	Right Maxillary M1	Right Maxillary M1	Right Maxillary M1
	Prevalence of Score of 1	**Prevalence of Score of 2**	**Prevalence of Score of 3**	**Prevalence of Score of 4**
Pre-Urbanization	7/7 1.00	0/7 0	0/7 0	0/7 0
Early Urbanization	3/7 0.43	3/7 0.43	0/7 0	1/7 0.14
Late Urbanization	3/6 0.50	0/6 0	3/6 0.50	0/6 0

p-values (Fisher's exact)	2	3	4
1			
pre vs. early	0.0699	n/a	0.3636
pre vs. late	n/a	0.0699	n/a
early vs. late	0.4643	0.4643	1.0000
2			
pre vs. early	-	n/a	n/a
pre vs. late	-	n/a	n/a
early vs. late	-	1.0000	n/a
3			
pre vs. early	-	-	n/a
pre vs. late	-	-	n/a
early vs. late	-	-	0.2500

Table B.170. Temporal comparison of dental wear (right maxillary M1) severity in subadults (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Right Maxillary M2	Right Maxillary M2
	Prevalence of Score of 1	**Prevalence of Score of 2**
Pre-Urbanization	n/a	n/a
Early Urbanization	4/5 0.80	1/5 0.20
Late Urbanization	0/3 0	3/3 1.00
p-value (chi-square)	n/a	n/a
p-value (Fisher's exact)	0.1429	0.1429

Table B.171. Temporal comparison of dental wear (right maxillary M2) severity in subadults (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Left Mandibular M1	Left Mandibular M1	Left Mandibular M1
	Prevalence of Score of 4	Prevalence of Score of 5	Prevalence of Score of 6
Pre-Urbanization			
Females	2/6 0.33	1/6 0.17	3/6 0.50
Males	4/8 0.50	1/8 0.13	2/8 0.25
Early Urbanization			
Females	3/5 0.60	1/5 0.20	n/a
Males	1/5 0.20	1/5 0.20	n/a
Late Urbanization			
Females	1/5 0.20	2/5 0.40	1/5 0.20
Males	1/4 0.25	2/4 0.50	0/4 0

Time Period	Left Mandibular M1	Left Mandibular M1
	Prevalence of Score of 7	Prevalence of Score of 8
Pre-Urbanization		
Females	0/6 0	n/a
Males	1/8 0.13	n/a

Table B.172. Temporal comparison of sex differences in dental wear (left mandibular M1) severity (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Continued

Table B.172 continued		
Early Urbanization		
Females	0/5 0	1/5 0.20
Males	3/5 0.60	0/5 0
Late Urbanization		
Females	1/5 0.20	n/a
Males	1/4 0.25	n/a

p-values (Fisher's exact) Pre-Urbanization	**5**	**6**	**7**
4	1.0000	0.5671	1.0000
5	-	1.0000	1.0000
6	-	-	1.0000
p-values (Fisher's exact) Early Urbanization	**5**	**7**	**8**
4	1.0000	0.1429	1.0000
5	-	0.4000	1.0000
7	-	-	0.2500
p-values (Fisher's exact) Late Urbanization	**5**	**6**	**7**
4	1.0000	1.0000	1.0000
5	-	1.0000	1.0000
6	-	-	1.0000

Time Period	Left Mandibular M2	Left Mandibular M2	Left Mandibular M2
	Prevalence of Score of 3	Prevalence of Score of 4	Prevalence of Score of 5
Pre-Urbanization			
Females	1/5 0.20	4/5 0.80	0/5 0
Males	1/5 0.20	2/5 0.40	1/5 0.20
Early Urbanization			
Females	3/5 0.60	1/5 0.20	0/5 0
Males	2/6 0.33	0/6 0	1/6 0.17
Late Urbanization			
Females	1/5 0.20	2/5 0.40	1/5 0.20
Males	1/4 0.25	2/4 0.50	0/4 0

Time Period	Left Mandibular M2	Left Mandibular M2
	Prevalence of Score of 6	Prevalence of Score of 7
Pre-Urbanization		
Females	0/5 0	n/a
Males	1/5 0.20	n/a

Table B.173. Temporal comparison of sex differences in dental wear (left mandibular M2) severity (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Continued

Table B.173 continued		
Early Urbanization		
Females	1/5 0.20	0/5 0
Males	2/6 0.33	1/6 0.17
Late Urbanization		
Females	1/5 0.20	n/a
Males	1/4 0.25	n/a

p-values (Fisher's exact) Pre-Urbanization	**4**	**5**	**6**	**-**
3	1.0000	1.0000	1.0000	-
4	-	0.4286	0.4286	-
5	-	-	n/a	-
p-values (Fisher's exact) Early Urbanization	**4**	**5**	**6**	**7**
3	1.0000	1.0000	1.0000	1.0000
4	-	1.0000	1.0000	1.0000
5	-	-	1.0000	n/a
6				1.0000
p-values (Fisher's exact) Late Urbanization	**4**	**5**	**6**	**-**
3	1.0000	1.0000	1.0000	-
4	-	1.0000	1.0000	-
5	-	-	1.0000	-

Time Period	Right Mandibular M1	Right Mandibular M1	Right Mandibular M1
	Prevalence of Score of 4	Prevalence of Score of 5	Prevalence of Score of 6
Pre-Urbanization			
Females	1/5 0.20	2/5 0.40	2/5 0.40
Males	1/5 0.20	1/5 0.20	2/5 0.40
Early Urbanization			
Females	4/5 0.80	n/a	0/5 0
Males	1/4 0.25	n/a	1/4 0.25
Late Urbanization			
Females	2/5 0.40	1/5 0.20	1/5 0.20
Males	1/1 1.00	0/1 0	0/1 0

Time Period	Right Mandibular M1	Right Mandibular M1
	Prevalence of Score of 7	Prevalence of Score of 8
Pre-Urbanization		
Females	0/5 0	n/a
Males	1/5 0.20	n/a

Table B.174. Temporal comparison of sex differences in dental wear (right mandibular M1) severity (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Continued

Table B.174 continued		
Early Urbanization		
Females	0/5 0	1/5 0.20
Males	1/4 0.25	1/4 0.25
Late Urbanization		
Females	1/5 0.20	n/a
Males	0/1 0	n/a

p-values (Fisher's exact) Pre-Urbanization	**5**	**6**	**7**
4	1.0000	1.0000	1.0000
5	-	1.0000	1.0000
6	-	-	1.0000
p-values (Fisher's exact) Early Urbanization	**6**	**7**	**8**
4	0.3333	0.3333	1.0000
6	-	n/a	1.0000
7	-	-	1.0000
p-values (Fisher's exact) Late Urbanization	**5**	**6**	**7**
4	1.0000	1.0000	1.0000
5	-	n/a	n/a
6	-	-	n/a

Time Period	Right Mandibular M2	Right Mandibular M2	Right Mandibular M2
	Prevalence of Score of 2	Prevalence of Score of 3	Prevalence of Score of 4
Pre-Urbanization			
Females	n/a	1/6 0.17	5/6 0.83
Males	n/a	0/9 0	4/9 0.44
Early Urbanization			
Females	1/7 0.14	3/7 0.43	0/7 0
Males	0/6 0	1/6 0.17	1/6 0.17
Late Urbanization			
Females	1/6 0.17	1/6 0.17	3/6 0.50
Males	0/4 0	2/4 0.50	0/4 0
Time Period	**Right Mandibular M2**	**Right Mandibular M2**	**Right Mandibular M2**
	Prevalence of Score of 5	**Prevalence of Score of 6**	**Prevalence of Score of 7**
Pre-Urbanization			
Females	0/6 0	0/6 0	n/a
Males	3/9 0.33	2/9 0.22	n/a

Table B.175. Temporal comparison of sex differences in dental wear (right mandibular M2) severity (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Continued

Table B.175 continued			
Early Urbanization			
Females	1/7 0.14	0/7 0	2/7 0.29
Males	1/6 0.17	2/6 0.33	1/6 0.17
Late Urbanization			
Females	n/a	1/6 0.17	n/a
Males	n/a	2/4 0.50	n/a

p-values (Fisher's exact) Pre-Urbanization	**4**	**5**	**6**	**-**	**-**
3	1.0000	0.2500	0.3333	-	-
4	-	0.2045	0.4545	-	-
5	-	-	n/a	-	-
p-values (Fisher's exact) Early Urbanization	**3**	**4**	**5**	**6**	**7**
2	1.0000	1.0000	1.0000	0.3333	1.0000
3	-	0.4000	1.0000	0.4000	1.0000
4	-	-	1.0000	n/a	1.0000
5	-	-	-	1.0000	1.0000
6	-	-	-	-	0.4000
p-values (Fisher's exact) Late Urbanization	**3**	**4**	**6**	**-**	**-**
2	1.0000	n/a	1.0000	-	-
3	-	0.4000	1.0000	-	-
4	-	-	0.4000	-	-

Time Period	Left Maxillary M1	Left Maxillary M1	Left Maxillary M1
	Prevalence of Score of 3	**Prevalence of Score of 4**	**Prevalence of Score of 5**
Pre-Urbanization			
Females	1/6 0.17	2/6 0.33	2/6 0.33
Males	0/7 0	1/7 0.14	2/7 0.29
Early Urbanization			
Females	1/7 0.14	1/7 0.14	1/7 0.14
Males	1/5 0.20	0/5 0	0/5 0
Late Urbanization			
Females	n/a	4/7 0.57	2/7 0.29
Males	n/a	2/4 0.50	1/4 0.25
Time Period	**Left Maxillary M1**	**Left Maxillary M1**	**Left Maxillary M1**
	Prevalence of Score of 6	**Prevalence of Score of 7**	**Prevalence of Score of 8**
Pre-Urbanization			
Females	0/6 0	1/6 0.17	0/6 0
Males	2/7 0.29	1/7 0.14	1/7 0.14

Table B.176. Temporal comparison of sex differences in dental wear (left maxillary M1) severity (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Continued

Table B.176 continued			
Early Urbanization			
Females	2/7 0.29	0/7 0	2/7 0.29
Males	0/5 0	2/5 0.40	2/5 0.40
Late Urbanization			
Females	1/7 0.14	n/a	0/7 0
Males	0/4 0	n/a	1/4 0.25

p-values (Fisher's exact) Pre-Urbanization	**4**	**5**	**6**	**7**	**8**
3	1.0000	1.0000	0.3333	1.0000	1.0000
4	-	1.0000	0.4000	1.0000	1.0000
5	-	-	0.4667	1.0000	1.0000
6	-	-	-	1.0000	n/a
7	-	-	-	-	1.0000
p-values (Fisher's exact) Early Urbanization	**4**	**5**	**6**	**7**	**8**
3	1.0000	1.0000	1.0000	1.0000	1.0000
4	-	n/a	n/a	0.3333	1.0000
5	-	-	n/a	0.3333	1.0000
6	-	-	-	0.3333	0.4667
7	-	-	-	-	0.4667
p-values (Fisher's exact) Late Urbanization	**5**	**6**	**8**	**-**	**-**
4	1.0000	1.0000	0.4286	-	-
5	-	1.0000	1.0000	-	-
6	-	-	1.0000	-	-

Time Period	Left Maxillary M2	Left Maxillary M2	Left Maxillary M2
	Prevalence of Score of 2	**Prevalence of Score of 3**	**Prevalence of Score of 4**
Pre-Urbanization			
Females	n/a	2/3 0.67	0/3 0
Males	n/a	1/4 0.25	1/4 0.25
Early Urbanization			
Females	0/3 0	1/3 0.33	1/3 0.33
Males	1/5 0.20	0/5 0	0/5 0
Late Urbanization			
Females	1/6 0.17	3/6 0.50	2/6 0.33
Males	0/4 0	2/4 0.50	1/4 0.25
Time Period	**Left Maxillary M2**	**Left Maxillary M2**	**Left Maxillary M2**
	Prevalence of Score of 5	**Prevalence of Score of 6**	**Prevalence of Score of 8**
Pre-Urbanization			
Females	0/3 0	n/a	1/3 0.33
Males	2/4 0.50	n/a	0/4 0

Table B.177. Temporal comparison of sex differences in dental wear (left maxillary M2) severity (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Continued

Table B.177 continued			
Early Urbanization			
Females	1/3 0.33	0/3 0	0/3 0
Males	1/5 0.20	2/5 0.40	1/5 0.20
Late Urbanization			
Females	0/6 0	n/a	n/a
Males	1/4 0.25	n/a	n/a

p-values (Fisher's exact) Pre-Urbanization	**4**	**5**	**8**	**-**	**-**
3	1.0000	0.4000	1.0000	-	-
4	-	n/a	1.0000	-	-
5	-	-	0.3333	-	-
p-values (Fisher's exact) Early Urbanization	**3**	**4**	**5**	**6**	**8**
2	1.0000	1.0000	1.0000	n/a	n/a
3	-	n/a	1.0000	0.3333	1.0000
4	-	-	1.0000	0.3333	1.0000
5	-	-	-	1.0000	1.0000
6	-	-	-	-	n/a
p-values (Fisher's exact) Late Urbanization	**3**	**4**	**5**	**-**	**-**
2	1.0000	1.0000	1.0000	-	-
3	-	1.0000	1.0000	-	-
4	-	-	1.0000	-	-

Time Period	Right Maxillary M1 Prevalence of Score of 3	Right Maxillary M1 Prevalence of Score of 4	Right Maxillary M1 Prevalence of Score of 5
Pre-Urbanization			
Females	n/a	2/6 0.33	3/6 0.50
Males	n/a	0/6 0	4/6 0.67
Early Urbanization			
Females	1/7 0.14	1/7 0.14	2/7 0.29
Males	0/5 0	1/5 0.20	1/5 0.20
Late Urbanization			
Females	n/a	3/7 0.43	1/7 0.14
Males	n/a	2/4 0.50	1/4 0.25
	Right Maxillary M1	Right Maxillary M1	Right Maxillary M1
Time Period	Prevalence of Score of 6	Prevalence of Score of 7	Prevalence of Score of 8
Pre-Urbanization			
Females	n/a	n/a	1/6 0.17
Males	n/a	n/a	2/6 0.33

Table B.178. Temporal comparison of sex differences in dental wear (right maxillary M1) severity (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Continued

Table B.178 continued			
Early Urbanization			
Females	1/7 0.14	n/a	2/7 0.29
Males	0/5 0	n/a	3/5 0.60
Late Urbanization			
Females	2/7 0.29	1/7 0.14	n/a
Males	1/4 0.25	0/4 0	n/a

p-values (Fisher's exact) Pre-Urbanization	**5**	**6**	**-**	**-**
4	0.4444	0.4000	-	-
5	-	1.0000	-	-
p-values (Fisher's exact) Early Urbanization	**4**	**5**	**6**	**8**
3	1.0000	1.0000	n/a	1.0000
4	-	1.0000	1.0000	1.0000
5	-	-	1.0000	1.0000
6	-	-	-	1.0000
p-values (Fisher's exact) Late Urbanization	**5**	**6**	**7**	**-**
4	1.0000	1.0000	1.0000	-
5	-	1.0000	1.0000	-
6	-	-	1.0000	-

Time Period	Right Maxillary M2	Right Maxillary M2	Right Maxillary M2
	Prevalence of Score of 2	**Prevalence of Score of 3**	**Prevalence of Score of 4**
Pre-Urbanization			
Females	n/a	4/5 0.80	0/5 0
Males	n/a	1/3 0.33	1/3 0.33
Early Urbanization			
Females	2/5 0.40	2/5 0.40	n/a
Males	2/4 0.50	0/4 0	n/a
Late Urbanization			
Females	1/7 0.14	3/7 0.43	3/7 0.43
Males	0/4 0	2/4 0.50	1/4 0.25
Time Period	**Right Maxillary M2**	**Right Maxillary M2**	**Right Maxillary M2**
	Prevalence of Score of 5	**Prevalence of Score of 7**	**Prevalence of Score of 8**
Pre-Urbanization			
Females	1/5 0.20	n/a	n/a
Males	1/3 0.33	n/a	n/a

Table B.179. Temporal comparison of sex differences in dental wear (right maxillary M2) severity (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Continued

Table B.179 continued			
Early Urbanization			
Females	0/5 0	0/5 0	1/5 0.20
Males	1/4 0.25	1/4 0.25	0/4 0
Late Urbanization			
Females	0/7 0	n/a	n/a
Males	1/4 0.25	n/a	n/a

p-values (Fisher's exact) Pre-Urbanization	**4**	**5**	**-**	**-**
3	0.3333	1.0000	-	-
4	-	1.0000	-	-
p-values (Fisher's exact) Early Urbanization	**3**	**5**	**7**	**8**
2	0.4667	1.0000	1.0000	1.0000
3	-	0.3333	0.3333	n/a
5	-	-	n/a	1.0000
7	-	-	-	1.0000
p-values (Fisher's exact) Late Urbanization	**3**	**4**	**5**	**-**
2	1.0000	1.0000	1.0000	-
3	-	1.0000	1.0000	-
4	-	-	0.4000	-

Time Period	**Left Mandibular M1**	**Left Mandibular M1**
	Prevalence of Score of 4	**Prevalence of Score of 6**
Pre-Urbanization	0/1	1/1 1.00
Early Urbanization	n/a	n/a
Late Urbanization	2/2 1.00	0/2 0

p-values (Fisher's exact)	**6**
4	
pre vs. early	n/a
pre vs. late	n/a
early vs. late	0.3333

Table B.180. Temporal comparison of dental wear (left mandibular M1) severity in young adult (YA) females (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Left Mandibular M1	Left Mandibular M2	Left Mandibular M2
	Prevalence of Score of 3	Prevalence of Score of 4	Prevalence of Score of 6
Pre-Urbanization	0/1 0	1/1 1.00	0/1 0
Early Urbanization	2/2 1.00	0/2 0	0/2 0
Late Urbanization	0/1 0	0/1 0	1/1 1.00
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)	n/a	n/a	n/a

p-values (Fisher's exact)	4	6
3		
pre vs. early	0.3333	n/a
pre vs. late	n/a	n/a
early vs. late	n/a	0.3333
4		
pre vs. early	-	n/a
pre vs. late	-	1.0000
early vs. late	-	n/a

Table B.181. Temporal comparison of dental wear (left mandibular M2) severity in young adult (YA) females (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Right Mandibular M1	Right Mandibular M1	Right Mandibular M1
	Prevalence of Score of 4	**Prevalence of Score of 6**	**Prevalence of Score of 7**
Pre-Urbanization	0/1 0	1/1 1.00	0/1 0
Early Urbanization	2/2 1.00	0/2 0	0/2 0
Late Urbanization	0/1 0	0/1 0	1/1 1.00
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)	n/a	n/a	n/a

p-values (Fisher's exact)	4	5
3		
pre vs. early	0.3333	n/a
pre vs. late	n/a	n/a
early vs. late	n/a	0.3333
4		
pre vs. early	-	n/a
pre vs. late	-	1.0000
early vs. late	-	n/a

Table B.182. Temporal comparison of dental wear (right mandibular M1) severity in young adult (YA) females (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Right Mandibular M2	Right Mandibular M2	Right Mandibular M2
	Prevalence of Score of 2	Prevalence of Score of 3	Prevalence of Score of 4
Pre-Urbanization	0/1 0	0/1 0	1/1 1.00
Early Urbanization	1/3 0.33	1/3 0.33	0/3 0
Late Urbanization	0/1 0	0/1 0	0/1 0

Time Period	Right Mandibular M2	Right Mandibular M2
	Prevalence of Score of 5	Prevalence of Score of 6
Pre-Urbanization	0/1 0	0/1 0
Early Urbanization	1/3 0.33	0/3 0
Late Urbanization	0/1 0	1/1 1.00

p-values (Fisher's exact)	3	4	5	6
2				
pre vs. early	n/a	1.0000	n/a	n/a
pre vs. late	n/a	n/a	n/a	n/a
early vs. late	n/a	n/a	n/a	1.0000
3				
pre vs. early	-	1.0000	n/a	n/a
pre vs. late	-	n/a	n/a	n/a
early vs. late	-	n/a	n/a	1.0000
4				
pre vs. early	-	-	1.0000	n/a
pre vs. late	-	-	n/a	1.0000
early vs. late	-	-	n/a	n/a

Table B.183. Temporal comparison of dental wear (right mandibular M2) severity in young adult (YA) females (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Continued

Table B.183 continued				
p-values (Fisher's exact)	**3**	**4**	**5**	**6**
5				
pre vs. early	-	-	-	n/a
pre vs. late	-	-	-	n/a
early vs. late	-	-	-	1.0000

Time Period	Left Maxillary M1	Left Maxillary M1	Left Maxillary M1
	Prevalence of Score of 3	Prevalence of Score of 4	Prevalence of Score of 5
Pre-Urbanization	0/1 0	1/1 1.00	0/1 0
Early Urbanization	1/3 0.33	1/3 0.33	1/3 0.33
Late Urbanization	0/1 0	0/1 0	1/1 1.00

p-values (Fisher's exact)	4	5
3		
pre vs. early	1.0000	n/a
pre vs. late	n/a	n/a
early vs. late	n/a	1.0000
4		
pre vs. early	-	1.0000
pre vs. late	-	1.0000
early vs. late	-	1.0000

Table B.184. Temporal comparison of dental wear (left maxillary M1) severity in young adult (YA) females (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Left Maxillary M2	Left Maxillary M2
	Prevalence of Score of 3	**Prevalence of Score of 4**
Pre-Urbanization	1/1 1.00	0/1 0
Early Urbanization	1/1 1.00	0/1 0
Late Urbanization	0/1 0	1/1 1.00

p-values (Fisher's exact)	**4**
3	
pre vs. early	n/a
pre vs. late	1.0000
early vs. late	1.0000

Table B.185. Temporal comparison of dental wear (left maxillary M2) severity in young adult (YA) females (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Right Maxillary M1	Right Maxillary M1	Right Maxillary M1	Right Maxillary M1
	Prevalence of Score of 3	**Prevalence of Score of 4**	**Prevalence of Score of 5**	**Prevalence of Score of 6**
Pre-Urbanization	0/1 0	1/1 1.00	0/1 0	0/1 0
Early Urbanization	1/3 0.33	1/3 0.33	1/3 0.33	0/3 0
Late Urbanization	0/1 0	0/1 0	0/1 0	1/1 1.00

p-values (Fisher's exact)	4	5	6
3			
pre vs. early	1.0000	n/a	n/a
pre vs. late	n/a	n/a	n/a
early vs. late	n/a	n/a	1.0000
4			
pre vs. early	-	1.0000	n/a
pre vs. late	-	n/a	1.0000
early vs. late	-	n/a	1.0000
5			
pre vs. early	-	-	n/a
pre vs. late	-	-	n/a
early vs. late	-	-	1.0000

Table B.186. Temporal comparison of dental wear (right maxillary M1) severity in young adult (YA) females (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Right Maxillary M2	Right Maxillary M2
	Prevalence of Score of 3	Prevalence of Score of 4
Pre-Urbanization	0/1 0	1/1 1.00
Early Urbanization	2/3 0.67	1/3 0.33
Late Urbanization	0/1 0	1/1 1.00

p-values (Fisher's exact)	4
3	
pre vs. early	1.0000
pre vs. late	n/a
early vs. late	1.0000

Table B.187. Temporal comparison of dental wear (right maxillary M2) severity in young adult (YA) females (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Left Mandibular M1	Left Mandibular M1	Left Mandibular M1
	Prevalence of Score of 4	**Prevalence of Score of 6**	**Prevalence of Score of 8**
Pre-Urbanization	0/1 0	1/1 1.00	0/1 0
Early Urbanization	1/2 0.50	0/2 0	1/2 0.50
Late Urbanization	0/1 0	1/1 1.00	0/1 0

p-values (Fisher's exact)	4	6
3		
pre vs. early	1.0000	n/a
pre vs. late	n/a	n/a
early vs. late	1.0000	n/a
4		
pre vs. early	-	1.0000
pre vs. late	-	n/a
early vs. late	-	1.0000

Table B.188. Temporal comparison of dental wear (left mandibular M1) severity in middle adult (MA) females (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Left Mandibular M2
	Prevalence of Score of 3
Pre-Urbanization	n/a
Early Urbanization	1/1 1.00
Late Urbanization	n/a
p-value (chi-square)	n/a
p-value (Fisher's exact)	n/a

Table B.189. Temporal comparison of dental wear (left mandibular M2) severity in middle adult (MA) females (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Right Mandibular M1	Right Mandibular M1	Right Mandibular M1	Right Mandibular M1
	Prevalence of Score of 4	**Prevalence of Score of 5**	**Prevalence of Score of 6**	**Prevalence of Score of 8**
Pre-Urbanization	0/1 0	1/1 1.00	0/1 0	0/1 0
Early Urbanization	1/2 0.50	0/2 0	0/2 0	1/2 0.50
Late Urbanization	0/1 0	0/1 0	1/1 1.00	0/1 0

p-values (Fisher's exact)	5	6	8
4			
pre vs. early	1.0000	n/a	n/a
pre vs. late	n/a	n/a	n/a
early vs. late	n/a	1.0000	n/a
5			
pre vs. early	-	n/a	1.0000
pre vs. late	-	1.0000	n/a
early vs. late	-	n/a	n/a
6			
pre vs. early	-	-	n/a
pre vs. late	-	-	n/a
early vs. late	-	-	1.0000

Table B.190. Temporal comparison of dental wear (right mandibular M1) severity in middle adult (MA) females (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Right Mandibular M2	Right Mandibular M2	Right Mandibular M2
	Prevalence of Score of 3	Prevalence of Score of 4	Prevalence of Score of 7
Pre-Urbanization	0/1 0	1/1 1.00	0/1 0
Early Urbanization	1/3 0.33	0/3 0	2/3 0.67
Late Urbanization	1/2 0.50	1/2 0.50	0/2 0

p-values (Fisher's exact)	4	7
3		
pre vs. early	1.0000	n/a
pre vs. late	1.0000	n/a
early vs. late	1.0000	1.0000
4		
pre vs. early	-	0.3333
pre vs. late	-	n/a
early vs. late	-	0.3333

Table B.191. Temporal comparison of dental wear (right mandibular M2) severity in middle adult (MA) females (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Left Maxillary M1	Left Maxillary M1	Left Maxillary M1
	Prevalence of Score of 3	**Prevalence of Score of 5**	**Prevalence of Score of 8**
Pre-Urbanization	1/1 1.00	0/1 0	0/1 0
Early Urbanization	0/2 0	0/2 0	2/2 1.00
Late Urbanization	0/1 0	1/1 1.00	0/1 0

p-values (Fisher's exact)	5	8
3		
pre vs. early	n/a	0.3333
pre vs. late	1.0000	n/a
early vs. late	n/a	n/a
5		
pre vs. early	-	n/a
pre vs. late	-	n/a
early vs. late	-	0.3333

Table B.192. Temporal comparison of dental wear (left maxillary M1) severity in middle adult (MA) females (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Left Maxillary M2
	Prevalence of Score of 3
Pre-Urbanization	n/a
Early Urbanization	n/a
Late Urbanization	1/1 1.00
p-value (chi-square)	n/a
p-value (Fisher's exact)	n/a

Table B.193. Temporal comparison of dental wear (left maxillary M2) severity in middle adult (MA) females (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Right Maxillary M1	Right Maxillary M1	Right Maxillary M1
	Prevalence of Score of 6	Prevalence of Score of 7	Prevalence of Score of 8
Pre-Urbanization	0/1 0	0/1 0	1/1 1.00
Early Urbanization	0/2 0	0/2 0	2/2 1.00
Late Urbanization	1/2 0.50	1/2 0.50	0/2 0

p-values (Fisher's exact)	7	8
6		
pre vs. early	n/a	n/a
pre vs. late	n/a	1.0000
early vs. late	n/a	0.3333
7		
pre vs. early	-	n/a
pre vs. late	-	1.0000
early vs. late	-	0.3333

Table B.194. Temporal comparison of dental wear (right maxillary M1) severity in middle adult (MA) females (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Right Maxillary M2	Right Maxillary M2	Right Maxillary M2
	Prevalence of Score of 4	**Prevalence of Score of 5**	**Prevalence of Score of 8**
Pre-Urbanization	0/1 0	1/1 1.00	0/1 0
Early Urbanization	0/1 0	0/1 0	1/1 1.00
Late Urbanization	2/2 1.00	0/2 0	0/2 0

p-values (Fisher's exact)	5	8
4		
pre vs. early	n/a	n/a
pre vs. late	0.3333	n/a
early vs. late	n/a	0.3333
5		
pre vs. early	-	1.0000
pre vs. late	-	n/a
early vs. late	-	n/a

Table B.195. Temporal comparison of dental wear (right maxillary M2) severity in middle adult (MA) females (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	**Left Maxillary M2**	**Left Maxillary M2**
	Prevalence of Score of 5	**Prevalence of Score of 8**
Pre-Urbanization	0/1 0	1/1 1.00
Early Urbanization	1/1 1.00	0/1 0
Late Urbanization	n/a	n/a

p-values (Fisher's exact)	**8**
5	
pre vs. early	1.0000
pre vs. late	n/a
early vs. late	n/a

Table B.196. Temporal comparison of dental wear (left maxillary M2) severity in old adult (OA) females (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Left Mandibular M1	Left Mandibular M2	Right Mandibular M2	Right Mandibular M2
	None	Prevalence of Score of 6	None	None
Pre-Urbanization	-	n/a	-	-
Early Urbanization	-	1/1 1.00	-	-
Late Urbanization	-	n/a	-	-
p-value (chi-square)	-	n/a	-	-
p-value (Fisher's exact)	-	n/a	-	-

Time Period	Left Maxillary M1	Right Maxillary M1	Right Maxillary M2
	Prevalence of Score of 6	Prevalence of Score of 6	None
Pre-Urbanization	n/a	n/a	-
Early Urbanization	1/1 1.00	1/1 1.00	-
Late Urbanization	n/a	n/a	-
p-value (chi-square)	n/a	n/a	-
p-value (Fisher's exact)	n/a	n/a	-

Table B.197. Temporal comparison of dental wear (left maxillary M1) severity in old adult (OA) females (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Left Mandibular M1	Left Mandibular M1
	Prevalence of Score of 4	Prevalence of Score of 5
Pre-Urbanization	1/1 1.00	0/1 0
Early Urbanization	0/1 0	1/1 1.00
Late Urbanization	1/1 1.00	0/1 0

p-values (Fisher's exact)	5
4	
pre vs. early	1.0000
pre vs. late	n/a
early vs. late	1.0000

Table B.198. Temporal comparison of dental wear (left mandibular M1) severity in young adult (YA) males (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Left Mandibular M2	Left Mandibular M2
	Prevalence of Score of 3	**Prevalence of Score of 6**
Pre-Urbanization	n/a	n/a
Early Urbanization	1/2 0.50	1/2 0.50
Late Urbanization	1/1 1.00	0/1 0

p-values (Fisher's exact)	**6**
3	
pre vs. early	n/a
pre vs. late	n/a
early vs. late	1.0000

Table B.199. Temporal comparison of dental wear (left mandibular M2) severity in young adult (YA) males (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Right Mandibular M1	Right Mandibular M1
	Prevalence of Score of 4	**Prevalence of Score of 6**
Pre-Urbanization	n/a	n/a
Early Urbanization	0/1 0	1/1 1.00
Late Urbanization	1/1 1.00	0/1 0

p-values (Fisher's exact)	6
4	
pre vs. early	n/a
pre vs. late	n/a
early vs. late	1.0000

Table B.200. Temporal comparison of dental wear (right mandibular M1) severity in young adult (YA) males (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Right Mandibular M2	Right Mandibular M2	Right Mandibular M2
	Prevalence of Score of 3	Prevalence of Score of 4	Prevalence of Score of 5
Pre-Urbanization	0/1 0	1/1 1.00	0/1 0
Early Urbanization	0/2 0	1/2 0.50	1/2 0.50
Late Urbanization	1/1 1.00	0/1 0	0/1 0

p-values (Fisher's exact)	4	5
3		
pre vs. early	n/a	n/a
pre vs. late	1.0000	n/a
early vs. late	1.0000	1.0000
4		
pre vs. early	-	1.0000
pre vs. late	-	n/a
early vs. late	-	n/a

Table B.201. Temporal comparison of dental wear (right mandibular M2) severity in young adult (YA) males (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Left Maxillary M1
	Prevalence of Score of 4
Pre-Urbanization	1/1 1.00
Early Urbanization	n/a
Late Urbanization	2/2 1.00
p-value (chi-square)	n/a
p-value (Fisher's exact)	n/a

Table B.202. Temporal comparison of dental wear (left maxillary M1) severity in young adult (YA) males (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Left Maxillary M2	Left Maxillary M2
	Prevalence of Score of 3	Prevalence of Score of 6
Pre-Urbanization	1/1 1.00	0/1 0
Early Urbanization	0/1 0	1/1 1.00
Late Urbanization	2/2 1.00	0/2 0

p-values (Fisher's exact)	6
3	
pre vs. early	1.0000
pre vs. late	n/a
early vs. late	0.3333

Table B.203. Temporal comparison of dental wear (left maxillary M2) severity in young adult (YA) males (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Right Maxillary M1	Right Maxillary M1	Right Maxillary M1
	Prevalence of Score of 4	Prevalence of Score of 5	Prevalence of Score of 8
Pre-Urbanization	0/1 0	1/1 1.00	0/1 0
Early Urbanization	0/1 0	0/1 0	1/1 1.00
Late Urbanization	2/2 1.00	0/2 0	0/2 0

p-values (Fisher's exact)	5	8
4		
pre vs. early	n/a	n/a
pre vs. late	0.3333	n/a
early vs. late	n/a	0.3333
5		
pre vs. early	-	1.0000
pre vs. late	-	n/a
early vs. late	-	n/a

Table B.204. Temporal comparison of dental wear (right maxillary M1) severity in young adult (YA) males (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Right Maxillary M2
	Prevalence of Score of 3
Pre-Urbanization	1/1 1.00
Early Urbanization	n/a
Late Urbanization	2/2 1.00
p-value (chi-square)	n/a
p-value (Fisher's exact)	n/a

Table B.205. Temporal comparison of dental wear (right maxillary M2) severity in young adult (YA) males (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Left Mandibular M1	Left Mandibular M1	Left Mandibular M1
	Prevalence of Score of 5	**Prevalence of Score of 6**	**Prevalence of Score of 7**
Pre-Urbanization	1/3 0.33	2/3 0.67	0/3 0
Early Urbanization	0/2 0	0/2 0	2/2 1.00
Late Urbanization	2/2 1.00	0/2 0	0/2 0

p-values (Fisher's exact)	6	7
5		
pre vs. early	n/a	0.3333
pre vs. late	0.4000	n/a
early vs. late	n/a	0.3333
6		
pre vs. early	-	0.3333
pre vs. late	-	n/a
early vs. late	-	n/a

Table B.206. Temporal comparison of dental wear (left mandibular M1) severity in middle adult (MA) males (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Left Mandibular M2	Left Mandibular M2	Left Mandibular M2	Left Mandibular M2
	Prevalence of Score of 4	**Prevalence of Score of 5**	**Prevalence of Score of 6**	**Prevalence of Score of 7**
Pre-Urbanization	1/2 0.50	1/2 0.50	0/2 0	0/2 0
Early Urbanization	0/3 0	1/3 0.33	1/3 0.33	1/3 0.33
Late Urbanization	2/2 1.00	0/2 0	0/2 0	0/2 0

p-values (Fisher's exact)	5	6	7
4			
pre vs. early	1.0000	1.0000	1.0000
pre vs. late	1.0000	n/a	n/a
early vs. late	0.3333	0.3333	0.3333
5			
pre vs. early	-	1.0000	1.0000
pre vs. late	-	n/a	n/a
early vs. late	-	n/a	n/a
6			
pre vs. early	-	-	n/a
pre vs. late	-	-	n/a
early vs. late	-	-	n/a

Table B.207. Temporal comparison of dental wear (left mandibular M2) severity in middle adult (MA) males (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Right Mandibular M1	Right Mandibular M1
	Prevalence of Score of 6	**Prevalence of Score of 7**
Pre-Urbanization	0/1 0	0/1 0
Early Urbanization	0/2 0	1/2 0.50
Late Urbanization	1/1 1.00	0/1 0

p-values (Fisher's exact)	7
6	
pre vs. early	0.3333
pre vs. late	n/a
early vs. late	n/a

Table B.208. Temporal comparison of dental wear (right mandibular M1) severity in middle adult (MA) males (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Right Mandibular M2	Right Mandibular M2	Right Mandibular M2
	Prevalence of Score of 3	Prevalence of Score of 5	Prevalence of Score of 8
Pre-Urbanization	0/3 0	3/3 1.00	0/3 0
Early Urbanization	0/2 0	0/2 0	2/2 1.00
Late Urbanization	1/2 0.50	0/2 0	1/2 0.50

p-values (Fisher's exact)	5	8
3		
pre vs. early	n/a	n/a
pre vs. late	0.2500	n/a
early vs. late	n/a	1.0000
5		
pre vs. early	-	1.0000
pre vs. late	-	0.2500
early vs. late	-	n/a

Table B.209. Temporal comparison of dental wear (right mandibular M2) severity in middle adult (MA) males (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Left Maxillary M1	Left Maxillary M1	Left Maxillary M1	Left Maxillary M1
	Prevalence of Score of 5	Prevalence of Score of 6	Prevalence of Score of 7	Prevalence of Score of 8
Pre-Urbanization	0/2 0	1/2 0.50	0/2 0	1/2 0.50
Early Urbanization	0/2 0	0/2 0	2/2 1.00	0/2 0
Late Urbanization	1/2 0.50	0/2 0	0/2 0	1/2 0.50

p-values (Fisher's exact)	6	7	8
5			
pre vs. early	n/a	n/a	n/a
pre vs. late	1.0000	n/a	1.0000
early vs. late	n/a	0.3333	n/a
6			
pre vs. early	-	0.3333	n/a
pre vs. late	-	n/a	1.0000
early vs. late	-	n/a	n/a
7			
pre vs. early	-	-	0.3333
pre vs. late	-	-	n/a
early vs. late	-	-	0.3333

Table B.210. Temporal comparison of dental wear (left maxillary M1) severity in middle adult (MA) males (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Left Maxillary M2	Left Maxillary M2
	Prevalence of Score of 4	**Prevalence of Score of 5**
Pre-Urbanization	0/1 0	1/1 1.00
Early Urbanization	0/1 0	1/1 1.00
Late Urbanization	1/2 0.50	1/2 0.50

p-values (Fisher's exact)	**5**
4	
pre vs. early	n/a
pre vs. late	1.0000
early vs. late	1.0000

Table B.211. Temporal comparison of dental wear (left maxillary M2) severity in middle adult (MA) males (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Right Maxillary M1	Right Maxillary M1	Right Maxillary M1
	Prevalence of Score of 5	**Prevalence of Score of 6**	**Prevalence of Score of 8**
Pre-Urbanization	2/3 0.67	0/3 0	1/3 0.33
Early Urbanization	1/1 1.00	0/1 0	0/1 0
Late Urbanization	1/2 0.50	1/2 0.50	0/2 0

p-values (Fisher's exact)	6	8
5		
pre vs. early	n/a	1.0000
pre vs. late	1.0000	1.0000
early vs. late	1.0000	n/a
6		
pre vs. early	-	n/a
pre vs. late	-	1.0000
early vs. late	-	n/a

Table B.212. Temporal comparison of dental wear (right maxillary M1) severity in middle adult (MA) males (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Right Maxillary M2	Right Maxillary M2	Right Maxillary M2
	Prevalence of Score of 2	Prevalence of Score of 4	Prevalence of Score of 5
Pre-Urbanization	0/1 0	1/1 1.00	0/1 0
Early Urbanization	1/1 1.00	0/1 0	0/1 0
Late Urbanization	0/2 0	1/2 0.50	1/2 0.50

p-values (Fisher's exact)	4	5
2		
pre vs. early	1.0000	n/a
pre vs. late	n/a	n/a
early vs. late	1.0000	1.0000
4		
pre vs. early	-	n/a
pre vs. late	-	1.0000
early vs. late	-	n/a

Table B.213. Temporal comparison of dental wear (right maxillary M2) severity in middle adult (MA) males (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Left Mandibular M1	Left Mandibular M1
	Prevalence of Score of 4	**Prevalence of Score of 7**
Pre-Urbanization	1/1 1.00	1/1 1.00
Early Urbanization	n/a	n/a
Late Urbanization	n/a	n/a
p-value (chi-square)	n/a	n/a
p-value (Fisher's exact)	n/a	n/a

Table B.214. Temporal comparison of dental wear (left mandibular M1) severity in old adult (OA) males (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Right Mandibular M1	Right Mandibular M1
	Prevalence of Score of 5	**Prevalence of Score of 7**
Pre-Urbanization	1/1 1.00	1/1 1.00
Early Urbanization	n/a	n/a
Late Urbanization	n/a	n/a
p-value (chi-square)	n/a	n/a
p-value (Fisher's exact)	n/a	n/a

Table B.215. Temporal comparison of dental wear (right mandibular M1) severity in old adult (OA) males (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Right Mandibular M2	Right Mandibular M2
	Prevalence of Score of 4	Prevalence of Score of 6
Pre-Urbanization	1/1 1.00	1/1 1.00
Early Urbanization	n/a	n/a
Late Urbanization	n/a	n/a
p-value (chi-square)	n/a	n/a
p-value (Fisher's exact)	n/a	n/a

Table B.216. Temporal comparison of dental wear (right mandibular M2) severity in old adult (OA) males (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	**Left Maxillary M1**	**Left Maxillary M1**
	Prevalence of Score of 5	**Prevalence of Score of 7**
Pre-Urbanization	1/1 1.00	1/1 1.00
Early Urbanization	n/a	n/a
Late Urbanization	n/a	n/a
p-value (chi-square)	n/a	n/a
p-value (Fisher's exact)	n/a	n/a

Table B.217. Temporal comparison of dental wear (right mandibular M2) severity in old adult (OA) males (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	**Right Maxillary M1**	**Right Maxillary M1**
	Prevalence of Score of 5	**Prevalence of Score of 8**
Pre-Urbanization	1/1 1.00	1/1 1.00
Early Urbanization	n/a	n/a
Late Urbanization	n/a	n/a
p-value (chi-square)	n/a	n/a
p-value (Fisher's exact)	n/a	n/a

Table B.218. Temporal comparison of dental wear (right maxillary M1) severity in old adult (OA) males (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	Left Mandibular M2	Left Maxillary M2	Right Maxillary M2
	Prevalence of Score of 6	**None**	**Prevalence of Score of 5**
Pre-Urbanization	1/1 1.00	-	1/1 1.00
Early Urbanization	n/a	-	n/a
Late Urbanization	n/a	-	n/a
p-value (chi-square)	n/a	-	n/a
p-value (Fisher's exact)	n/a	-	n/a

Table B.219. Temporal comparison of dental wear (right maxillary M1) severity in old adult (OA) males (N-individuals with severity level/N-total individuals with wear; prevalence rate)

Time Period	**DJD**
Pre-Urbanization	11/28 0.39
Early Urbanization	16/34 0.47
Late Urbanization	16/28 0.57
p-value (chi-square)	0.4065
p-value (Fisher's exact)	n/a

Table B.220. Temporal comparison of prevalence of DJD in adults (N-affected/N-total; prevalence rate)

Time Period	TMJ	Left Shoulder	Right Shoulder	Left Elbow
Pre-Urbanization	1/20 0.05	4/13 0.31	2/13 0.15	1/12 0.08
Early Urbanization	1/20 0.05	2/17 0.12	2/15 0.13	0/18 0
Late Urbanization	3/20 0.15	2/13 0.15	3/10 0.30	4/13 0.31
p-value (chi-square)	n/a	n/a	n/a	n/a
p-value (Fisher's exact)				
pre vs. early	1.0000	0.3598	1.0000	0.4000
pre vs. late	0.6050	0.6447	0.6175	0.3217
early vs. late	0.6050	1.0000	0.3577	0.0227*

Time Period	Right Elbow	Left Wrist	Right Wrist
Pre-Urbanization	4/15 0.27	0/6 0	1/10 0.10
Early Urbanization	3/19 0.16	0/16 0	0/17 0
Late Urbanization	4/11 0.36	3/10 0.30	1/10 0.10
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)			
pre vs. early	0.6722	n/a	0.3704
pre vs. late	0.6828	0.2500	1.0000
early vs. late	0.3717	0.0462*	0.3704

Table B.221. Temporal comparison of prevalence of DJD of TMJ and upper limb joints in adults (*significant, p≤0.05) (N-affected/N-total; prevalence rate)

Time Period	Left Hip	Right Hip	Left Knee
Pre-Urbanization	6/16 0.38	5/18 0.28	1/14 0.07
Early Urbanization	0/20 0	0/22 0	0/20 0
Late Urbanization	2/17 0.12	3/16 0.19	1/17 0.06
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)			
pre vs. early	0.0041*	0.013*	0.4118
pre vs. late	0.1175	0.6933	1.0000
early vs. late	0.2042	0.0664	0.4595
Time Period	**Right Knee**	**Left Ankle**	**Right Ankle**
Pre-Urbanization	1/16 0.06	2/12 0.17	1/15 0.07
Early Urbanization	1/24 0.04	2/24 0.08	0/22 0
Late Urbanization	1/17 0.06	0/15 0	0/15 0
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)			
pre vs. early	1.0000	0.5877	0.4054
pre vs. late	1.0000	0.1880	1.0000
early vs. late	1.0000	0.5142	n/a

Table B.222. Temporal comparison of prevalence of DJD of lower limb joints in adults (*significant, p≤0.05) (N-affected/N-total; prevalence rate)

Time Period	**Cervical Vertebrae**	**Thoracic Vertebrae**	**Lumbar Vertebrae**
Pre-Urbanization	3/12 0.25	5/12 0.42	7/12 0.58
Early Urbanization	4/15 0.21	10/25 0.40	12/22 0.55
Late Urbanization	3/16 0.19	5/15 0.33	8/13 0.62
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)			
pre vs. early	1.0000	1.0000	1.0000
pre vs. late	1.0000	0.7063	1.0000
early vs. late	1.0000	0.7458	0.7372

Table B.223. Temporal comparison of prevalence of DJD vertebrae in adults (N-affected/N-total; prevalence rate)

Time Period	DJD
Pre-Urbanization	5/10 0.50
Early Urbanization	6/14 0.43
Late Urbanization	7/13 0.54
p-value (chi-square)	0.8454
p-value (Fisher's exact)	n/a

Table B.224. Temporal comparison of prevalence of DJD in adult females (N-affected/N-total; prevalence rate)

Time Period	TMJ	Left Shoulder	Right Shoulder	Left Elbow
Pre-Urbanization	0/8 0	0/5 0	1/5 0.20	1/3 0.33
Early Urbanization	0/11 0	1/7 0.14	1/7 0.14	0/9 0
Late Urbanization	2/12 0.17	1/7 0.14	1/6 0.17	4/8 0.50
p-value (chi-square)	n/a	n/a	n/a	n/a
p-value (Fisher's exact)				
pre vs. early	n/a	1.0000	1.0000	0.2500
pre vs. late	0.4947	1.0000	1.0000	1.0000
early vs. late	0.4783	1.0000	1.0000	0.0294*

Time Period	Right Elbow	Left Wrist	Right Wrist
Pre-Urbanization	3/6 0.50	0/1 0	1/1 1.00
Early Urbanization	1/10 0.10	0/10 0	0/10 0
Late Urbanization	2/6 0.33	3/7 0.43	1/7 0.14
p-value (chi-square)	n/a	n/a	n/a
p-value Fisher's exact)			
pre vs. early	0.1181	n/a	0.0909
pre vs. late	1.0000	1.0000	0.2500
early vs. late	0.5179	0.0515	0.4118

Table B.225. Temporal comparison of prevalence of DJD of TMJ and upper limb joints in adult females (*significant, p≤0.05) (N-affected/N-total; prevalence rate)

Time Period	Left Hip	Right Hip	Left Knee
Pre-Urbanization	2/6 0.33	3/8 0.38	1/5 0.20
Early Urbanization	0/11 0	0/12 0	0/10 0
Late Urbanization	1/9 0.11	2/8 0.25	1/9 0.11
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)			
pre vs. early	0.1103	0.0491*	0.3333
pre vs. late	0.5253	1.0000	1.0000
early vs. late	0.4500	0.1474	0.4737
Time Period	**Right Knee**	**Left Ankle**	**Right Ankle**
Pre-Urbanization	1/5 0.20	1/4 0.25	1/5 0.20
Early Urbanization	0/10 0	1/10 0.10	0/10 0
Late Urbanization	1/8 0.13	0/8 0	0/8 0
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)			
pre vs. early	0.3333	0.5055	0.3333
pre vs. late	1.0000	0.3333	0.3846
early vs. late	0.4444	1.0000	n/a

Table B.226. Temporal comparison of prevalence of DJD of lower limb joints in adult females (*significant, $p \leq 0.05$) (N-affected/N-total; prevalence rate)

Time Period	**Cervical Vertebrae**	**Thoracic Vertebrae**	**Lumbar Vertebrae**
Pre-Urbanization	1/4 0.25	2/5 0.40	4/6 0.67
Early Urbanization	2/12 0.17	5/14 0.36	5/12 0.42
Late Urbanization	3/10 0.30	3/9 0.33	2/6 0.33
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)			
pre vs. early	1.0000	1.0000	0.6199
pre vs. late	1.0000	1.0000	0.5671
early vs. late	0.6241	1.0000	1.0000

Table B.227. Temporal comparison of prevalence of DJD of vertebrae in adult females (N-affected/N-total; prevalence rate)

Time Period	**DJD**
Pre-Urbanization	6/11 0.55
Early Urbanization	8/9 0.89
Late Urbanization	6/7 0.86
p-value (chi-square)	n/a
p-value (Fisher's exact)	
pre vs. early	0.1571
pre vs. late	0.3156
early vs. late	1.0000

Table B.228. Temporal comparison of prevalence of DJD in adult males (N-affected/N-total; prevalence rate)

Time Period	TMJ	Left Shoulder	Right Shoulder	Left Elbow
Pre-Urbanization	1/9 0.11	4/7 0.57	1/7 0.14	-
Early Urbanization	1/7 0.14	1/7 0.14	1/6 0.17	-
Late Urbanization	0/6 0	1/4 0.25	2/3 0.67	-
p-value (chi-square)	n/a	n/a	n/a	-
p-value (Fisher's exact)				-
pre vs. early	1.0000	0.2657	1.0000	-
pre vs. late	1.0000	0.5455	0.1813	-
early vs. late	1.0000	1.0000	0.2262	-

Time Period	Right Elbow	Left Wrist	Right Wrist
Pre-Urbanization	1/8 0.13	-	-
Early Urbanization	2/6 0.33	-	-
Late Urbanization	1/4 0.25	-	-
p-value (chi-square)	n/a	-	-
p-value (Fisher's exact)		-	-
pre vs. early	0.5385	-	-
pre vs. late	1.0000	-	-
early vs. late	1.0000	-	-

Table B.229. Temporal comparison of prevalence of DJD of TMJ and upper limb joints in adult males (N-affected/N-total; prevalence rate)

Time Period	Left Hip	Right Hip	Left Knee
Pre-Urbanization	4/8 0.50	2/7 0.29	-
Early Urbanization	0/5 0	0/5 0	-
Late Urbanization	1/5 0.20	0/6 0	-
p-value (chi-square)	n/a	n/a	-
p-value (Fisher's exact)			-
pre vs. early	0.1049	0.4697	-
pre vs. late	0.5649	0.4615	-
early vs. late	1.0000	n/a	-
Time Period	**Right Knee**	**Left Ankle**	**Right Ankle**
Pre-Urbanization	-	1/5 0.20	-
Early Urbanization	-	0/5 0	-
Late Urbanization	-	0/4 0	-
p-value (chi-square)	-	n/a	-
p-value (Fisher's exact)	-		-
pre vs. early	-	1.0000	-
pre vs. late	-	1.0000	-
early vs. late	-	n/a	-

Table B.230. Temporal comparison of prevalence of DJD of lower limb joints in adult males (N-affected/N-total; prevalence rate)

Time Period	**Cervical Vertebrae**	**Thoracic Vertebrae**	**Lumbar Vertebrae**
Pre-Urbanization	2/6 0.33	3/6 0.50	3/6 0.50
Early Urbanization	2/6 0.33	4/8 0.50	5/6 0.83
Late Urbanization	0/4 0	2/4 0.50	3/4 0.75
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)			
pre vs. early	1.0000	1.0000	0.5455
pre vs. late	0.4667	1.0000	0.5714
early vs. late	0.4667	1.0000	1.0000

Table B.231. Temporal comparison of prevalence of DJD of vertebrae in adult males (N-affected/N-total; prevalence rate)

Time Period	**DJD**
Pre-Urbanization	
Females	5/10 0.50
Males	6/11 0.55
p-value (Fisher's exact)	1.0000
Early Urbanization	
Females	6/14 0.43
Males	8/9 0.89
p-value (Fisher's exact)	0.0397*
Late Urbanization	
Females	7/13 0.54
Males	6/7 0.86
p-value (Fisher's exact)	0.3285

Table B.232. Temporal comparison of sex differences in prevalence of DJD (*significant, p≤0.05) (N-affected/N-total; prevalence rate)

Time Period	TMJ	Left Shoulder	Right Shoulder	Left Elbow
Pre-Urbanization				
Females	0/8 0	0/5 0	1/5 0.20	1/3 0.33
Males	1/0 0.11	4/7 0.57	1/7 0.14	0/8 0
p-value (Fisher's exact)	1.0000	0.0808	1.0000	0.2727
Early Urbanization				
Females	0/11	1/7 0.14	1/7 0.14	0/9 0
Males	1/7 0.14	1/7 0.14	1/6 0.17	0/5 0
p-value (Fisher's exact)	0.3889	1.0000	1.0000	n/a
Late Urbanization				
Females	2/12 0.17	1/7 0.14	1/6 0.17	4/8 0.50
Males	0/6 0	1/4 0.25	2/3 0.67	0/3 0
p-value (Fisher's exact)	0.5294	1.0000	0.2262	0.2364

Time Period	Right Elbow	Left Wrist	Right Wrist
Pre-Urbanization			
Females	3/6 0.50	0/1 0	1/1 1.00
Males	1/8 0.13	0/4 0	0/7 0
p-value (Fisher's exact)	0.2448	n/a	0.125

Table B.233. Temporal comparison of sex differences in prevalence of DJD of TMJ and upper limb joints (N-affected/N-total; prevalence rate)

Continued

Table B.233 continued			
Early Urbanization			
Females	1/10 0.10	0/10 0	0/10 0
Males	2/6 0.33	0/5 0	0/5 0
p-value (Fisher's exact)	0.5179	n/a	n/a
Late Urbanization			
Females	2/6 0.33	3/7 0.43	1/7 0.14
Males	1/4 0.25	0/2 0	0/2 0
p-value (Fisher's exact)	1.0000	0.5000	1.0000

Time Period	Left Hip	Right Hip	Left Knee
Pre-Urbanization			
Females	2/6 0.33	3/8 0.38	1/5 0.20
Males	4/8 0.50	2/7 0.29	0/6 0
p-value (Fisher's exact)	0.6270	1.0000	0.4545
Early Urbanization			
Females	0/11 0	0/12 0	0/10 0
Males	0/5 0	0/5 0	0/5 0
p-value (Fisher's exact)	n/a	n/a	n/a
Late Urbanization			
Females	1/9 0.11	2/8 0.25	1/9 0.11
Males	1/5 0.20	0/6 0	0/4 0
p-value (Fisher's exact)	1.0000	0.4725	1.0000
Time Period	**Right Knee**	**Left Ankle**	**Right Ankle**
Pre-Urbanization			
Females	1/5 0.20	1/4 0.25	1/5 0.20
Males	0/6 0	1/5 0.20	0/5 0
p-value (Fisher's exact)	0.4545	1.0000	1.0000

Table B.234. Temporal comparison of sex differences in prevalence of DJD of lower limb joints (N-affected/N-total; prevalence rate)

Continued

Table B.234 continued			
Early Urbanization			
Females	0/10 0	1/10 0.10	0/10 0
Males	0/6 0	0/5 0	0/4 0
p-value (Fisher's exact)	n/a	1.0000	n/a
Late Urbanization			
Females	1/8 0.13	0/8 0	0/8 0
Males	0/6 0	0/4 0	0/4 0
p-value (Fisher's exact)	1.0000	n/a	n/a

Time Period	Cervical Vertebrae	Thoracic Vertebrae	Lumbar Vertebrae
Pre-Urbanization			
Females	1/4 0.25	2/5 0.40	4/6 0.67
Males	2/6 0.33	3/6 0.50	3/6 0.50
p-value (Fisher's exact)	1.0000	1.0000	1.0000
Early Urbanization			
Females	2/12 0.17	5/14 0.36	5/12 0.42
Males	2/6 0.33	4/8 0.50	5/6 0.84
p-value (Fisher's exact)	0.5686	0.6619	0.1516
Late Urbanization			
Females	3/10 0.30	3/9 0.33	2/6 0.33
Males	0/4 0	2/4 0.50	3/4 0.75
p-value (Fisher's exact)	0.5055	1.0000	0.5238

Table B.235. Temporal comparison of sex differences in prevalence of DJD of vertebrae (N-affected/N-total; prevalence rate)

DJD Pattern	Adults	Females	Males
chi-square	35.9739	29.6364	15.5049
degrees of freedom	30	30	18
critical value	43.7729	43.7729	28.8693

Table B.236. Correlation analysis of pattern of DJD among the three temporal samples

Time Period	Right Shoulder	Right Shoulder
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization	1/2 0.50	1/2 0.50
Early Urbanization	2/2 1.00	0/2 0
Late Urbanization	3/3 1.00	0/3 0

p-values (Fisher's exact)	3
2	
pre vs. early	1.0000
pre vs. post	0.4000
early vs. post	n/a

Table B.237. Temporal comparison in the severity of DJD of the right shoulder in adults (N-individuals with severity level/N-total individuals with DJD)

Time Period	Right Elbow	Right Elbow
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization	4/4 1.00	0/4 0
Early Urbanization	3/3 1.00	0/3 0
Late Urbanization	3/4 0.75	1/4 0.25

p-values (Fisher's exact)	3
2	
pre vs. early	n/a
pre vs. post	1.0000
early vs. post	1.0000

Table B.238. Temporal comparison in the severity of DJD of the right elbow in adults (N-individuals with severity level/N-total individuals with DJD)

Time Period	Left Wrist	Left Wrist
	Prevalence of Score of 2	**Prevalence of Score of 3**
Pre-Urbanization	0/0 0	0/0 0
Early Urbanization	0/0 0	0/0 0
Late Urbanization	2/3 0.67	1/3 0.33

p-values (Fisher's exact)	3
2	
pre vs. early	n/a
pre vs. post	n/a
early vs. post	n/a

Table B.239. Temporal comparison in the severity of DJD of the left wrist in adults (N-individuals with severity level/N-total individuals with DJD)

Time Period	Right Wrist	Right Wrist
	Prevalence of Score of 2	**Prevalence of Score of 3**
Pre-Urbanization	0/1 0	1/1 1.00
Early Urbanization	0/0 0	0/0 0
Late Urbanization	1/1 1.00	0/1 0

p-values (Fisher's exact)	3
2	
pre vs. early	n/a
pre vs. post	1.0000
early vs. post	n/a

Table B.240. Temporal comparison in the severity of DJD of the right wrist in adults (N-individuals with severity level/N-total individuals with DJD)

Time Period	Left Hip	Left Hip
	Prevalence of Score of 2	**Prevalence of Score of 3**
Pre-Urbanization	4/6 0.67	2/6 0.33
Early Urbanization	0/0 0	0/0 0
Late Urbanization	2/2 1.00	0/2 0

p-values (Fisher's exact)	3
2	
pre vs. early	n/a
pre vs. post	1.0000
early vs. post	n/a

Table B.241. Temporal comparison in the severity of DJD of the left hip in adults (N-individuals with severity level/N-total individuals with DJD)

Time Period	Right Hip	Right Hip
	Prevalence of Score of 2	**Prevalence of Score of 3**
Pre-Urbanization	4/5 0.80	1/5 0.20
Early Urbanization	0/0 0	0/0 0
Late Urbanization	3/3 1.00	0/3 0

p-values (Fisher's exact)	**3**
2	
pre vs. early	n/a
pre vs. post	1.0000
early vs. post	n/a

Table B.242. Temporal comparison in the severity of DJD of the right hip in adults (N-individuals with severity level/N-total individuals with DJD)

Time Period	**Right Knee**	**Right Knee**
	Prevalence of Score of 2	**Prevalence of Score of 3**
Pre-Urbanization	0/1 0	1/1 1.00
Early Urbanization	1/1 1.00	0/1 0
Late Urbanization	0/1 0	1/1 1.00

p-values (Fisher's exact)	**3**
2	
pre vs. early	1.0000
pre vs. post	n/a
early vs. post	1.0000

Table B.243. Temporal comparison in the severity of DJD of the right knee in adults (N-individuals with severity level/N-total individuals with DJD)

Time Period	Left Ankle	Left Ankle
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization	1/2 0.50	1/2 0.50
Early Urbanization	1/2 0.50	1/2 0.50
Late Urbanization	0/0 0	0/0 0

p-values (Fisher's exact)	3
2	
pre vs. early	1.0000
pre vs. post	n/a
early vs. post	n/a

Table B.244. Temporal comparison in the severity of DJD of the left ankle in adults (N-individuals with severity level/N-total individuals with DJD)

Time Period	Cervical Vertebrae	Cervical Vertebrae
	Prevalence of Score of 2	**Prevalence of Score of 3**
Pre-Urbanization	2/3 0.67	1/3 0.33
Early Urbanization	1/4 0.25	3/4 0.75
Late Urbanization	1/3 0.33	2/3 0.67

p-values (Fisher's exact)	3
2	
pre vs. early	0.4857
pre vs. post	1.0000
early vs. post	1.0000

Table B.245. Temporal comparison in the severity of DJD of the cervical vertebrae in adults (N-individuals with severity level/N-total individuals with DJD)

Time Period	**Thoracic Vertebrae**	**Thoracic Vertebrae**
	Prevalence of Score of 2	**Prevalence of Score of 3**
Pre-Urbanization	3/5 0.60	2/5 0.40
Early Urbanization	8/10 0.80	2/10 0.20
Late Urbanization	5/5 1.00	0/5 0

p-values (Fisher's exact)	**3**
2	
pre vs. early	0.5604
pre vs. post	0.4444
early vs. post	0.5238

Table B.246. Temporal comparison in the severity of DJD of the thoracic vertebrae in adults (N-individuals with severity level/N-total individuals with DJD)

Time Period	**Lumbar Vertebrae**	**Lumbar Vertebrae**
	Prevalence of Score of 2	**Prevalence of Score of 3**
Pre-Urbanization	3/7 0.43	4/7 0.57
Early Urbanization	4/12 0.33	8/12 0.67
Late Urbanization	6/8 0.75	2/8 0.25

p-values (Fisher's exact)	**3**
2	
pre vs. early	1.0000
pre vs. post	0.3147
early vs. post	0.1698

Table B.247. Temporal comparison in the severity of DJD of the lumbar vertebrae in adults (N-individuals with severity level/N-total individuals with DJD)

Time Period	TMJ	Left Shoulder	Left Elbow	Left Knee	Right Ankle
	Prevalence of Score of 2	**Prevalence of Score of 2**	**Prevalence of Score of 2**	**Prevalence of Score of 2**	**Prevalence of Score of 2**
Pre-Urbanization	1/1 1.00	4/4 1.00	1/1 1.00	1/1 1.00	1/1 1.00
Early Urbanization	1/1 1.00	2/2 1.00	0/0 0	0/0 0	0/0 0
Late Urbanization	3/3 1.00	2/2 1.00	4/4 1.00	1/1 1.00	0/0 0
p-value (chi-square)	n/a	n/a	n/a	n/a	n/a
p-value (Fisher's exact)	n/a	n/a	n/a	n/a	n/a

Table B.248. Temporal comparison in the severity of DJD of various joints in adults (N-individuals with severity level/N-total individuals with DJD)

Time Period	Right Shoulder	Right Shoulder
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization	0/1 0	1/1 1.00
Early Urbanization	1/1 1.00	0/1 0
Late Urbanization	1/1 1.00	0/1 0

p-values (Fisher's exact)	3
2	
pre vs. early	1.0000
pre vs. post	1.0000
early vs. post	n/a

Table B.249. Temporal comparison in the severity of DJD of the right shoulder in adult females (N-individuals with severity level/N-total individuals with DJD)

Time Period	Right Elbow	Right Elbow
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization	3/3 1.00	0/3 0
Early Urbanization	1/1 1.00	0/1 0
Late Urbanization	1/2 0.50	1/2 0.50

p-values (Fisher's exact)	3
2	
pre vs. early	n/a
pre vs. post	0.4000
early vs. post	1.0000

Table B.250. Temporal comparison in the severity of DJD of the right elbow in adult females (N-individuals with severity level/N-total individuals with DJD)

Time Period	Left Wrist	Left Wrist
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization	0/0 0	0/0 0
Early Urbanization	0/0 0	0/0 0
Late Urbanization	2/3 0.67	1/3 0.33

p-values (Fisher's exact)	3
2	
pre vs. early	n/a
pre vs. post	n/a
early vs. post	n/a

Table B.251. Temporal comparison in the severity of DJD of the left wrist in adult females (N-individuals with severity level/N-total individuals with DJD)

Time Period	**Right Wrist**	**Right Wrist**
	Prevalence of Score of 2	**Prevalence of Score of 3**
Pre-Urbanization	0/1 0	1/1 1.00
Early Urbanization	0/0 0	0/0 0
Late Urbanization	1/1 1.00	0/1 0

p-values (Fisher's exact)	**3**
2	
pre vs. early	n/a
pre vs. post	1.0000
early vs. post	n/a

Table B.252. Temporal comparison in the severity of DJD of the right wrist in adult females (N-individuals with severity level/N-total individuals with DJD)

Time Period	Left Hip	Left Hip
	Prevalence of Score of 2	**Prevalence of Score of 3**
Pre-Urbanization	0/2 0	2/2 1.00
Early Urbanization	0/0 0	0/0 0
Late Urbanization	1/1 1.00	0/1 0

p-values (Fisher's exact)	**3**
2	
pre vs. early	n/a
pre vs. post	0.3333
early vs. post	n/a

Table B.253. Temporal comparison in the severity of DJD of the left hip in adult females (N-individuals with severity level/N-total individuals with DJD)

Time Period	Right Hip	Right Hip
	Prevalence of Score of 2	**Prevalence of Score of 3**
Pre-Urbanization	2/3 0.67	1/3 0.33
Early Urbanization	0/0 0	0/0 0
Late Urbanization	2/2 1.00	0/2 0

p-values (Fisher's exact)	3
2	
pre vs. early	n/a
pre vs. post	1.0000
early vs. post	n/a

Table B.254. Temporal comparison in the severity of DJD of the right hip in adult females (N-individuals with severity level/N-total individuals with DJD)

Time Period	Left Ankle	Left Ankle
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization	0/1 0	1/1 1.00
Early Urbanization	1/1 1.00	0/1 0
Late Urbanization	0/0 0	0/0 0

p-values (Fisher's exact)	3
2	
pre vs. early	1.0000
pre vs. post	n/a
early vs. post	n/a

Table B.255. Temporal comparison in the severity of DJD of the left ankle in adult females (N-individuals with severity level/N-total individuals with DJD)

Time Period	Cervical Vertebrae	Cervical Vertebrae
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization	0/1 0	1/1 1.00
Early Urbanization	0/2 0	2/2 1.00
Late Urbanization	1/3 0.33	2/3 0.67

p-values (Fisher's exact)	3
2	
pre vs. early	n/a
pre vs. post	1.0000
early vs. post	1.0000

Table B.256. Temporal comparison in the severity of DJD of the cervical vertebrae in adult females (N-individuals with severity level/N-total individuals with DJD)

Time Period	**Thoracic Vertebrae**	**Thoracic Vertebrae**
	Prevalence of Score of 2	**Prevalence of Score of 3**
Pre-Urbanization	1/2 0.50	1/2 0.50
Early Urbanization	3/5 0.60	2/5 0.40
Late Urbanization	3/3 1.00	0/3 0

p-values (Fisher's exact)	**3**
2	
pre vs. early	1.0000
pre vs. post	0.4000
early vs. post	0.4643

Table B.257. Temporal comparison in the severity of DJD of the thoracic vertebrae in adult females (N-individuals with severity level/N-total individuals with DJD)

Time Period	Lumbar Vertebrae	Lumbar Vertebrae
	Prevalence of Score of 2	**Prevalence of Score of 3**
Pre-Urbanization	1/4 0.25	3/4 0.75
Early Urbanization	0/5 0	5/5 1.00
Late Urbanization	1/2 0.50	1/2 0.50

p-values (Fisher's exact)	3
2	
pre vs. early	0.4444
pre vs. post	1.0000
early vs. post	0.2857

Table B.258. Temporal comparison in the severity of DJD of the lumbar vertebrae in adult females (N-individuals with severity level/N-total individuals with DJD)

Time Period	TMJ	Left Shoulder	Left Elbow
	Prevalence of Score of 2	Prevalence of Score of 2	Prevalence of Score of 2
Pre-Urbanization	0/0 0	0/0 0	1/1 1.00
Early Urbanization	0/0 0	1/1 1.00	0/0 0
Late Urbanization	2/2 1.00	1/1 1.00	4/4 1.00
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)	n/a	n/a	n/a
Time Period	**Left Knee**	**Right Knee**	**Right Ankle**
	Prevalence of Score of 2	**Prevalence of Score of 3**	**Prevalence of Score of 2**
Pre-Urbanization	1/1 1.00	1/1 1.00	1/1 1.00
Early Urbanization	0/0 0	0/0 0	0/0 0
Late Urbanization	1/1 1.00	1/1 1.00	0/0 0
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)	n/a	n/a	n/a

Table B.259. Temporal comparison in the severity of DJD of various joints in adult females (N-individuals with severity level/N-total individuals with DJD)

Time Period	Cervical Vertebrae	Cervical Vertebrae
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization	2/2 1.00	0/2 0
Early Urbanization	1/2 0.50	1/2 0.50
Late Urbanization	0/0 0	0/0 0

p-values (Fisher's exact)	3
2	
pre vs. early	1.0000
pre vs. post	n/a
early vs. post	n/a

Table B.260. Temporal comparison in the severity of DJD of the cervical vertebrae in adult males (N-individuals with severity level/N-total individuals with DJD)

Time Period	Thoracic Vertebrae	Thoracic Vertebrae
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization	2/3 0.67	1/3 0.33
Early Urbanization	4/4 1.00	0/4 0
Late Urbanization	2/2 1.00	0/2 0

p-values (Fisher's exact)	3
2	
pre vs. early	0.4286
pre vs. post	1.0000
early vs. post	n/a

Table B.261. Temporal comparison in the severity of DJD of the thoracic vertebrae in adult males (N-individuals with severity level/N-total individuals with DJD)

Time Period	Lumbar Vertebrae	Lumbar Vertebrae
	Prevalence of Score of 2	**Prevalence of Score of 3**
Pre-Urbanization	2/3 0.67	1/3 0.33
Early Urbanization	3/5 0.60	2/5 0.40
Late Urbanization	2/3 0.67	1/3 0.33

p-values (Fisher's exact)	**3**
2	
pre vs. early	1.0000
pre vs. post	1.0000
early vs. post	1.0000

Table B.262. Temporal comparison in the severity of DJD of the lumbar vertebrae in adult males (N-individuals with severity level/N-total individuals with DJD)

Time Period	TMJ	Left Shoulder	Right Shoulder
	Prevalence of Score of 2	Prevalence of Score of 2	Prevalence of Score of 2
Pre-Urbanization	1/1 1.00	4/4 1.00	1/1 1.00
Early Urbanization	1/1 1.00	1/1 1.00	1/1 1.00
Late Urbanization	0/0 0	1/1 1.00	2/2 1.00
p-value (chi-square)	n/a	n/a	n/a
p-value (Fisher's exact)	n/a	n/a	n/a
Time Period	**Left Elbow**	**Right Elbow**	**Left Hip**
	None	**Prevalence of Score of 2**	**Prevalence of Score of 2**
Pre-Urbanization	-	1/1 1.00	4/4 1.00
Early Urbanization	-	2/2 1.00	0/0 0
Late Urbanization	-	1/1 1.00	1/1 1.00
p-value (chi-square)	-	n/a	n/a
p-value (Fisher's exact)	-	n/a	n/a
Time Period	**Right Hip**	**Left Knee**	**Right Knee**
	Prevalence of Score of 2	**None**	**None**
Pre-Urbanization	2/2 1.00	-	-
Early Urbanization	0/0 0	-	-

Table B.263. Temporal comparison in the severity of DJD of various joints in adult males (N-individuals with severity level/N-total individuals with DJD)

Continued

Table B.263 continued			
Late Urbanization	0/0 0	-	-
p-value (chi-square)	n/a	-	-
p-value (Fisher's exact)	n/a	-	-
Time Period	**Right Knee**	**Left Wrist**	**Right Wrist**
	None	**None**	**None**
Pre-Urbanization	-	-	-
Early Urbanization	-	-	-
Late Urbanization	-	-	-
p-value (chi-square)	-	-	-
p-value (Fisher's exact)	-	-	-
Time Period	**Left Ankle**	**Right Ankle**	
	Prevalence of Score of 2	**None**	
Pre-Urbanization	1/1 1.00	-	
Early Urbanization	0/0 0	-	
Late Urbanization	0/0 0	-	
p-value (chi-square)	n/a	-	
p-value (Fisher's exact)	n/a	-	

Time Period	Right Shoulder	Right Shoulder
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization		
Females	0/1 0	1/1 1.00
Males	1/1 1.00	0/1 0
Early Urbanization		
Females	1/1 1.00	n/a
Males	1/1 1.00	n/a
Late Urbanization		
Females	1/1 1.00	n/a
Males	2/2 1.00	n/a

p-values (Fisher's Exact) Pre-urbanization	3
2	1.0000
p-values (Fisher's Exact) Early Urbanization	**3**
2	n/a
p-values (Fisher's Exact) Late Urbanization	**3**
2	n/a

Table B.264. Temporal comparison of sex differences in the severity of DJD of the right shoulder (N-individuals with severity level/N-total individuals with DJD)

Time Period	Right Elbow	Right Elbow
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization		
Females	3/3 1.00	n/a
Males	1/1 1.00	n/a
Early Urbanization		
Females	1/1 1.00	n/a
Males	2/2 1.00	n/a
Late Urbanization		
Females	1/2 0.50	1/1 0.50
Males	1/1 1.00	0/1 0

p-values (Fisher's Exact) Pre-urbanization	3
2	n/a
p-values (Fisher's Exact) Early Urbanization	**3**
2	n/a
p-values (Fisher's Exact) Late Urbanization	**3**
2	1.0000

Table B.265. Temporal comparison of sex differences in the severity of DJD of the right elbow (N-individuals with severity level/N-total individuals with DJD)

Time Period	Left Wrist	Left Wrist
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization		
Females	n/a	n/a
Males	n/a	n/a
Early Urbanization		
Females	n/a	n/a
Males	n/a	n/a
Late Urbanization		
Females	2/3 0.67	1/3 0.33
Males	0/0 0	0/0 0

p-values (Fisher's Exact) Pre-urbanization	3
2	n/a
p-values (Fisher's Exact) Early Urbanization	**3**
2	n/a
p-values (Fisher's Exact) Late Urbanization	**3**
2	n/a

Table B.266. Temporal comparison of sex differences in the severity of DJD of the left wrist (N-individuals with severity level/N-total individuals with DJD)

Time Period	Right Wrist	Right Wrist
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization		
Females	n/a	1/1 1.00
Males	n/a	0/0 0
Early Urbanization		
Females	n/a	n/a
Males	n/a	n/a
Late Urbanization		
Females	1/1 1.00	n/a
Males	0/0 0	n/a

p-values (Fisher's Exact) Pre-urbanization	3
2	n/a
p-values (Fisher's Exact) Early Urbanization	**3**
2	n/a
p-values (Fisher's Exact) Late Urbanization	**3**
2	n/a

Table B.267. Temporal comparison of sex differences in the severity of DJD of the right wrist (N-individuals with severity level/N-total individuals with DJD)

Time Period	Left Hip	Left Hip
	Prevalence of Score of 2	**Prevalence of Score of 3**
Pre-Urbanization		
Females	0/2 0	2/2 1.00
Males	4/4 1.00	0/4 0
Early Urbanization		
Females	n/a	n/a
Males	n/a	n/a
Late Urbanization		
Females	1/1 1.00	n/a
Males	1/1 1.00	n/a

p-values (Fisher's Exact) Pre-urbanization	**3**
2	0.0667
p-values (Fisher's Exact) Early Urbanization	**3**
2	n/a
p-values (Fisher's Exact) Late Urbanization	**3**
2	n/a

Table B.268. Temporal comparison of sex differences in the severity of DJD of the left hip (N-individuals with severity level/N-total individuals with DJD)

Time Period	Right Hip	Right Hip
	Prevalence of Score of 2	**Prevalence of Score of 3**
Pre-Urbanization		
Females	2/3 0.67	1/3 0.33
Males	2/2 1.00	0/0 0
Early Urbanization		
Females	n/a	n/a
Males	n/a	n/a
Late Urbanization		
Females	2/2 1.00	n/a
Males	0/0 0	n/a

p-values (Fisher's Exact) Pre-urbanization	**3**
2	1.0000
p-values (Fisher's Exact) Early Urbanization	**3**
2	n/a
p-values (Fisher's Exact) Late Urbanization	**3**
2	n/a

Table B.269. Temporal comparison of sex differences in the severity of DJD of the right hip (N-individuals with severity level/N-total individuals with DJD)

Time Period	Left Ankle	Left Ankle
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization		
Females	0/1 0	1/1 1.00
Males	1/1 1.00	0/1 0
Early Urbanization		
Females	1/1 1.00	n/a
Males	0/0 0	n/a
Late Urbanization		
Females	n/a	n/a
Males	n/a	n/a

p-values (Fisher's Exact) Pre-urbanization	3
2	1.0000
p-values (Fisher's Exact) Early Urbanization	**3**
2	n/a
p-values (Fisher's Exact) Late Urbanization	**3**
2	n/a

Table B.270. Temporal comparison of sex differences in the severity of DJD of the left ankle (N-individuals with severity level/N-total individuals with DJD)

Time Period	Cervical Vertebrae	Cervical Vertebrae
	Prevalence of Score of 2	**Prevalence of Score of 3**
Pre-Urbanization		
Females	0/1 0	1/1 1.00
Males	2/2 1.00	0/2 0
Early Urbanization		
Females	0/2 0	2/2 1.00
Males	1/2 0.50	1/2 0.50
Late Urbanization		
Females	1/3 0.33	2/3 0.67
Males	0/0 0	0/0 0

p-values (Fisher's Exact) Pre-urbanization	3
2	0.3333
p-values (Fisher's Exact) Early Urbanization	**3**
2	1.0000
p-values (Fisher's Exact) Late Urbanization	**3**
2	n/a

Table B.271. Temporal comparison of sex differences in the severity of DJD of the cervical vertebrae (N-individuals with severity level/N-total individuals with DJD)

Time Period	Thoracic Vertebrae	Thoracic Vertebrae
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization		
Females	1/2 0.50	1/2 0.50
Males	2/3 0.67	1/3 0.33
Early Urbanization		
Females	3/5 0.60	2/5 0.40
Males	4/4 1.00	0/4 0
Late Urbanization		
Females	3/3 1.00	n/a
Males	2/2 1.00	n/a

p-values (Fisher's Exact) Pre-urbanization	3
2	1.0000
p-values (Fisher's Exact) Early Urbanization	**3**
2	0.4444
p-values (Fisher's Exact) Late Urbanization	**3**
2	n/a

Table B.272. Temporal comparison of sex differences in the severity of DJD of the thoracic vertebrae (N-individuals with severity level/N-total individuals with DJD)

Time Period	Lumbar Vertebrae	Lumbar Vertebrae
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization		
Females	1/4 0.25	3/4 0.75
Males	2/3 0.67	1/3 0.33
Early Urbanization		
Females	0/5 0	5/5 1.00
Males	3/5 0.50	2/5 0.40
Late Urbanization		
Females	1/2 0.50	1/2 0.50
Males	2/3 0.67	1/3 0.33

p-values (Fisher's Exact) Pre-urbanization	3
2	0.4857
p-values (Fisher's Exact) Early Urbanization	**3**
2	0.0606
p-values (Fisher's Exact) Late Urbanization	**3**
2	1.0000

Table B.273. Temporal comparison of sex differences in the severity of DJD of the lumbar vertebrae (N-individuals with severity level/N-total individuals with DJD)

Time Period	TMJ	Left Shoulder	Left Elbow
	Prevalence of Score of 2	**Prevalence of Score of 2**	**Prevalence of Score of 2**
Pre-Urbanization			
Females	0/0 0	0/0 0	1/1 1.00
Males	1/1 1.00	4/4 1.00	0/0 0
p-value (Fisher's exact)	n/a	n/a	n/a
Early Urbanization			
Females	0/0 0	1/1 1.00	n/a
Males	1/1 1.00	1/1 1.00	n/a
p-value (Fisher's exact)	n/a	n/a	n/a
Late Urbanization			
Females	2/2 1.00	1/1 1.00	4/4 1.00
Males	0/0 0	1/1 1.00	0/0 0
p-value (Fisher's exact)	n/a	n/a	n/a

Table B.274. Temporal comparison of sex differences in the severity of DJD of various joints (N-individuals with severity level/N-total individuals with DJD)

Continued

Table B.274 continued			
Time Period	**Left Knee**	**Right Knee**	**Right Ankle**
	Prevalence of Score of 2	**Prevalence of Score of 3**	**Prevalence of Score of 2**
Pre-Urbanization			
Females	1/1 1.00	1/1 1.00	1/1 1.00
Males	0/0 0	0/0 0	0/0 0
p-value (Fisher's exact)	n/a	n/a	n/a
Early Urbanization			
Females	n/a	n/a	n/a
Males	n/a	n/a	n/a
p-value (Fisher's exact)	n/a	n/a	n/a
Late Urbanization			
Females	1/1 1.00	1/1 1.00	n/a
Males	0/0 0	0/0 0	n/a
p-value (Fisher's exact)	n/a	n/a	n/a

Time Period	TMJ	Left Shoulder	Right Shoulder	Left Elbow
	Prevalence of Score of 2	Prevalence of Score of 2	Prevalence of Score of 2	Prevalence of Score of 2
Pre-Urbanization	0/0 0	-	-	-
Early Urbanization	0/0 0	0/0 0	0/0 0	0/0 0
Late Urbanization	1/1 1.00	1/1 1.00	1/1 1.00	2/2 1.00

Time Period	Right Elbow	Left Wrist	Right Wrist
	Prevalence of Score of 3	Prevalence of Score of 2	Prevalence of Score of 2
Pre-Urbanization	0/0 0	-	-
Early Urbanization	0/0 0	0/0 0	0/0 0
Late Urbanization	1/1 1.00	1/1 1.00	1/1 1.00

Table B.275. Temporal comparison of DJD severity (TMJ, upper limb joints) in young adult (YA) females (N-individuals with severity level/N-total individuals with DJD)

Time period	Left Hip	Right Hip	Left Knee
	None	Prevalence of Score of 2	Prevalence of Score of 2
Pre-Urbanization	-	0/0 0	-
Early Urbanization	-	0/0 0	0/0 0
Late Urbanization	-	1/1 1.00	1/1 1.00
Time Period	**Right Knee**	**Left Ankle**	**Right Ankle**
	Prevalence of Score of 3	**None**	**None**
Pre-Urbanization	-	-	-
Early Urbanization	0/0 0	-	-
Late Urbanization	1/1 1.00	-	-

Table B.276. Temporal comparison of DJD severity (lower joints) in young adult (YA) females (N-individuals with severity level/N-total individuals with DJD)

Time Period	**Cervical Vertebrae**	**Thoracic Vertebrae**	**Lumbar Vertebrae**
	Prevalence of Score of 3	**Prevalence of Score of 2**	**Prevalence of Score of 3**
Pre-Urbanization	0/0 0	-	-
Early Urbanization	0/0 0	0/0 0	0/0 0
Late Urbanization	1/1 1.00	1/1 1.00	1/1 1.00

Table B.277. Temporal comparison of DJD severity (vertebrae) in young adult (YA) females (N-individuals with severity level/N-total individuals with DJD)

Time Period	Left Wrist	Left Wrist
	Prevalence of Score of 2	**Prevalence of Score of 3**
Pre-Urbanization	-	-
Early Urbanization	0/0 0	0/0 0
Late Urbanization	1/2 0.50	1/2 0.50

p-values (Fisher's exact)	**3**
2	
pre vs. early	-
pre vs. late	-
early vs. late	n/a

Table B.278. Temporal comparison of DJD severity (left wrist) in middle adult (MA) females (N-individuals with severity level/N-total individuals with DJD)

Time Period	TMJ	Left Shoulder	Right Shoulder
	None	Prevalence of Score of 2	Prevalence of Score of 2
Pre-Urbanization	-	0/0 0	0/0 0
Early Urbanization	-	1/1 1.00	1/1 1.00
Late Urbanization	-	0/0 0	0/0 0
Time Period	**Left Elbow**	**Right Elbow**	**Right Wrist**
	Prevalence of Score of 2	**Prevalence of Score of 3**	**None**
Pre-Urbanization	0/0 0	0/0 0	-
Early Urbanization	0/0 0	1/1 1.00	-
Late Urbanization	2/2 1.00	1/1 1.00	-

Table B.279. Temporal comparison of DJD severity (TMJ, upper limb joints) in middle adult (MA) females (N-individuals with severity level/N-total individuals with DJD)

Time Period	Left Hip	Right Hip	Left Knee
	Prevalence of Score of 3	Prevalence of Score of 2	None
Pre-Urbanization	1/1 1.00	1/1 1.00	-
Early Urbanization	0/0 0	0/0 0	-
Late Urbanization	0/0 0	1/1 1.00	-
Time Period	**Right Knee**	**Left Ankle**	**Right Ankle**
	None	**Prevalence of Score of 2**	**None**
Pre-Urbanization	-	0/0 0	-
Early Urbanization	-	1/1 1.00	-
Late Urbanization	-	0/0 0	-

Table B.280. Temporal comparison of DJD severity (lower limb joints) in middle adult (MA) females (N-individuals with severity level/N-total individuals with DJD)

Time Period	Cervical Vertebrae	Cervical Vertebrae
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization	-	-
Early Urbanization	0/2 0	2/2 1.00
Late Urbanization	1/2 0.50	1/2 0.50

p-values (Fisher's exact)	3
2	
pre vs. early	-
pre vs. late	-
early vs. late	1.0000

Table B.281. Temporal comparison of DJD severity (cervical vertebrae) in middle adult (MA) females (N-individuals with severity level/N-total individuals with DJD)

Time Period	**Thoracic Vertebrae**	**Thoracic Vertebrae**
	Prevalence of Score of 2	**Prevalence of Score of 3**
Pre-Urbanization	0/1 0	1/1 1.00
Early Urbanization	2/4 0.50	2/4 0.50
Late Urbanization	2/2 1.00	0/2 0

p-values (Fisher's exact)	**3**
2	
pre vs. early	1.0000
pre vs. late	0.3333
early vs. late	0.4667

Table B.282. Temporal comparison of DJD severity (thoracic vertebrae) in middle adult (MA) females (N-individuals with severity level/N-total individuals with DJD)

Time Period	Lumbar Vertebrae	Lumbar Vertebrae
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization	0/1 0	1/1 1.00
Early Urbanization	0/4 0	4/4 1.00
Late Urbanization	1/1 1.00	0/1 0

p-values (Fisher's exact)	3
2	
pre vs. early	n/a
pre vs. late	1.0000
early vs. late	0.2000

Table B.283. Temporal comparison of DJD severity (lumbar vertebrae) in middle adult (MA) females (N-individuals with severity level/N-total individuals with DJD)

Time Period	TMJ	Left Shoulder	Right Shoulder	Left Elbow
	None	None	Prevalence of Score of 3	None
Pre-Urbanization	-	-	1/1 1.00	-
Early Urbanization	-	-	0/0 0	-
Late Urbanization	-	-	-	-

Time Period	Right Elbow	Left Wrist	Right Wrist
	Prevalence of Score of 2	None	Prevalence of Score of 3
Pre-Urbanization	1/1 1.00	-	1/1 1.00
Early Urbanization	0/0 0	-	0/0 0
Late Urbanization	-	-	-

Table B.284. Temporal comparison of DJD severity (TMJ, upper limb joints) in old adult (OA) females (N-individuals with severity level/N-total individuals with DJD)

Time Period	Left Hip	Right Hip	Left Knee
	None	Prevalence of Score of 2	Prevalence of Score of 2
Pre-Urbanization	-	1/1 1.00	1/1 1.00
Early Urbanization	-	0/0 0	0/0 0
Late Urbanization	-	-	-

Time Period	Right Knee	Left Ankle	Right Ankle
	Prevalence of 3	Prevalence of 3	Prevalence of 2
Pre-Urbanization	1/1 1.00	1/1 1.00	1/1 1.00
Early Urbanization	0/0 0	0/0 0	0/0 0
Late Urbanization	-	-	-

Table B.285. Temporal comparison of DJD severity (lower limb joints) in old adult (OA) females (N-individuals with severity level/N-total individuals with DJD)

Time Period	Cervical Vertebrae	Thoracic Vertebrae	Lumbar Vertebrae
	Prevalence of Score of 3	**Prevalence of Score of 2**	**None**
Pre-Urbanization	1/1 1.00	1/1 1.00	-
Early Urbanization	0/0 0	0/0 0	-
Late Urbanization	-	-	-

Table B.286. Temporal comparison of DJD severity (vertebrae) in old adult (OA) females (N-individuals with severity level/N-total individuals with DJD)

Time Period	TMJ	Left Shoulder	Right Shoulder	Left Elbow
	None	Prevalence of Score of 2	None	None
Pre-Urbanization	-	1/1 1.00	-	-
Early Urbanization	-	0/0 0	-	-
Late Urbanization	-	-	-	-

Time Period	Right Elbow	Left Wrist	Right Wrist
	Prevalence of Score of 2	None	None
Pre-Urbanization	0/0 0	-	-
Early Urbanization	1/1 1.00	-	-
Late Urbanization	0/0 0	-	-

Table B.287. Temporal comparison of DJD severity (TMJ, upper limb joints) in young adult (YA) males (N-individuals with severity level/N-total individuals with DJD)

Time Period	Left Hip	Right Hip	Left Knee
	Prevalence of Score of 2	None	None
Pre-Urbanization	0/0 0	-	-
Early Urbanization	0/0 0	-	-
Late Urbanization	1/1 1.00	-	-
Time Period	**Right Knee**	**Left Ankle**	**Right Ankle**
	None	**None**	**NOne**
Pre-Urbanization	-	-	-
Early Urbanization	-	-	-
Late Urbanization	-	-	-

Table B.288. Temporal comparison of DJD severity (lower limb joints) in young adult (YA) males (N-individuals with severity level/N-total individuals with DJD)

Time Period	Lumbar Vertebrae	Lumbar Vertebrae
	Prevalence of Score of 2	**Prevalence of Score of 3**
Pre-Urbanization	1/1 1.00	0/1 0
Early Urbanization	1/2 0.50	1/2 0.50
Late Urbanization	1/2 0.50	1/2 0.50

p-values (Fisher's exact)	3
2	
pre vs. early	1.0000
pre vs. late	1.0000
early vs. late	1.0000

Table B.289. Temporal comparison of DJD severity (lumbar vertebrae) in young adult (YA) males (N-individuals with severity level/N-total individuals with DJD)

Time Period	Cervical Vertebrae	Thoracic Vertebrae
	Prevalence of Score of 2	**Prevalence of Score of 2**
Pre-Urbanization	0/0 0	1/1 1.00
Early Urbanization	1/1 1.00	2/2 1.00
Late Urbanization	0/0 0	0/0 0

Table B.290. Temporal comparison of DJD severity (vertebrae) in young adult (YA) males (N-individuals with severity level/N-total individuals with DJD)

Time Period	TMJ	Left Shoulder	Right Shoulder	Left Elbow
	Prevalence of Score of 2	Prevalence of Score of 2	Prevalence of Score of 2	None
Pre-Urbanization	1/1 1.00	1/1 1.00	1/1 1.00	-
Early Urbanization	0/0 0	0/0 0	1/1 1.00	-
Late Urbanization	0/0 0	0/0 0	1/1 1.00	-

Time Period	Right Elbow	Left Wrist	Right Wrist
	Prevalence of Score of 2	None	None
Pre-Urbanization	0/0 0	-	-
Early Urbanization	1/1 1.00	-	-
Late Urbanization	1/1 1.00	-	-

Table B.291. Temporal comparison of DJD severity (TMJ, upper limb joints) in middle adult (MA) males (N-individuals with severity level/N-total individuals with DJD)

Time Period	Left Hip	Right Hip	Left Knee
	Prevalence of Score of 2	**Prevalence of Score of 2**	**None**
Pre-Urbanization	2/2 1.00	2/2 1.00	-
Early Urbanization	0/0 0	0/0 0	-
Late Urbanization	0/0 0	0/0 0	-
Time Period	**Right Knee**	**Left Ankle**	**Right Ankle**
	None	**None**	**None**
Pre-Urbanization	-	-	-
Early Urbanization	-	-	-
Late Urbanization	-	-	-

Table B.292. Temporal comparison of DJD severity (lower limb joints) in middle adult (MA) males (N-individuals with severity level/N-total individuals with DJD)

Time Period	Lumbar Vertebrae	Lumbar Vertebrae
	Prevalence of Score of 2	Prevalence of Score of 3
Pre-Urbanization	0/0 0	0/0 0
Early Urbanization	2/3 0.67	1/3 0.33
Late Urbanization	1/1 1.00	0/1 0

p-values (Fisher's exact)	3
2	
pre vs. early	n/a
pre vs. late	n/a
early vs. late	1.0000

Table B.293. Temporal comparison of DJD severity (lumbar vertebrae) in middle adult (MA) males (N-individuals with severity level/N-total individuals with DJD)

Time Period	Cervical Vertebrae	Thoracic Vertebrae
	Prevalence of Score of 3	**Prevalence of Score of 2**
Pre-Urbanization	0/0 0	0/0 0
Early Urbanization	1/1 1.00	1/1 1.00
Late Urbanization	0/0 0	1/1 1.00

Table B.294. Temporal comparison of DJD severity (vertebrae) in middle adult (MA) males (N-individuals with severity level/N-total individuals with DJD)

Time Period	TMJ	Left Shoulder	Right Shoulder	Left Elbow
	None	Prevalence of Score of 2	None	None
Pre-Urbanization	-	2/2 1.00	-	-
Early Urbanization	-	-	-	-
Late Urbanization	-	-	-	-

Time Period	Right Elbow	Left Wrist	Right Wrist
	Prevalence of Score of 2	None	None
Pre-Urbanization	1/1 1.00	-	-
Early Urbanization	-	-	-
Late Urbanization	-	-	-

Table B.295. Temporal comparison of DJD severity (TMJ, upper limb joints) in old adult (OA) males (N-individuals with severity level/N-total individuals with DJD)

Time Period	Left Hip	Right Hip	Left Knee
	Prevalence of Score of 2	**None**	**None**
Pre-Urbanization	2/2 1.00	-	-
Early Urbanization	-	-	-
Late Urbanization	-	-	-
Time Period	**Right Knee**	**Left Ankle**	**Right Ankle**
	None	**Prevalence of Score of 2**	**None**
Pre-Urbanization	-	1/1 1.00	-
Early Urbanization	-	-	-
Late Urbanization	-	-	-

Table B.296. Temporal comparison of DJD severity (lower limb joints) in old adult (OA) males (N-individuals with severity level/N-total individuals with DJD)

Time Period	Cervical Vertebrae	Thoracic Vertebrae	Lumbar Vertebrae
	Prevalence of Score of 2	Prevalence of Score of 2	Prevalence of Score of 2
Pre-Urbanization	2/2 1.00	1/1 1.00	2/2 1.00
Early Urbanization	-	-	-
Late Urbanization	-	-	-

Table B.297. Temporal comparison of DJD severity (vertebrae) in old adult (OA) males (N-individuals with severity level/N-total individuals with DJD)

Time Period	Trauma
Pre-Urbanization	2/30 0.07
Early Urbanization	2/37 0.05
Late Urbanization	2/28 0.07
p-value (chi-square)	n/a
p-value (Fisher's exact)	
pre vs. early	1.0000
pre vs. late	1.0000
early vs. late	1.0000

Table B.298. Temporal comparison of prevalence of trauma in adults (N-affected/N-total; prevalence rate)

Time Period	Trauma
Pre-Urbanization	0/10 0
Early Urbanization	0/14 0
Late Urbanization	1/13 0.08
p-value (chi-square)	n/a
p-value (Fisher's exact)	
pre vs. early	n/a
pre vs. late	1.0000
early vs. late	0.4815

Table B.299. Temporal comparison of prevalence of trauma in adult females (N-affected/N-total; prevalence rate)

Time Period	Trauma
Pre-Urbanization	1/11 0.09
Early Urbanization	2/9 0.22
Late Urbanization	1/7 0.14
p-value (chi-square)	n/a
p-value (Fisher's exact)	
pre vs. early	0.5658
pre vs. late	1.0000
early vs. late	1.0000

Table B.300. Temporal comparison of prevalence of trauma in adult males (N-affected/N-total; prevalence rate)

Time Period	Trauma
Pre-Urbanization	0/13 0
Early Urbanization	0/27 0
Late Urbanization	0/14 0
p-value (chi-square)	n/a
p-value (Fisher's exact)	n/a

Table B.301. Temporal comparison of prevalence of trauma in subadults (N-affected/N-total; prevalence rate)

Time Period	Trauma
Pre-Urbanization	
Females	0/10 0
Males	1/11 0.09
p-value (Fisher's exact)	1.0000
Early Urbanization	
Females	0/14 0
Males	2/9 0.22
p-value (Fisher's exact)	0.1423
Late Urbanization	
Females	1/13 0.08
Males	1/7 0.14
p-value (Fisher's exact)	1.0000

Table B.302. Temporal comparison of sex differences in prevalence of trauma (N-affected/N-total; prevalence rate)

Time Period	**Trauma**
Pre-Urbanization	
Adult	2/30 0.07
Subadult	0/13 0
p-value (Fisher's exact)	1.0000
Early Urbanization	
Adult	2/37 0.05
Subadult	0/27 0
p-value (Fisher's exact)	0.5045
Late Urbanization	
Adult	2/28 0.07
Subadult	0/15 0
p-value (Fisher's exact)	0.5349

Table B.303. Temporal comparison of age differences in prevalence of trauma (N-affected/N-total; prevalence rate)

APPENDIX C

RAW DATA

SITE ID	GRAVE #	TIME PERIOD	AGE	SEX	CO	PH	EH MAND CAN
491	24	U	A	U	0	0	0
491	46	POST	YA	F	1	1	0
491	67	URB	MA	F	1	1	2
491	67a	PRE	C1	U	1	0	0
491	31	POST	U	U	1	1	0
491	27a	URB	A	U	0	0	0
491	25	U	OA	M	0	0	0
491	33	URB	YA	F	3	1	0
491	35	POST	MA	M	1	2	0
491	49	URB	C1	U	2	1	0
491	47	POST	MA	F	1	1	0
491	34	PRE	C2	U	1	1	0
491	68	PRE	YA	M	1	1	2
491	64	PRE	MA	F	1	2	0
491	89	URB	A	U	0	0	0
491	69	PRE	A	U	1	1	0
491	73	URB	A	U	0	0	0
491	80	URB	A	U	0	0	0
491	70/71	U	A	F	1	0	0
491	71	U	A	F	1	1	0
491	70	U	A	F	1	1	0
491	41	POST	C2	U	2	1	1
491	42	URB	A	M	1	2	1
491	44	POST	C2	U	1	1	0
491	86a	URB	A	U	1	1	0
491	86b	URB	C	U	0	0	0
491	84	URB	A	U	0	0	0
491	61	URB	C1	U	1	1	0
491	48	POST	C1	U	2	0	0
491	85	URB	C2	U	2	1	0
491	72	U	A	U	1	1	0
491	76	URB	A	U	1	2	0
491	82a	POST	U	U	0	0	0
491	101	U	A	U	0	1	0
491	77	POST	F	U	1	1	0

SITE ID	GRAVE #	TIME PERIOD	AGE	SEX	CO	PH	EH MAND CAN
491	114	POST	MA	F	1	1	3
491	117	POST	A	F	2	1	1
491	82	POST	C1	U	1	1	0
491	75	PRE	C2	U	0	0	0
491	105	U	U	U	0	0	0
491	62	URB	U	U	1	1	0
491	45	URB	C1	U	1	1	0
491	0	POST	C2	U	0	1	0
491	1	URB	C2	U	0	0	0
491	2	U	A	U	0	1	0
491	3	U	C4	U	0	0	0
491	4	POST	A	U	0	0	0
491	5	POST	A	F	1	1	1
491	9	POST	YA	M	1	1	0
491	10	POST	A	M	0	0	1
491	11	URB	MA	M	1	1	1
491	12	URB	C1	U	1	1	0
491	15	U	A	U	0	0	0
491	16	U	A	U	0	1	2
491	17	POST	C1	U	1	1	0
491	18	PRE	A	U	0	0	0
491	19	PRE	A	F	1	1	0
491	20	URB	MA	F	1	1	0
491	7	URB	C4	U	0	1	2
491	21	POST	A	F	1	1	0
491	22	PRE	A	F	0	0	0
491	22a	PRE	A	U	0	0	2
491	27	POST	A	F	1	1	0
491	28	U	A	M	1	2	0
491	29	U	C	U	0	1	0
491	30	POST	U	U	0	0	0
491	32	URB	YA	F	1	1	1
491	33a	URB	A	U	0	0	0
491	34a	PRE	C1	U	0	0	0
491	36	POST	C1	U	1	1	0

SITE ID	GRAVE #	TIME PERIOD	AGE	SEX	CO	PH	EH MAND CAN
491	37	PRE	A	U	0	0	0
491	38	PRE	OA	M	1	1	1
491	39	URB	MA	F	1	1	1
491	40	URB	MA	M	1	2	3
491	43	POST	MA	M	0	2	0
491	50	URB	C1	U	2	1	0
491	51	PRE	C2	U	1	1	0
491	52	PRE	C1	U	1	1	0
491	53	POST	C	U	0	0	0
491	54	URB	MA	M	1	1	2
491	55	URB	C1	U	0	0	0
491	57	U	U	U	1	1	0
491	58	PRE	OA	F	1	1	1
491	58a	PRE	C1	U	0	0	0
491	59	PRE	U	U	2	0	0
491	60	URB	MA	F	1	1	0
491	63	URB	C1	U	1	1	0
491	65	URB	C1	U	1	1	0
491	66	URB	MA	F	1	1	2
491	72a	U	C1	U	0	0	0
491	78	URB	C	U	0	0	0
491	79	PRE	OA	M	1	2	1
491	81	POST	U	U	1	0	0
491	83	U	OA	M	0	0	2
491	86c	URB	U	U	0	0	0
491	87	URB	C2	U	1	1	2
491	88	PRE	A	U	0	0	0
491	100	URB	C2	U	3	1	0
491	106	URB	C1	U	1	1	0
491	107	URB	C1	U	2	1	0
491	108a	URB	A	U	0	0	0
491	109	PRE	MA	M	1	2	3
491	109a	PRE	U	U	2	1	0
491	110	URB	A	F	1	2	2
491	111	PRE	MA	M	0	0	0

SITE ID	GRAVE #	TIME PERIOD	AGE	SEX	CO	PH	EH MAND CAN
491	111a	PRE	C1	U	0	0	0
491	112	URB	C	U	0	0	0
491	115	PRE	A	F	2	1	3
491	116	PRE	MA	M	1	2	2
491	118	URB	A	M	1	1	2
491	119	URB	C2	U	2	1	1
491	120	URB	C1	U	0	1	0
491	121	POST	U	U	1	1	0
491	122	URB	C2	U	2	1	0
491	123	URB	C3	U	1	1	1
491	123a	URB	U	U	0	0	0
491	124	U	A	F	1	1	0
491	125	U	C2	U	0	1	0
491	126	URB	YA	M	3	1	2
491	127	URB	C1	U	0	0	0
491	128	PRE	A	U	1	1	0
491	128a	PRE	U	U	0	0	0
491	129	PRE	OA	M	0	0	0
491	130	URB	MA	F	0	0	0
491	131	PRE	A	U	1	0	0
491	132	URB	C4	M	1	2	2
491	133	PRE	C2	U	2	1	0
491	134	URB	C3	U	0	0	0
491	136	URB	MA	M	0	0	0
491	137	PRE	A	U	0	0	0
491	138	URB	OA	F	1	1	2
491	138a	URB	A	U	0	0	0
491	104	POST	C1	U	1	1	0
491	102	POST	U	U	1	1	0
491	13	PRE	A	M	0	0	0
491	5a	POST	A	U	0	0	0
491	135a	U	A	M	1	2	0
491	135b	U	A	U	0	1	0
491	135c	U	A	F	1	1	0
491	99	POST	U	U	0	0	0

SITE ID	GRAVE #	TIME PERIOD	AGE	SEX	CO	PH	EH MAND CAN
491	95	U	A	U	0	0	0
491	97	URB	YA	F	0	0	0
491	96	U	U	U	1	1	0
491	98	URB	C1	U	2	1	0
491	8	POST	A	F	2	1	0
491	108	URB	YA	M	1	1	1
491	108b	URB	A	F	3	2	0
491	7b	URB	YA	F	1	1	0
491	144	POST	MA	M	1	1	2
491	140	POST	YA	M	1	1	0
491	139	PRE	MA	F	1	1	1
491	155	PRE	A	F	1	1	1
491	150	PRE	C2	U	1	1	1
491	156	URB	A	F	1	1	2
491	159	POST	A	F	1	1	2
491	160	URB	MA	U	0	0	0
491	165	URB	A	U	0	0	0
491	164	URB	YA	U	0	0	0
491	146	POST	A	F	1	1	0
491	158	URB	A	U	0	0	0
491	163	URB	C1	U	0	0	0
491	161	URB	A	U	1	0	2
491	162	U	YA	U	0	1	0
491	157	POST	C1	U	1	1	0
491	161a	PRE	C2	U	0	1	0
526	7	POST	C3	U	0	0	0
526	10	POST	C3	U	1	2	2
526	4	POST	C4	U	2	2	2
526	12	POST	A	U	0	0	0
526	0	POST	A	U	1	1	0
526	11	POST	A	U	0	0	0
526	1	POST	MA	F	1	1	0
526	3	POST	A	F	0	0	0
526	5	POST	YA	U	0	0	0
526	2	POST	YA	F	2	1	3

SITE ID	GRAVE #	TIME PERIOD	AGE	SEX	CO	PH	EH MAND CAN
526	9	POST	C3	U	2	1	1
526	13	POST	A	U	1	1	0
526	15	POST	YA	M	0	0	0
526	UNK	POST	A	U	1	2	0
533	2	PRE	MA	M	0	0	1
533	1	PRE	A	F	1	1	3
533	7	PRE	A	F	0	1	2
533	9	PRE	A	M	1	1	1
533	8	PRE	YA	F	1	1	3
533	4a	PRE	A	U	0	0	0
533	4b	PRE	C2	U	0	0	0
533	6	PRE	U	U	2	1	0
533	3	PRE	C2	U	0	1	0
533	10	PRE	A	M	1	1	1
SITE ID	**GRAVE #**	**EH MAND CAN**	**EH MAND INC**	**EH MAX CAN**	**EH MAX INC**	**# CARIES**	**# ATL**
491	24	0	0	0	0	.	.
491	46	0	0	0	0	.	32
491	67	2	0	0	0	6	4
491	67a	0	0	0	0	.	.
491	31	0	0	0	0	.	.
491	27a	0	0	0	0	.	.
491	25	0	0	0	0	.	.
491	33	0	0	2	1	0	2
491	35	0	2	2	1	6	0
491	49	0	0	0	0	.	.
491	47	0	1	0	0	0	5
491	34	0	2	0	0	0	0
491	68	2	2	2	2	1	1
491	64	0	0	1	1	4	12
491	89	0	0	0	0	.	.
491	69	0	1	1	1	0	2
491	73	0	0	0	0	.	.
491	80	0	0	0	0	.	.
491	70/71	0	0	0	0	1	2

SITE ID	GRAVE #	EH MAND CAN	EH MAND INC	EH MAX CAN	EH MAX INC	# CARIES	# ATL
491	71	0	0	0	0	.	.
491	70	0	0	0	0	.	.
491	41	1	3	0	1	0	0
491	42	1	1	2	2	0	0
491	44	0	3	0	3	0	0
491	86a	0	0	2	1	0	0
491	86b	0	0	0	0	.	.
491	84	0	0	0	0	.	.
491	61	0	0	0	0	.	.
491	48	0	0	0	0	.	.
491	85	0	1	0	1	0	0
491	72	0	0	0	0	.	.
491	76	0	0	0	0	0	0
491	82a	0	0	0	0	.	.
491	101	0	0	0	0	.	.
491	77	0	0	0	0	.	.
491	114	3	0	0	0	3	1
491	117	1	1	1	1	0	0
491	82	0	0	0	0	.	.
491	75	0	0	0	0	0	0
491	105	0	0	0	0	.	.
491	62	0	0	0	0	.	.
491	45	0	0	0	0	.	.
491	0	0	0	0	0	0	0
491	1	0	0	0	0	0	.
491	2	0	0	0	0	.	.
491	3	0	0	0	0	.	.
491	4	0	0	0	0	.	.
491	5	1	1	1	0	1	0
491	9	0	1	1	0	1	0
491	10	1	2	0	1	0	1
491	11	1	1	1	1	1	0
491	12	0	0	0	0	.	.
491	15	0	0	0	0	.	.
491	16	2	1	1	1	0	0

SITE ID	GRAVE #	EH MAND CAN	EH MAND INC	EH MAX CAN	EH MAX INC	# CARIES	# ATL
491	17	0	0	0	0	.	.
491	18	0	0	0	0	.	.
491	19	0	0	1	0	0	0
491	20	0	0	0	1	0	0
491	7	2	0	1	1	0	0
491	21	0	0	1	0	1	4
491	22	0	0	0	0	.	.
491	22a	2	0	0	0	0	3
491	27	0	0	1	1	0	0
491	28	0	0	0	0	0	3
491	29	0	0	0	0	.	.
491	30	0	0	0	0	.	.
491	32	1	3	0	1	2	2
491	33a	0	0	0	0	.	.
491	34a	0	0	0	0	.	.
491	36	0	0	0	0	.	.
491	37	0	0	0	1	0	.
491	38	1	0	1	1	1	2
491	39	1	0	1	1	0	6
491	40	3	0	0	0	1	3
491	43	0	0	0	0	.	.
491	50	0	0	0	0	.	.
491	51	0	1	0	0	0	0
491	52	0	0	0	0	.	.
491	53	0	0	0	0	.	.
491	54	2	1	1	1	7	6
491	55	0	0	0	0	.	.
491	57	0	0	0	0	.	.
491	58	1	0	0	0	0	11
491	58a	0	0	0	0	.	.
491	59	0	0	0	0	.	.
491	60	0	0	0	0	0	4
491	63	0	0	0	0	.	.
491	65	0	0	0	0	.	.
491	66	2	0	0	0	0	7

SITE ID	GRAVE #	EH MAND CAN	EH MAND INC	EH MAX CAN	EH MAX INC	# CARIES	# ATL
491	72a	0	0	0	0	.	.
491	78	0	0	0	0	.	.
491	79	1	1	1	1	0	2
491	81	0	0	0	0	.	.
491	83	2	1	0	0	0	0
491	86c	0	0	0	0	.	.
491	87	2	2	0	0	0	0
491	88	0	0	0	0	.	.
491	100	0	0	0	0	0	0
491	106	0	0	0	0	.	.
491	107	0	0	0	0	.	.
491	108a	0	0	0	0	0	1
491	109	3	2	2	3	5	2
491	109a	0	0	0	0	.	.
491	110	2	0	1	1	0	0
491	111	0	0	0	0	.	.
491	111a	0	0	0	0	.	.
491	112	0	0	0	0	.	.
491	115	3	0	3	2	2	1
491	116	2	1	2	2	2	1
491	118	2	1	1	1	2	4
491	119	1	1	0	1	0	0
491	120	0	0	0	0	.	.
491	121	0	0	0	0	.	.
491	122	0	1	0	1	0	0
491	123	1	1	1	1	0	0
491	123a	0	0	0	0	.	.
491	124	0	0	0	0	.	.
491	125	0	0	0	0	.	.
491	126	2	0	0	2	2	3
491	127	0	0	0	0	.	.
491	128	0	0	0	0	0	0
491	128a	0	0	0	0	.	.
491	129	0	0	0	0	.	.
491	130	0	0	0	0	.	.

SITE ID	GRAVE #	EH MAND CAN	EH MAND INC	EH MAX CAN	EH MAX INC	# CARIES	# ATL
491	131	0	0	0	0	.	.
491	132	2	3	1	1	0	0
491	133	0	0	0	0	1	0
491	134	0	1	0	2	1	0
491	136	0	0	0	0	.	.
491	137	0	0	0	0	.	.
491	138	2	2	2	3	2	5
491	138a	0	0	0	0	0	.
491	104	0	0	0	0	.	.
491	102	0	0	0	0	.	.
491	13	0	0	0	0	0	1
491	5a	0	0	0	0	.	.
491	135a	0	0	1	0	0	0
491	135b	0	0	0	0	.	.
491	135c	0	0	0	0	0	0
491	99	0	0	0	0	.	.
491	95	0	0	0	0	.	.
491	97	0	0	0	0	.	.
491	96	0	0	0	0	.	.
491	98	0	0	0	0	.	.
491	8	0	0	1	1	0	0
491	108	1	0	1	1	7	5
491	108b	0	0	0	0	1	0
491	7b	0	0	1	1	3	1
491	144	2	1	1	1	0	1
491	140	0	0	1	1	0	0
491	139	1	1	0	0	0	0
491	155	1	1	1	1	2	0
491	150	1	1	0	3	0	0
491	156	2	1	0	1	0	9
491	159	2	1	1	2	3	5
491	160	0	0	0	0	.	.
491	165	0	0	0	0	.	.
491	164	0	0	0	0	.	.
491	146	0	0	0	0	1	0

SITE ID	GRAVE #	EH MAND CAN	EH MAND INC	EH MAX CAN	EH MAX INC	# CARIES	# ATL
491	158	0	0	0	0	.	.
491	163	0	0	0	0	.	.
491	161	2	0	2	2	0	0
491	162	0	0	0	0	.	.
491	157	0	0	0	0	.	.
491	161a	0	0	0	0	0	0
526	7	0	0	0	0	.	.
526	10	2	1	1	3	0	0
526	4	2	2	0	1	1	0
526	12	0	0	0	0	.	.
526	0	0	0	0	0	.	.
526	11	0	0	0	0	.	.
526	1	0	0	0	0	0	13
526	3	0	0	0	0	.	.
526	5	0	0	0	0	0	3
526	2	3	2	3	2	5	0
526	9	1	2	0	0	0	0
526	13	0	0	0	0	.	.
526	15	0	0	0	0	.	.
526	UNK	0	0	1	1	0	0
533	2	1	1	1	0	0	0
533	1	3	3	1	1	0	0
533	7	2	0	1	1	0	0
533	9	1	1	2	2	1	2
533	8	3	3	3	3	2	0
533	4a	0	0	0	0	.	.
533	4b	0	0	0	0	0	0
533	6	0	0	0	0	.	.
533	3	0	1	0	1	0	0
533	10	1	0	1	1	0	0

SITE ID	GRAVE #	# ABSCESSES	WEAR-L MAND M1	WEAR-L MAND M2	WEAR-R MAND M1	WEAR-R MAND M2	WEAR-L MAX M1
491	24	.	0	0	0	0	0
491	46	0	0	0	0	0	0

SITE ID	GRAVE #	# ABSCESSES	WEAR-L MAND M1	WEAR-L MAND M2	WEAR-R MAND M1	WEAR-R MAND M2	WEAR-L MAX M1
491	67	1	8	0	8	7	0
491	67a	.	0	0	0	0	0
491	31	.	0	0	0	0	0
491	27a	.	0	0	0	0	0
491	25	.	0	0	0	0	0
491	33	0	4	3	4	2	4
491	35	1	5	4	0	3	5
491	49	.	0	0	0	0	0
491	47	0	0	0	0	0	0
491	34	0	1	0	1	0	1
491	68	0	4	0	0	4	4
491	64	1	0	0	0	0	3
491	89	.	0	0	0	0	0
491	69	0	7	4	8	5	7
491	73	.	0	0	0	0	0
491	80	.	0	0	0	0	0
491	70/71	0	0	0	0	5	0
491	71	.	0	0	0	0	0
491	70	.	0	0	0	0	0
491	41	0	1	0	1	0	1
491	42	0	7	0	8	7	8
491	44	0	1	0	1	0	1
491	86a	0	0	0	0	0	0
491	86b	.	0	0	0	0	0
491	84	.	0	0	0	0	0
491	61	.	0	0	0	0	0
491	48	.	0	0	0	0	0
491	85	0	2	0	2	0	2
491	72	.	0	0	0	0	0
491	76	0	0	0	0	0	6
491	82a	.	0	0	0	0	0
491	101	.	0	0	0	0	0
491	77	.	0	0	0	0	0
491	114	1	6	0	6	4	5
491	117	0	5	4	4	4	4

SITE ID	GRAVE #	# ABSCESSES	WEAR-L MAND M1	WEAR-L MAND M2	WEAR-R MAND M1	WEAR-R MAND M2	WEAR-L MAX M1
491	82	.	0	0	0	0	0
491	75	0	0	0	0	0	1
491	105	.	0	0	0	0	0
491	62	.	0	0	0	0	0
491	45	.	0	0	0	0	0
491	0	0	1	0	0	0	0
491	1	.	1	0	0	0	1
491	2	.	0	0	0	0	0
491	3	.	0	0	0	0	0
491	4	.	0	0	0	0	0
491	5	0	5	4	5	4	4
491	9	0	4	3	4	3	4
491	10	0	7	6	0	6	0
491	11	2	7	5	0	6	7
491	12	.	0	0	0	0	0
491	15	.	0	0	0	0	0
491	16	0	4	3	4	3	4
491	17	.	0	0	0	0	0
491	18	.	0	0	0	0	0
491	19	1	0	0	0	0	5
491	20	0	4	3	4	3	0
491	7	0	2	3	3	2	1
491	21	0	0	0	0	0	0
491	22	.	0	0	0	0	0
491	22a	0	0	0	0	0	0
491	27	0	4	3	4	2	4
491	28	1	0	0	0	0	0
491	29	.	0	0	0	0	0
491	30	.	0	0	0	0	0
491	32	0	0	3	0	3	5
491	33a	.	0	0	0	0	0
491	34a	.	0	0	0	0	0
491	36	.	0	0	0	0	0
491	37	.	0	0	0	0	0
491	38	1	4	0	5	4	5

SITE ID	GRAVE #	# ABSCESSES	WEAR-L MAND M1	WEAR-L MAND M2	WEAR-R MAND M1	WEAR-R MAND M2	WEAR-L MAX M1
491	39	0	0	0	0	0	0
491	40	0	0	6	0	0	7
491	43	.	0	0	0	0	0
491	50	.	0	0	0	0	0
491	51	0	1	0	1	0	1
491	52	.	0	0	0	0	0
491	53	.	0	0	0	0	0
491	54	3	7	7	7	6	0
491	55	.	0	0	0	0	0
491	57	.	0	0	0	0	0
491	58	1	0	0	0	0	0
491	58a	.	0	0	0	0	0
491	59	.	0	0	0	0	0
491	60	0	0	0	0	7	8
491	63	.	0	0	0	0	0
491	65	.	0	0	0	0	0
491	66	2	0	0	0	0	8
491	72a	.	0	0	0	0	0
491	78	.	0	0	0	0	0
491	79	0	7	6	7	6	7
491	81	.	0	0	0	0	0
491	83	0	5	6	5	5	0
491	86c	.	0	0	0	0	0
491	87	0	2	1	2	1	2
491	88	.	0	0	0	0	0
491	100	0	1	0	1	0	1
491	106	.	0	0	0	0	0
491	107	.	0	0	0	0	0
491	108a	0	0	7	0	0	0
491	109	0	5	4	0	5	0
491	109a	.	0	0	0	0	0
491	110	0	5	4	4	3	6
491	111	.	0	0	0	0	0
491	111a	.	0	0	0	0	0
491	112	.	0	0	0	0	0

SITE ID	GRAVE #	# ABSCESSES	WEAR-L MAND M1	WEAR-L MAND M2	WEAR-R MAND M1	WEAR-R MAND M2	WEAR-L MAX M1
491	115	1	5	4	0	4	5
491	116	2	6	5	6	5	8
491	118	1	0	0	0	0	8
491	119	0	1	0	1	0	1
491	120	.	0	0	0	0	0
491	121	.	0	0	0	0	0
491	122	0	2	0	2	0	2
491	123	0	2	1	2	1	1
491	123a	.	0	0	0	0	0
491	124	.	0	0	0	0	0
491	125	.	0	0	0	0	0
491	126	2	0	6	6	4	0
491	127	.	0	0	0	0	0
491	128	0	5	5	0	0	0
491	128a	.	0	0	0	0	0
491	129	.	0	0	0	0	0
491	130	.	0	0	0	0	0
491	131	.	0	0	0	0	0
491	132	0	4	3	4	3	3
491	133	0	0	0	2	0	1
491	134	0	2	1	2	1	0
491	136	.	0	0	0	0	0
491	137	.	0	0	0	0	0
491	138	0	0	6	0	0	6
491	138a	.	0	3	0	0	0
491	104	.	0	0	0	0	0
491	102	.	0	0	0	0	0
491	13	0	4	4	0	4	6
491	5a	.	0	0	0	0	0
491	135a	1	0	0	0	0	0
491	135b	.	0	0	0	0	0
491	135c	0	0	0	0	0	5
491	99	.	0	0	0	0	0
491	95	.	0	0	0	0	0
491	97	.	0	0	0	0	0

SITE ID	GRAVE #	# ABSCESSES	WEAR-L MAND M1	WEAR-L MAND M2	WEAR-R MAND M1	WEAR-R MAND M2	WEAR-L MAX M1
491	96	.	0	0	0	0	0
491	98	.	0	0	0	0	0
491	8	0	0	0	0	0	4
491	108	0	5	3	0	5	0
491	108b	0	0	0	0	0	0
491	7b	0	4	0	4	5	3
491	144	0	5	4	0	6	8
491	140	0	0	0	0	0	4
491	139	0	6	0	5	4	0
491	155	0	6	4	5	4	7
491	150	0	1	0	1	0	1
491	156	0	0	0	0	0	0
491	159	0	0	0	0	0	0
491	160	.	0	0	0	0	0
491	165	.	0	0	0	0	0
491	164	.	0	0	0	0	0
491	146	0	7	5	0	0	6
491	158	.	0	0	0	0	0
491	163	.	0	0	0	0	0
491	161	0	7	6	6	5	6
491	162	.	0	0	0	0	0
491	157	.	0	0	0	0	0
491	161a	0	1	0	1	0	1
526	7	.	0	0	0	0	0
526	10	0	3	2	3	2	2
526	4	0	4	3	0	0	0
526	12	.	0	0	0	0	0
526	0	.	0	0	0	0	0
526	11	.	0	0	0	0	0
526	1	3	0	0	0	3	0
526	3	.	0	0	0	0	0
526	5	1	0	0	0	0	6
526	2	1	0	6	7	6	5
526	9	0	0	0	3	2	0
526	13	.	0	0	0	0	0

SITE ID	GRAVE #	# ABSCESSES	WEAR-L MAND M1	WEAR-L MAND M2	WEAR-R MAND M1	WEAR-R MAND M2	WEAR-L MAX M1
526	15	.	0	0	0	0	0
526	UNK	0	0	0	0	0	4
533	2	0	6	0	6	5	6
533	1	0	4	4	4	4	4
533	7	0	4	3	6	3	0
533	9	0	0	0	0	6	0
533	8	1	6	4	6	4	4
533	4a	.	0	0	0	0	0
533	4b	0	1	0	1	0	1
533	6	.	0	0	0	0	0
533	3	0	1	0	1	0	1
533	10	0	4	3	4	4	5

SITE ID	GRAVE #	WEAR-L MAX M2	WEAR-R MAX M1	WEAR-R MAX M2	FEM LENGTH	TRAUMA?	TRAUMA-CRAN
491	24	0	0	0	0	1	0
491	46	0	0	0	431	2	0
491	67	0	8	0	407	1	0
491	67a	0	0	0	0	1	0
491	31	0	0	0	0	1	0
491	27a	0	0	0	0	1	0
491	25	0	0	0	0	1	0
491	33	3	4	2	462	1	0
491	35	4	5	4	485	1	0
491	49	0	0	0	0	1	0
491	47	0	7	4	425	1	0
491	34	0	1	0	0	1	0
491	68	3	5	3	458	1	0
491	64	0	0	0	390	1	0
491	89	0	0	0	0	1	0
491	69	0	6	4	468	1	0
491	73	0	0	0	0	1	0
491	80	0	0	0	0	1	0
491	70/71	0	0	0	0	1	0
491	71	0	0	0	0	1	0

SITE ID	GRAVE #	WEAR-L MAX M2	WEAR-R MAX M1	WEAR-R MAX M2	FEM LENGTH	TRAUMA?	TRAUMA-CRAN
491	70	0	0	0	0	1	0
491	41	0	1	0	0	1	0
491	42	6	8	5	0	1	0
491	44	0	1	0	0	1	0
491	86a	0	6	0	0	1	0
491	86b	0	0	0	0	1	0
491	84	0	0	0	0	1	0
491	61	0	0	0	0	1	0
491	48	0	0	0	0	1	0
491	85	0	2	0	0	1	0
491	72	0	0	0	0	1	0
491	76	4	5	0	0	1	0
491	82a	0	0	0	0	1	0
491	101	0	0	0	0	1	0
491	77	0	0	0	0	1	0
491	114	3	6	4	405	1	0
491	117	4	5	4	418	1	0
491	82	0	0	0	0	1	0
491	75	0	1	0	0	1	0
491	105	0	0	0	0	1	0
491	62	0	0	0	0	1	0
491	45	0	0	0	0	1	0
491	0	0	1	0	0	1	0
491	1	0	0	0	0	1	0
491	2	0	0	0	0	1	0
491	3	0	0	0	0	1	0
491	4	0	0	0	0	1	0
491	5	3	4	3	0	1	0
491	9	3	4	3	0	1	0
491	10	0	0	0	0	1	0
491	11	0	0	0	0	1	0
491	12	0	0	0	0	1	0
491	15	0	0	0	0	1	0
491	16	3	5	3	0	1	0
491	17	0	0	0	0	1	0
491	18	0	0	0	438	1	0

SITE ID	GRAVE #	WEAR-L MAX M2	WEAR-R MAX M1	WEAR-R MAX M2	FEM LENGTH	TRAUMA?	TRAUMA-CRAN
491	19	0	0	0	0	1	0
491	20	0	0	0	0	1	0
491	7	2	0	1	0	1	0
491	21	0	0	0	422	1	0
491	22	0	0	0	0	1	0
491	22a	0	0	0	0	1	0
491	27	2	4	2	392	1	0
491	28	6	0	0	0	1	0
491	29	0	0	0	0	1	0
491	30	0	0	0	0	1	0
491	32	0	5	3	0	1	0
491	33a	0	0	0	0	1	0
491	34a	0	0	0	0	1	0
491	36	0	0	0	0	1	0
491	37	0	0	0	0	1	0
491	38	0	5	0	423	2	1
491	39	0	0	0	0	1	0
491	40	5	5	2	468	1	0
491	43	0	0	0	468	2	1
491	50	0	0	0	0	1	0
491	51	0	1	0	0	1	0
491	52	0	0	0	0	1	0
491	53	0	0	0	0	1	0
491	54	0	0	0	447	2	0
491	55	0	0	0	0	1	0
491	57	0	0	0	0	1	0
491	58	8	0	0	391	1	0
491	58a	0	0	0	0	1	0
491	59	0	0	0	0	1	0
491	60	0	0	0	414	1	0
491	63	0	0	0	0	1	0
491	65	0	0	0	0	1	0
491	66	0	8	8	427	1	0
491	72a	0	0	0	0	1	0
491	78	0	0	0	0	1	0
491	79	0	8	5	0	1	0

SITE ID	GRAVE #	WEAR-L MAX M2	WEAR-R MAX M1	WEAR-R MAX M2	FEM LENGTH	TRAUMA?	TRAUMA-CRAN
491	81	0	0	0	0	1	0
491	83	0	0	0	456	1	0
491	86c	0	0	0	0	1	0
491	87	1	2	1	0	1	0
491	88	0	0	0	0	1	0
491	100	0	1	0	0	1	0
491	106	0	0	0	0	1	0
491	107	0	0	0	0	1	0
491	108a	0	0	0	404	1	0
491	109	0	5	4	0	1	0
491	109a	0	0	0	0	1	0
491	110	4	5	3	0	1	0
491	111	0	0	0	450	1	0
491	111a	0	0	0	0	1	0
491	112	0	0	0	0	1	0
491	115	0	5	0	437	1	0
491	116	5	8	0	485	1	0
491	118	8	8	7	0	1	0
491	119	0	1	0	0	1	0
491	120	0	0	0	0	1	0
491	121	0	0	0	0	1	0
491	122	0	2	0	0	1	0
491	123	1	1	1	0	1	0
491	123a	0	0	0	0	1	0
491	124	0	0	0	0	1	0
491	125	0	0	0	0	1	0
491	126	6	8	0	449	1	0
491	127	0	0	0	0	1	0
491	128	0	0	0	0	2	0
491	128a	0	0	0	0	1	0
491	129	0	0	0	460	1	0
491	130	0	0	0	423	1	0
491	131	0	0	0	0	1	0
491	132	2	4	2	498	1	0
491	133	0	1	0	0	1	0
491	134	0	0	1	0	1	0

SITE ID	GRAVE #	WEAR-L MAX M2	WEAR-R MAX M1	WEAR-R MAX M2	FEM LENGTH	TRAUMA?	TRAUMA-CRAN
491	136	0	0	0	477	1	0
491	137	0	0	0	0	1	0
491	138	5	6	0	415	1	0
491	138a	0	0	0	0	1	0
491	104	0	0	0	0	1	0
491	102	0	0	0	0	1	0
491	13	5	0	0	0	1	0
491	5a	0	0	0	420	1	0
491	135a	3	0	4	0	1	0
491	135b	0	0	0	0	1	0
491	135c	0	0	0	0	1	0
491	99	0	0	0	0	1	0
491	95	0	0	0	0	1	0
491	97	0	0	0	0	1	0
491	96	0	0	0	0	1	0
491	98	0	0	0	0	1	0
491	8	3	4	3	0	1	0
491	108	0	0	0	427	2	0
491	108b	0	0	0	0	1	0
491	7b	0	3	2	425	1	0
491	144	5	6	5	0	1	0
491	140	3	4	3	0	1	0
491	139	0	8	5	398	1	0
491	155	0	5	3	435	1	0
491	150	0	0	0	0	1	0
491	156	0	0	0	0	1	0
491	159	0	0	0	0	1	0
491	160	0	0	0	461	1	0
491	165	0	0	0	0	1	0
491	164	0	0	0	432	1	0
491	146	0	0	0	0	1	0
491	158	0	0	0	0	1	0
491	163	0	0	0	0	1	0
491	161	4	6	4	0	1	0
491	162	0	0	0	0	1	0
491	157	0	0	0	0	1	0

SITE ID	GRAVE #	WEAR-L MAX M2	WEAR-R MAX M1	WEAR-R MAX M2	FEM LENGTH	TRAUMA?	TRAUMA-CRAN
491	161a	0	1	0	0	1	0
526	7	0	0	0	0	1	0
526	10	2	3	2	0	1	0
526	4	2	3	2	0	1	0
526	12	0	0	0	0	1	0
526	0	0	0	0	0	1	0
526	11	0	0	0	0	1	0
526	1	0	0	0	424	1	0
526	3	0	0	0	0	1	0
526	5	0	6	0	438	1	0
526	2	4	6	3	406	1	0
526	9	0	3	2	0	1	0
526	13	0	0	0	366	1	0
526	15	0	0	0	0	1	0
526	UNK	3	5	3	0	1	0
533	2	0	5	0	467	1	0
533	1	3	4	3	0	1	0
533	7	0	5	3	0	1	0
533	9	0	0	0	0	1	0
533	8	3	4	3	0	1	0
533	4a	0	0	0	0	1	0
533	4b	0	1	0	0	1	0
533	6	0	0	0	0	1	0
533	3	0	1	0	0	1	0
533	10	4	0	0	0	1	0

SITE ID	GRAVE #	TRAUMA-NASALS	TRAUMA-FACIAL	TRAUMA-LONG BONES	TRAUMA-OTHER	WEAPON WOUNDS
491	24	0	0	0	0	0
491	46	0	0	0	1	0
491	67	0	0	0	0	0
491	67a	0	0	0	0	0
491	31	0	0	0	0	0
491	27a	0	0	0	0	0
491	25	0	0	0	0	0

SITE ID	GRAVE #	TRAUMA-NASALS	TRAUMA-FACIAL	TRAUMA-LONG BONES	TRAUMA-OTHER	WEAPON WOUNDS
491	33	0	0	0	0	0
491	35	0	0	0	0	0
491	49	0	0	0	0	0
491	47	0	0	0	0	0
491	34	0	0	0	0	0
491	68	0	0	0	0	0
491	64	0	0	0	0	0
491	89	0	0	0	0	0
491	69	0	0	0	0	0
491	73	0	0	0	0	0
491	80	0	0	0	0	0
491	70/71	0	0	0	0	0
491	71	0	0	0	0	0
491	70	0	0	0	0	0
491	41	0	0	0	0	0
491	42	0	0	0	0	0
491	44	0	0	0	0	0
491	86a	0	0	0	0	0
491	86b	0	0	0	0	0
491	84	0	0	0	0	0
491	61	0	0	0	0	0
491	48	0	0	0	0	0
491	85	0	0	0	0	0
491	72	0	0	0	0	0
491	76	0	0	0	0	0
491	82a	0	0	0	0	0
491	101	0	0	0	0	0
491	77	0	0	0	0	0
491	114	0	0	0	0	0
491	117	0	0	0	0	0
491	82	0	0	0	0	0
491	75	0	0	0	0	0
491	105	0	0	0	0	0
491	62	0	0	0	0	0
491	45	0	0	0	0	0

SITE ID	GRAVE #	TRAUMA-NASALS	TRAUMA-FACIAL	TRAUMA-LONG BONES	TRAUMA-OTHER	WEAPON WOUNDS
491	0	0	0	0	0	0
491	1	0	0	0	0	0
491	2	0	0	0	0	0
491	3	0	0	0	0	0
491	4	0	0	0	0	0
491	5	0	0	0	0	0
491	9	0	0	0	0	0
491	10	0	0	0	0	0
491	11	0	0	0	0	0
491	12	0	0	0	0	0
491	15	0	0	0	0	0
491	16	0	0	0	0	0
491	17	0	0	0	0	0
491	18	0	0	0	0	0
491	19	0	0	0	0	0
491	20	0	0	0	0	0
491	7	0	0	0	0	0
491	21	0	0	0	0	0
491	22	0	0	0	0	0
491	22a	0	0	0	0	0
491	27	0	0	0	0	0
491	28	0	0	0	0	0
491	29	0	0	0	0	0
491	30	0	0	0	0	0
491	32	0	0	0	0	0
491	33a	0	0	0	0	0
491	34a	0	0	0	0	0
491	36	0	0	0	0	0
491	37	0	0	0	0	0
491	38	0	0	1	1	1
491	39	0	0	0	0	0
491	40	0	0	0	0	0
491	43	0	0	0	0	0
491	50	0	0	0	0	0
491	51	0	0	0	0	0

SITE ID	GRAVE #	TRAUMA-NASALS	TRAUMA-FACIAL	TRAUMA-LONG BONES	TRAUMA-OTHER	WEAPON WOUNDS
491	52	0	0	0	0	0
491	53	0	0	0	0	0
491	54	0	0	1	0	0
491	55	0	0	0	0	0
491	57	0	0	0	0	0
491	58	0	0	0	0	0
491	58a	0	0	0	0	0
491	59	0	0	0	0	0
491	60	0	0	0	0	0
491	63	0	0	0	0	0
491	65	0	0	0	0	0
491	66	0	0	0	0	0
491	72a	0	0	0	0	0
491	78	0	0	0	0	0
491	79	0	0	0	0	0
491	81	0	0	0	0	0
491	83	0	0	0	0	0
491	86c	0	0	0	0	0
491	87	0	0	0	0	0
491	88	0	0	0	0	0
491	100	0	0	0	0	0
491	106	0	0	0	0	0
491	107	0	0	0	0	0
491	108a	0	0	0	0	0
491	109	0	0	0	0	0
491	109a	0	0	0	0	0
491	110	0	0	0	0	0
491	111	0	0	0	0	0
491	111a	0	0	0	0	0
491	112	0	0	0	0	0
491	115	0	0	0	0	0
491	116	0	0	0	0	0
491	118	0	0	0	0	0
491	119	0	0	0	0	0
491	120	0	0	0	0	0

SITE ID	GRAVE #	TRAUMA-NASALS	TRAUMA-FACIAL	TRAUMA-LONG BONES	TRAUMA-OTHER	WEAPON WOUNDS
491	121	0	0	0	0	0
491	122	0	0	0	0	0
491	123	0	0	0	0	0
491	123a	0	0	0	0	0
491	124	0	0	0	0	0
491	125	0	0	0	0	0
491	126	0	0	0	0	0
491	127	0	0	0	0	0
491	128	0	0	0	1	0
491	128a	0	0	0	0	0
491	129	0	0	0	0	0
491	130	0	0	0	0	0
491	131	0	0	0	0	0
491	132	0	0	0	0	0
491	133	0	0	0	0	0
491	134	0	0	0	0	0
491	136	0	0	0	0	0
491	137	0	0	0	0	0
491	138	0	0	0	0	0
491	138a	0	0	0	0	0
491	104	0	0	0	0	0
491	102	0	0	0	0	0
491	13	0	0	0	0	0
491	5a	0	0	0	0	0
491	135a	0	0	0	0	0
491	135b	0	0	0	0	0
491	135c	0	0	0	0	0
491	99	0	0	0	0	0
491	95	0	0	0	0	0
491	97	0	0	0	0	0
491	96	0	0	0	0	0
491	98	0	0	0	0	0
491	8	0	0	0	0	0
491	108	0	0	0	1	0
491	108b	0	0	0	0	0

SITE ID	GRAVE #	TRAUMA-NASALS	TRAUMA-FACIAL	TRAUMA-LONG BONES	TRAUMA-OTHER	WEAPON WOUNDS
491	7b	0	0	0	0	0
491	144	0	0	0	0	0
491	140	0	0	0	0	0
491	139	0	0	0	0	0
491	155	0	0	0	0	0
491	150	0	0	0	0	0
491	156	0	0	0	0	0
491	159	0	0	0	0	0
491	160	0	0	0	0	0
491	165	0	0	0	0	0
491	164	0	0	0	0	0
491	146	0	0	0	0	0
491	158	0	0	0	0	0
491	163	0	0	0	0	0
491	161	0	0	0	0	0
491	162	0	0	0	0	0
491	157	0	0	0	0	0
491	161a	0	0	0	0	0
526	7	0	0	0	0	0
526	10	0	0	0	0	0
526	4	0	0	0	0	0
526	12	0	0	0	0	0
526	0	0	0	0	0	0
526	11	0	0	0	0	0
526	1	0	0	0	0	0
526	3	0	0	0	0	0
526	5	0	0	0	0	0
526	2	0	0	0	0	0
526	9	0	0	0	0	0
526	13	0	0	0	0	0
526	15	0	0	0	0	0
526	UNK	0	0	0	0	0
533	2	0	0	0	0	0
533	1	0	0	0	0	0
533	7	0	0	0	0	0

SITE ID	GRAVE #	TRAUMA-NASALS	TRAUMA-FACIAL	TRAUMA-LONG BONES	TRAUMA-OTHER	WEAPON WOUNDS
533	9	0	0	0	0	0
533	8	0	0	0	0	0
533	4a	0	0	0	0	0
533	4b	0	0	0	0	0
533	6	0	0	0	0	0
533	3	0	0	0	0	0
533	10	0	0	0	0	0

SITE ID	GRAVE #	PERIO?	PERIO-L CLAV	PERIO-R CLAV	PERIO-L HUM	PERIO-R HUM	PERIO-L ULNA
491	24	0	0	0	0	0	0
491	46	1	1	1	1	1	1
491	67	0	0	0	0	0	0
491	67a	0	0	0	0	0	0
491	31	0	0	0	0	0	0
491	27a	1	0	0	0	1	0
491	25	0	0	0	0	0	0
491	33	1	1	1	1	1	1
491	35	1	1	1	1	1	1
491	49	1	1	0	1	0	1
491	47	1	1	1	1	1	3
491	34	0	0	0	0	0	0
491	68	1	1	1	1	1	1
491	64	1	1	1	1	1	0
491	89	1	0	0	0	0	0
491	69	0	0	0	0	0	0
491	73	0	0	0	0	0	0
491	80	1	0	0	0	0	0
491	70/71	0	0	0	0	0	0
491	71	0	0	0	0	0	0
491	70	0	0	0	0	0	0
491	41	0	0	0	0	0	0
491	42	1	4	4	1	1	0
491	44	0	0	0	0	0	0
491	86a	0	0	0	0	0	0

SITE ID	GRAVE #	PERIO?	PERIO-L CLAV	PERIO-R CLAV	PERIO-L HUM	PERIO-R HUM	PERIO-L ULNA
491	86b	1	0	0	0	0	0
491	84	0	0	0	0	0	0
491	61	0	0	0	0	0	0
491	48	0	0	0	0	0	0
491	85	0	0	0	0	0	0
491	72	0	0	0	0	0	0
491	76	0	0	0	0	0	0
491	82a	0	0	0	0	0	0
491	101	0	0	0	0	0	0
491	77	0	0	0	0	0	0
491	114	1	1	1	1	1	1
491	117	0	0	0	0	0	0
491	82	0	0	0	0	0	0
491	75	0	0	0	0	0	0
491	105	0	0	0	0	0	0
491	62	0	0	0	0	0	0
491	45	0	0	0	0	0	0
491	0	0	0	0	0	0	0
491	1	0	0	0	0	0	0
491	2	0	0	0	0	0	0
491	3	0	0	0	0	0	0
491	4	0	0	0	0	0	0
491	5	1	1	1	1	0	1
491	9	0	0	0	0	0	0
491	10	0	0	0	0	0	0
491	11	0	0	0	0	0	0
491	12	0	0	0	0	0	0
491	15	0	0	0	0	0	0
491	16	0	0	0	0	0	0
491	17	0	0	0	0	0	0
491	18	1	1	1	1	1	1
491	19	0	0	0	0	0	0
491	20	1	0	1	0	1	0
491	7	0	0	0	0	0	0
491	21	0	0	0	0	0	0

SITE ID	GRAVE #	PERIO?	PERIO-L CLAV	PERIO-R CLAV	PERIO-L HUM	PERIO-R HUM	PERIO-L ULNA
491	22	1	1	1	1	1	1
491	22a	0	0	0	0	0	0
491	27	0	0	0	0	0	0
491	28	0	0	0	0	0	0
491	29	0	0	0	0	0	0
491	30	0	0	0	0	0	0
491	32	0	0	0	0	0	0
491	33a	0	0	0	0	0	0
491	34a	0	0	0	0	0	0
491	36	0	0	0	0	0	0
491	37	1	0	0	0	0	0
491	38	0	0	0	0	0	0
491	39	1	1	1	1	1	1
491	40	1	1	1	1	0	1
491	43	0	0	0	0	0	0
491	50	1	1	1	0	0	0
491	51	0	0	0	0	0	0
491	52	0	0	0	0	0	0
491	53	0	0	0	0	0	0
491	54	0	0	0	0	0	0
491	55	0	0	0	0	0	0
491	57	0	0	0	0	0	0
491	58	1	1	1	0	1	0
491	58a	0	0	0	0	0	0
491	59	0	0	0	0	0	0
491	60	1	1	1	1	1	1
491	63	0	0	0	0	0	0
491	65	0	0	0	0	0	0
491	66	0	0	0	0	0	0
491	72a	0	0	0	0	0	0
491	78	1	0	0	0	0	0
491	79	0	0	0	0	0	0
491	81	0	0	0	0	0	0
491	83	0	0	0	0	0	0
491	86c	1	0	1	1	1	1

SITE ID	GRAVE #	PERIO?	PERIO-L CLAV	PERIO-R CLAV	PERIO-L HUM	PERIO-R HUM	PERIO-L ULNA
491	87	0	0	0	0	0	0
491	88	1	0	0	0	0	0
491	100	0	0	0	0	0	0
491	106	0	0	0	0	0	0
491	107	0	0	0	0	0	0
491	108a	1	0	0	0	0	0
491	109	0	0	0	0	0	0
491	109a	0	0	0	0	0	0
491	110	0	0	0	0	0	0
491	111	1	0	0	0	0	0
491	111a	0	0	0	0	0	0
491	112	1	0	0	0	0	0
491	115	0	0	0	0	0	0
491	116	0	0	0	0	0	0
491	118	0	0	0	0	0	0
491	119	0	0	0	0	0	0
491	120	0	0	0	0	0	0
491	121	0	0	0	0	0	0
491	122	0	0	0	0	0	0
491	123	0	0	0	0	0	0
491	123a	0	0	0	0	0	0
491	124	0	0	0	0	0	0
491	125	0	0	0	0	0	0
491	126	0	0	0	0	0	0
491	127	1	0	1	0	0	0
491	128	1	0	0	1	1	1
491	128a	1	0	0	0	0	0
491	129	0	0	0	0	0	0
491	130	1	0	0	0	0	0
491	131	0	0	0	0	0	0
491	132	0	0	0	0	0	0
491	133	0	0	0	0	0	0
491	134	0	0	0	0	0	0
491	136	1	0	1	0	1	1
491	137	0	0	0	0	0	0

SITE ID	GRAVE #	PERIO?	PERIO-L CLAV	PERIO-R CLAV	PERIO-L HUM	PERIO-R HUM	PERIO-L ULNA
491	138	0	0	0	0	0	0
491	138a	0	0	0	0	0	0
491	104	0	0	0	0	0	0
491	102	0	0	0	0	0	0
491	13	0	0	0	0	0	0
491	5a	1	0	0	1	0	1
491	135a	0	0	0	0	0	0
491	135b	0	0	0	0	0	0
491	135c	0	0	0	0	0	0
491	99	0	0	0	0	0	0
491	95	0	0	0	0	0	0
491	97	0	0	0	0	0	0
491	96	0	0	0	0	0	0
491	98	0	0	0	0	0	0
491	8	0	0	0	0	0	0
491	108	0	0	0	0	0	0
491	108b	1	0	0	0	0	0
491	7b	0	0	0	0	0	0
491	144	0	0	0	0	0	0
491	140	1	0	1	0	1	1
491	139	1	0	1	0	1	0
491	155	0	0	0	0	0	0
491	150	0	0	0	0	0	0
491	156	0	0	0	0	0	0
491	159	0	0	0	0	0	0
491	160	0	0	0	0	0	0
491	165	1	0	0	0	0	0
491	164	0	0	0	0	0	0
491	146	0	0	0	0	0	0
491	158	0	0	0	0	0	0
491	163	0	0	0	0	0	0
491	161	0	0	0	0	0	0
491	162	0	0	0	0	0	0
491	157	0	0	0	0	0	0
491	161a	0	0	0	0	0	0

SITE ID	GRAVE #	PERIO?	PERIO-L CLAV	PERIO-R CLAV	PERIO-L HUM	PERIO-R HUM	PERIO-L ULNA
526	7	0	0	0	0	0	0
526	10	1	0	1	1	1	1
526	4	1	1	1	1	1	1
526	12	0	0	0	0	0	0
526	0	0	0	0	0	0	0
526	11	1	0	0	0	0	0
526	1	0	0	0	0	0	0
526	3	1	0	0	0	0	0
526	5	1	1	1	1	1	1
526	2	0	0	0	0	0	0
526	9	0	0	0	0	0	0
526	13	0	0	0	0	0	0
526	15	1	0	0	0	0	0
526	UNK	0	0	0	0	0	0
533	2	0	0	0	0	0	0
533	1	0	0	0	0	0	0
533	7	0	0	0	0	0	0
533	9	0	0	0	0	0	0
533	8	0	0	0	0	0	0
533	4a	0	0	0	0	0	0
533	4b	0	0	0	0	0	0
533	6	0	0	0	0	0	0
533	3	0	0	0	0	0	0
533	10	0	0	0	0	0	0

SITE ID	GRAVE #	PERIO-R ULNA	PERIO-L RAD	PERIO-R RAD	PERIO-L FEM	PERIO-R FEM	PERIO-L TIB
491	24	0	0	0	0	0	0
491	46	1	1	1	1	1	2
491	67	0	0	0	0	0	0
491	67a	0	0	0	0	0	0
491	31	0	0	0	0	0	0
491	27a	0	0	0	0	0	2
491	25	0	0	0	0	0	0
491	33	1	1	1	0	1	2
491	35	1	1	1	1	1	2

SITE ID	GRAVE #	PERIO-R ULNA	PERIO-L RAD	PERIO-R RAD	PERIO-L FEM	PERIO-R FEM	PERIO-L TIB
491	49	0	1	0	1	0	3
491	47	1	3	1	3	1	4
491	34	0	0	0	0	0	0
491	68	1	1	1	1	1	2
491	64	0	0	0	1	1	0
491	89	0	0	0	1	0	2
491	69	0	0	0	0	0	0
491	73	0	0	0	0	0	0
491	80	0	0	0	0	1	0
491	70/71	0	0	0	0	0	0
491	71	0	0	0	0	0	0
491	70	0	0	0	0	0	0
491	41	0	0	0	0	0	0
491	42	0	0	0	0	0	1
491	44	0	0	0	0	0	0
491	86a	0	0	0	0	0	0
491	86b	0	0	1	1	1	3
491	84	0	0	0	0	0	0
491	61	0	0	0	0	0	0
491	48	0	0	0	0	0	0
491	85	0	0	0	0	0	0
491	72	0	0	0	0	0	0
491	76	0	0	0	0	0	0
491	82a	0	0	0	0	0	0
491	101	0	0	0	0	0	0
491	77	0	0	0	0	0	0
491	114	1	1	1	1	1	2
491	117	0	0	0	0	0	0
491	82	0	0	0	0	0	0
491	75	0	0	0	0	0	0
491	105	0	0	0	0	0	0
491	62	0	0	0	0	0	0
491	45	0	0	0	0	0	0
491	0	0	0	0	0	0	0
491	1	0	0	0	0	0	0

SITE ID	GRAVE #	PERIO-R ULNA	PERIO-L RAD	PERIO-R RAD	PERIO-L FEM	PERIO-R FEM	PERIO-L TIB
491	2	0	0	0	0	0	0
491	3	0	0	0	0	0	0
491	4	0	0	0	0	0	0
491	5	0	1	0	1	1	4
491	9	0	0	0	0	0	0
491	10	0	0	0	0	0	0
491	11	0	0	0	0	0	0
491	12	0	0	0	0	0	0
491	15	0	0	0	0	0	0
491	16	0	0	0	0	0	0
491	17	0	0	0	0	0	0
491	18	1	1	1	1	1	1
491	19	0	0	0	0	0	0
491	20	1	0	1	0	1	5
491	7	0	0	0	0	0	0
491	21	0	0	0	0	0	0
491	22	1	1	1	1	1	3
491	22a	0	0	0	0	0	0
491	27	0	0	0	0	0	0
491	28	0	0	0	0	0	0
491	29	0	0	0	0	0	0
491	30	0	0	0	0	0	0
491	32	0	0	0	0	0	0
491	33a	0	0	0	0	0	0
491	34a	0	0	0	0	0	0
491	36	0	0	0	0	0	0
491	37	0	0	0	0	0	1
491	38	0	0	0	0	0	0
491	39	1	1	1	0	0	2
491	40	0	1	0	1	0	3
491	43	0	0	0	0	0	0
491	50	0	0	1	1	1	3
491	51	0	0	0	0	0	0
491	52	0	0	0	0	0	0
491	53	0	0	0	0	0	0

SITE ID	GRAVE #	PERIO-R ULNA	PERIO-L RAD	PERIO-R RAD	PERIO-L FEM	PERIO-R FEM	PERIO-L TIB
491	54	0	0	0	0	0	0
491	55	0	0	0	0	0	0
491	57	0	0	0	0	0	0
491	58	1	0	1	0	1	2
491	58a	0	0	0	0	0	0
491	59	0	0	0	0	0	0
491	60	1	1	1	1	1	2
491	63	0	0	0	0	0	0
491	65	0	0	0	0	0	0
491	66	0	0	0	0	0	0
491	72a	0	0	0	0	0	0
491	78	0	0	0	1	0	2
491	79	0	0	0	0	0	0
491	81	0	0	0	0	0	0
491	83	0	0	0	0	0	0
491	86c	0	0	0	1	1	3
491	87	0	0	0	0	0	0
491	88	0	0	0	0	0	2
491	100	0	0	0	0	0	0
491	106	0	0	0	0	0	0
491	107	0	0	0	0	0	0
491	108a	0	0	0	1	1	2
491	109	0	0	0	0	0	0
491	109a	0	0	0	0	0	0
491	110	0	0	0	0	0	0
491	111	0	0	0	2	2	4
491	111a	0	0	0	0	0	0
491	112	2	0	2	0	2	3
491	115	0	0	0	0	0	0
491	116	0	0	0	0	0	0
491	118	0	0	0	0	0	0
491	119	0	0	0	0	0	0
491	120	0	0	0	0	0	0
491	121	0	0	0	0	0	0
491	122	0	0	0	0	0	0
491	123	0	0	0	0	0	0
491	123a	0	0	0	0	0	0

SITE ID	GRAVE #	PERIO- R ULNA	PERIO- L RAD	PERIO- R RAD	PERIO- L FEM	PERIO- R FEM	PERIO- L TIB
491	124	0	0	0	0	0	0
491	125	0	0	0	0	0	0
491	126	0	0	0	0	0	0
491	127	1	0	1	0	1	0
491	128	1	1	1	1	1	2
491	128a	0	0	0	0	1	0
491	129	0	0	0	0	0	0
491	130	1	0	1	1	1	2
491	131	0	0	0	0	0	0
491	132	0	0	0	0	0	0
491	133	0	0	0	0	0	0
491	134	0	0	0	0	0	0
491	136	1	1	1	1	2	2
491	137	0	0	0	0	0	0
491	138	0	0	0	0	0	0
491	138a	0	0	0	0	0	0
491	104	0	0	0	0	0	0
491	102	0	0	0	0	0	0
491	13	0	0	0	0	0	0
491	5a	1	1	1	1	0	4
491	135a	0	0	0	0	0	0
491	135b	0	0	0	0	0	0
491	135c	0	0	0	0	0	0
491	99	0	0	0	0	0	0
491	95	0	0	0	0	0	0
491	97	0	0	0	0	0	0
491	96	0	0	0	0	0	0
491	98	0	0	0	0	0	0
491	8	0	0	0	0	0	0
491	108	0	0	0	0	0	0
491	108b	0	0	0	1	0	3
491	7b	0	0	0	0	0	0
491	144	0	0	0	0	0	0
491	140	0	1	0	1	1	4
491	139	1	0	1	0	1	3
491	155	0	0	0	0	0	0

SITE ID	GRAVE #	PERIO-R ULNA	PERIO-L RAD	PERIO-R RAD	PERIO-L FEM	PERIO-R FEM	PERIO-L TIB
491	150	0	0	0	0	0	0
491	156	0	0	0	0	0	0
491	159	0	0	0	0	0	0
491	160	0	0	0	0	0	0
491	165	0	0	0	1	1	2
491	164	0	0	0	0	0	0
491	146	0	0	0	0	0	0
491	158	0	0	0	0	0	0
491	163	0	0	0	0	0	0
491	161	0	0	0	0	0	0
491	162	0	0	0	0	0	0
491	157	0	0	0	0	0	0
491	161a	0	0	0	0	0	0
526	7	0	0	0	0	0	0
526	10	1	1	1	1	1	3
526	4	1	1	1	1	1	2
526	12	0	0	0	0	0	0
526	0	0	0	0	0	0	0
526	11	0	0	0	0	0	3
526	1	0	0	0	0	0	0
526	3	0	0	0	1	0	2
526	5	0	1	0	1	1	2
526	2	0	0	0	0	0	0
526	9	0	0	0	0	0	0
526	13	0	0	0	0	0	0
526	15	1	0	0	0	1	2
526	UNK	0	0	0	0	0	0
533	2	0	0	0	0	0	0
533	1	0	0	0	0	0	0
533	7	0	0	0	0	0	0
533	9	0	0	0	0	0	0
533	8	0	0	0	0	0	0
533	4a	0	0	0	0	0	0
533	4b	0	0	0	0	0	0
533	6	0	0	0	0	0	0
533	3	0	0	0	0	0	0
533	10	0	0	0	0	0	0

SITE ID	GRAVE #	PERIO- R TIB	PERIO- L FIB	PERIO- R FIB	DJD	DJD- TMJ	DJD L SHOULDER
491	24	0	0	0	0	0	0
491	46	3	1	1	2	2	2
491	67	0	0	0	2	1	1
491	67a	0	0	0	0	0	0
491	31	0	0	0	0	0	0
491	27a	2	0	1	0	0	0
491	25	0	0	0	1	0	0
491	33	2	1	1	1	0	1
491	35	2	3	1	2	1	1
491	49	0	1	0	0	0	0
491	47	4	4	4	2	1	1
491	34	0	0	0	0	0	0
491	68	2	1	1	2	1	2
491	64	2	1	1	1	1	1
491	89	0	1	0	2	0	0
491	69	0	0	0	1	1	0
491	73	0	0	0	1	0	0
491	80	0	4	4	1	0	0
491	70/71	0	0	0	1	1	0
491	71	0	0	0	1	1	0
491	70	0	0	0	1	1	0
491	41	0	0	0	0	0	0
491	42	1	0	0	2	2	1
491	44	0	0	0	0	0	0
491	86a	0	0	0	1	1	0
491	86b	3	1	1	0	0	0
491	84	0	0	0	1	0	0
491	61	0	0	0	0	0	0
491	48	0	0	0	0	0	0
491	85	0	0	0	0	0	0
491	72	0	0	0	1	0	0
491	76	0	0	0	0	0	0
491	82a	0	0	0	0	0	0
491	101	0	0	0	0	0	0
491	77	0	0	0	0	0	0
491	114	3	1	1	2	1	1
491	117	0	0	0	1	1	0

SITE ID	GRAVE #	PERIO- R TIB	PERIO- L FIB	PERIO- R FIB	DJD	DJD- TMJ	DJD L SHOULDER
491	82	0	0	0	0	0	0
491	75	0	0	0	0	0	0
491	105	0	0	0	0	0	0
491	62	0	0	0	0	0	0
491	45	0	0	0	0	0	0
491	0	0	0	0	0	0	0
491	1	0	0	0	0	0	0
491	2	0	0	0	1	0	0
491	3	0	0	0	0	0	0
491	4	0	0	0	1	0	1
491	5	3	0	0	1	1	1
491	9	0	0	0	2	1	0
491	10	0	0	0	2	1	2
491	11	0	0	0	1	1	1
491	12	0	0	0	0	0	0
491	15	0	0	0	1	0	0
491	16	0	0	0	1	1	0
491	17	0	0	0	0	0	0
491	18	3	1	1	1	0	1
491	19	0	0	0	1	1	0
491	20	4	5	5	1	1	0
491	7	0	0	0	0	0	0
491	21	0	0	0	1	1	0
491	22	3	0	3	2	0	1
491	22a	0	0	0	1	1	0
491	27	0	0	0	1	1	1
491	28	0	0	0	1	1	0
491	29	0	0	0	0	0	0
491	30	0	0	0	0	0	0
491	32	0	0	0	1	1	0
491	33a	0	0	0	0	0	0
491	34a	0	0	0	0	0	0
491	36	0	0	0	0	0	0
491	37	3	1	1	1	0	0
491	38	0	0	0	2	1	2
491	39	2	1	0	2	1	1
491	40	3	1	4	2	1	1

SITE ID	GRAVE #	PERIO-R TIB	PERIO-L FIB	PERIO-R FIB	DJD	DJD-TMJ	DJD L SHOULDER
491	43	0	0	0	2	1	1
491	50	3	1	1	0	0	0
491	51	0	0	0	0	0	0
491	52	0	0	0	0	0	0
491	53	0	0	0	0	0	0
491	54	0	0	0	2	1	1
491	55	0	0	0	0	0	0
491	57	0	0	0	0	0	0
491	58	2	1	1	2	1	0
491	58a	0	0	0	0	0	0
491	59	0	0	0	0	0	0
491	60	2	1	1	2	1	2
491	63	0	0	0	0	0	0
491	65	0	0	0	0	0	0
491	66	0	0	0	2	1	0
491	72a	0	0	0	0	0	0
491	78	2	1	1	0	0	0
491	79	0	0	0	2	1	2
491	81	0	0	0	0	0	0
491	83	0	0	0	2	1	0
491	86c	3	0	0	0	0	0
491	87	0	0	0	0	0	0
491	88	2	1	1	1	0	0
491	100	0	0	0	0	0	0
491	106	0	0	0	0	0	0
491	107	0	0	0	0	0	0
491	108a	3	0	0	1	0	0
491	109	0	0	0	1	1	1
491	109a	0	0	0	0	0	0
491	110	0	0	0	1	1	0
491	111	5	5	5	1	0	0
491	111a	0	0	0	0	0	0
491	112	3	1	1	0	0	0
491	115	0	0	0	2	1	1
491	116	0	0	0	2	2	2
491	118	0	0	0	2	1	2
491	119	0	0	0	0	0	0

SITE ID	GRAVE #	PERIO-R TIB	PERIO-L FIB	PERIO-R FIB	DJD	DJD-TMJ	DJD L SHOULDER
491	120	0	0	0	0	0	0
491	121	0	0	0	0	0	0
491	122	0	0	0	0	0	0
491	123	0	0	0	0	0	0
491	123a	0	0	0	0	0	0
491	124	0	0	0	1	1	0
491	125	0	0	0	0	0	0
491	126	0	0	0	2	1	0
491	127	3	0	0	0	0	0
491	128	2	1	1	1	1	0
491	128a	3	1	1	0	0	0
491	129	0	0	0	2	0	1
491	130	3	1	1	1	0	0
491	131	0	0	0	0	0	0
491	132	0	0	0	2	1	1
491	133	0	0	0	0	0	0
491	134	0	0	0	0	0	0
491	136	2	1	1	2	0	1
491	137	0	0	0	0	0	0
491	138	0	0	0	2	1	1
491	138a	0	0	0	1	0	1
491	104	0	0	0	0	0	0
491	102	0	0	0	0	0	0
491	13	0	0	0	1	1	0
491	5a	0	3	0	2	0	0
491	135a	0	0	0	0	0	0
491	135b	0	0	0	0	0	0
491	135c	0	0	0	0	0	0
491	99	0	0	0	0	0	0
491	95	0	0	0	0	0	0
491	97	0	0	0	1	0	0
491	96	0	0	0	0	0	0
491	98	0	0	0	0	0	0
491	8	0	0	0	1	1	0
491	108	0	0	0	2	1	1
491	108b	2	1	1	1	1	1
491	7b	0	0	0	1	1	1

SITE ID	GRAVE #	PERIO- R TIB	PERIO- L FIB	PERIO- R FIB	DJD	DJD- TMJ	DJD L SHOULDER
491	144	0	0	0	1	1	1
491	140	2	1	0	2	1	0
491	139	3	1	0	2	1	0
491	155	0	0	0	2	1	1
491	150	0	0	0	0	0	0
491	156	0	0	0	2	1	0
491	159	0	0	0	2	2	0
491	160	0	0	0	2	0	1
491	165	1	1	1	1	0	0
491	164	0	0	0	1	0	0
491	146	0	0	0	1	1	0
491	158	0	0	0	2	0	1
491	163	0	0	0	0	0	0
491	161	0	0	0	1	1	0
491	162	0	0	0	1	0	0
491	157	0	0	0	0	0	0
491	161a	0	0	0	0	0	0
526	7	0	0	0	0	0	0
526	10	4	1	0	0	0	0
526	4	3	1	0	0	0	0
526	12	0	0	0	1	0	0
526	0	0	0	0	1	1	0
526	11	2	1	1	1	0	0
526	1	0	0	0	2	1	1
526	3	0	1	1	2	0	0
526	5	2	1	1	2	2	1
526	2	0	0	0	2	1	1
526	9	0	0	0	0	0	0
526	13	0	0	0	2	0	0
526	15	2	0	1	2	0	0
526	UNK	0	0	0	1	0	0
533	2	0	0	0	2	1	1
533	1	0	0	0	1	0	1
533	7	0	0	0	1	1	0
533	9	0	0	0	1	1	0
533	8	0	0	0	1	1	0
533	4a	0	0	0	1	0	0

SITE ID	GRAVE #	PERIO-R TIB	PERIO-L FIB	PERIO-R FIB	DJD	DJD-TMJ	DJD L SHOULDER
533	4b	0	0	0	0	0	0
533	6	0	0	0	0	0	0
533	3	0	0	0	0	0	0
533	10	0	0	0	1	1	0

SITE ID	GRAVE #	DJD R SHOULDER	DJD L ELBOW	DJD R ELBOW	DJD L HIP	DJD R HIP	DJD L KNEE
491	24	0	0	0	0	0	0
491	46	2	2	3	1	2	2
491	67	1	1	1	1	1	1
491	67a	0	0	0	0	0	0
491	31	0	0	0	0	0	0
491	27a	0	0	1	0	0	0
491	25	0	0	0	0	1	0
491	33	1	1	1	0	1	1
491	35	1	1	1	1	1	1
491	49	0	0	0	0	0	0
491	47	1	2	2	1	1	1
491	34	0	0	0	0	0	0
491	68	1	1	1	1	1	1
491	64	1	1	1	1	1	0
491	89	0	0	0	1	0	0
491	69	0	0	0	1	1	0
491	73	0	0	0	0	0	0
491	80	0	0	0	0	0	0
491	70/71	0	0	0	0	0	0
491	71	0	0	0	0	0	0
491	70	0	0	0	0	0	0
491	41	0	0	0	0	0	0
491	42	1	0	0	0	0	0
491	44	0	0	0	0	0	0
491	86a	1	0	0	0	0	0
491	86b	0	0	0	0	0	0
491	84	0	0	0	0	0	0
491	61	0	0	0	0	0	0
491	48	0	0	0	0	0	0
491	85	0	0	0	0	0	0

SITE ID	GRAVE #	DJD R SHOULDER	DJD L ELBOW	DJD R ELBOW	DJD L HIP	DJD R HIP	DJD L KNEE
491	72	0	0	0	0	0	0
491	76	0	0	0	0	0	0
491	82a	0	0	0	0	0	0
491	101	0	0	0	0	0	0
491	77	0	0	0	0	0	0
491	114	1	1	1	1	1	1
491	117	0	1	0	1	1	1
491	82	0	0	0	0	0	0
491	75	0	0	0	0	0	0
491	105	0	0	0	0	0	0
491	62	0	0	0	0	0	0
491	45	0	0	0	0	0	0
491	0	0	0	0	0	0	0
491	1	0	0	0	0	0	0
491	2	0	1	0	0	0	0
491	3	0	0	0	0	0	0
491	4	0	0	0	1	1	0
491	5	0	0	0	0	0	0
491	9	0	0	0	1	1	0
491	10	2	0	0	1	0	0
491	11	0	0	1	0	1	0
491	12	0	0	0	0	0	0
491	15	0	0	0	0	1	1
491	16	0	0	0	0	0	0
491	17	0	0	0	0	0	0
491	18	1	1	1	1	1	0
491	19	0	0	0	0	0	0
491	20	0	0	1	0	1	1
491	7	0	0	0	0	0	0
491	21	0	1	0	1	1	1
491	22	1	2	2	1	1	1
491	22a	0	0	0	0	0	0
491	27	1	1	1	1	1	1
491	28	0	0	0	0	0	0
491	29	0	0	0	0	0	0
491	30	0	0	0	0	0	0

SITE ID	GRAVE #	DJD R SHOULDER	DJD L ELBOW	DJD R ELBOW	DJD L HIP	DJD R HIP	DJD L KNEE
491	32	0	1	0	1	1	0
491	33a	0	0	0	0	0	0
491	34a	0	0	0	0	0	0
491	36	0	0	0	0	0	0
491	37	0	0	0	0	0	1
491	38	1	1	1	2	1	1
491	39	1	1	1	1	1	1
491	40	1	1	0	1	0	1
491	43	2	1	2	1	1	1
491	50	0	0	0	0	0	0
491	51	0	0	0	0	0	0
491	52	0	0	0	0	0	0
491	53	0	0	0	0	0	0
491	54	2	1	2	1	1	1
491	55	0	0	0	0	0	0
491	57	0	0	0	0	0	0
491	58	3	0	2	0	2	2
491	58a	0	0	0	0	0	0
491	59	0	0	0	0	0	0
491	60	2	0	2	1	1	1
491	63	0	0	0	0	0	0
491	65	0	0	0	0	0	0
491	66	1	1	0	1	1	1
491	72a	0	0	0	0	0	0
491	78	0	0	0	0	0	0
491	79	1	1	2	2	0	0
491	81	0	0	0	0	0	0
491	83	0	0	0	2	1	1
491	86c	0	0	0	0	0	0
491	87	0	0	0	0	0	0
491	88	0	0	0	0	0	1
491	100	0	0	0	0	0	0
491	106	0	0	0	0	0	0
491	107	0	0	0	0	0	0
491	108a	0	0	0	1	1	1
491	109	1	1	1	1	1	0

SITE ID	GRAVE #	DJD R SHOULDER	DJD L ELBOW	DJD R ELBOW	DJD L HIP	DJD R HIP	DJD L KNEE
491	109a	0	0	0	0	0	0
491	110	0	1	0	1	0	0
491	111	0	0	0	1	1	1
491	111a	0	0	0	0	0	0
491	112	0	0	0	0	0	0
491	115	1	0	2	3	3	1
491	116	2	1	1	2	2	1
491	118	1	0	1	0	0	0
491	119	0	0	0	0	0	0
491	120	0	0	0	0	0	0
491	121	0	0	0	0	0	0
491	122	0	0	0	0	0	0
491	123	0	0	0	0	0	0
491	123a	0	0	0	0	0	0
491	124	0	0	0	0	0	0
491	125	0	0	0	0	0	0
491	126	0	1	2	1	1	1
491	127	0	0	0	0	0	0
491	128	0	0	0	0	1	1
491	128a	0	0	0	0	0	0
491	129	1	1	1	1	1	1
491	130	0	0	1	1	1	1
491	131	0	0	0	0	0	0
491	132	1	1	1	1	1	1
491	133	0	0	0	0	0	0
491	134	0	0	0	0	0	0
491	136	1	1	1	1	1	1
491	137	0	0	0	0	0	0
491	138	1	1	1	1	1	1
491	138a	1	1	0	0	1	0
491	104	0	0	0	0	0	0
491	102	0	0	0	0	0	0
491	13	0	0	1	0	0	0
491	5a	0	1	2	1	0	1
491	135a	0	0	0	0	0	0
491	135b	0	0	0	0	0	0

SITE ID	GRAVE #	DJD R SHOULDER	DJD L ELBOW	DJD R ELBOW	DJD L HIP	DJD R HIP	DJD L KNEE
491	135c	0	0	0	0	0	0
491	99	0	0	0	0	0	0
491	95	0	0	0	0	0	0
491	97	0	0	1	0	1	0
491	96	0	0	0	0	0	0
491	98	0	0	0	0	0	0
491	8	0	0	0	0	0	0
491	108	1	1	1	1	1	1
491	108b	0	0	0	1	0	1
491	7b	1	1	1	1	1	1
491	144	0	0	0	0	1	1
491	140	0	1	1	0	1	1
491	139	0	0	0	3	2	1
491	155	1	1	1	1	1	1
491	150	0	0	0	0	0	0
491	156	0	1	1	1	1	0
491	159	0	0	0	0	0	0
491	160	0	1	1	0	1	1
491	165	0	0	0	1	1	1
491	164	0	1	1	1	1	1
491	146	0	0	1	0	0	0
491	158	0	1	0	0	0	1
491	163	0	0	0	0	0	0
491	161	0	0	0	0	0	0
491	162	1	0	1	1	0	0
491	157	0	0	0	0	0	0
491	161a	0	0	0	0	0	0
526	7	0	0	0	0	0	0
526	10	0	0	0	0	0	0
526	4	0	0	0	0	0	0
526	12	0	0	0	0	0	0
526	0	0	0	0	0	0	0
526	11	0	0	0	0	0	1
526	1	1	2	0	1	2	1
526	3	0	0	0	2	0	1
526	5	1	1	0	1	2	1
526	2	1	2	1	1	1	1

SITE ID	GRAVE #	DJD R SHOULDER	DJD L ELBOW	DJD R ELBOW	DJD L HIP	DJD R HIP	DJD L KNEE
526	9	0	0	0	0	0	0
526	13	0	0	0	0	0	1
526	15	0	0	1	2	1	0
526	UNK	0	0	0	0	0	0
533	2	1	1	1	2	2	1
533	1	0	0	0	0	1	0
533	7	0	0	0	0	0	0
533	9	0	1	0	0	0	0
533	8	0	0	1	1	1	0
533	4a	0	0	0	0	0	0
533	4b	0	0	0	0	0	0
533	6	0	0	0	0	0	0
533	3	0	0	0	0	0	0
533	10	0	0	0	0	0	0

SITE ID	GRAVE #	DJD R KNEE	DJD L WRIST	DJD R WRIST	DJD L ANKLE	DJD R ANKLE	DJD CERV VERT
491	24	0	0	0	0	0	0
491	46	3	2	2	1	1	3
491	67	1	1	1	1	1	3
491	67a	0	0	0	0	0	0
491	31	0	0	0	0	0	0
491	27a	1	0	0	0	1	0
491	25	0	0	0	0	0	0
491	33	1	1	1	1	1	1
491	35	1	1	1	1	1	1
491	49	0	0	0	0	0	0
491	47	1	3	1	1	1	1
491	34	0	0	0	0	0	0
491	68	1	1	1	1	1	1
491	64	1	0	0	0	1	0
491	89	0	0	0	1	0	0
491	69	1	0	1	0	1	0
491	73	1	0	0	0	1	0
491	80	1	0	0	1	1	0
491	70/71	0	0	0	0	0	0
491	71	0	0	0	0	0	0

SITE ID	GRAVE #	DJD R KNEE	DJD L WRIST	DJD R WRIST	DJD L ANKLE	DJD R ANKLE	DJD CERV VERT
491	70	0	0	0	0	0	0
491	41	0	0	0	0	0	0
491	42	0	0	0	0	0	1
491	44	0	0	0	0	0	0
491	86a	0	0	0	0	0	0
491	86b	0	0	0	0	0	0
491	84	0	0	0	1	1	0
491	61	0	0	0	0	0	0
491	48	0	0	0	0	0	0
491	85	0	0	0	0	0	0
491	72	1	0	0	0	0	1
491	76	0	0	0	0	0	0
491	82a	0	0	0	0	0	0
491	101	0	0	0	0	0	0
491	77	0	0	0	0	0	0
491	114	1	1	1	1	1	2
491	117	1	1	1	1	1	0
491	82	0	0	0	0	0	0
491	75	0	0	0	0	0	0
491	105	0	0	0	0	0	0
491	62	0	0	0	0	0	0
491	45	0	0	0	0	0	0
491	0	0	0	0	0	0	0
491	1	0	0	0	0	0	0
491	2	0	0	0	0	0	0
491	3	0	0	0	0	0	0
491	4	0	0	0	0	0	1
491	5	0	0	0	0	0	1
491	9	1	0	0	0	0	1
491	10	0	0	0	0	0	1
491	11	1	0	0	1	0	0
491	12	0	0	0	0	0	0
491	15	1	0	0	0	0	0
491	16	0	0	0	0	0	0
491	17	0	0	0	0	0	0
491	18	1	1	0	1	1	1

SITE ID	GRAVE #	DJD R KNEE	DJD L WRIST	DJD R WRIST	DJD L ANKLE	DJD R ANKLE	DJD CERV VERT
491	19	0	0	0	0	0	0
491	20	1	0	0	1	1	1
491	7	0	0	0	0	0	0
491	21	1	0	1	1	1	1
491	22	0	1	0	0	0	0
491	22a	0	0	0	0	0	0
491	27	1	1	1	1	1	1
491	28	0	0	0	0	0	0
491	29	0	0	0	0	0	0
491	30	0	0	0	0	0	0
491	32	1	1	0	0	0	1
491	33a	0	0	0	0	0	0
491	34a	0	0	0	0	0	0
491	36	0	0	0	0	0	0
491	37	1	0	0	1	1	0
491	38	1	1	1	0	0	1
491	39	0	1	1	1	1	0
491	40	1	1	0	1	1	1
491	43	1	1	1	1	1	1
491	50	0	0	0	0	0	0
491	51	0	0	0	0	0	0
491	52	0	0	0	0	0	0
491	53	0	0	0	0	0	0
491	54	1	1	1	1	1	3
491	55	0	0	0	0	0	0
491	57	0	0	0	0	0	0
491	58	3	0	3	3	2	3
491	58a	0	0	0	0	0	0
491	59	0	0	0	0	0	0
491	60	1	0	1	2	1	3
491	63	0	0	0	0	0	0
491	65	0	0	0	0	0	0
491	66	1	1	1	1	1	1
491	72a	0	0	0	0	0	0
491	78	0	0	0	0	0	0
491	79	0	0	1	0	0	2

SITE ID	GRAVE #	DJD R KNEE	DJD L WRIST	DJD R WRIST	DJD L ANKLE	DJD R ANKLE	DJD CERV VERT
491	81	0	0	0	0	0	0
491	83	1	1	0	1	0	0
491	86c	0	0	0	0	0	0
491	87	0	0	0	0	0	0
491	88	1	0	0	0	0	0
491	100	0	0	0	0	0	0
491	106	0	0	0	0	0	0
491	107	0	0	0	0	0	0
491	108a	1	0	0	1	1	0
491	109	0	0	1	0	0	1
491	109a	0	0	0	0	0	0
491	110	0	1	1	0	0	1
491	111	1	0	0	1	1	0
491	111a	0	0	0	0	0	0
491	112	0	0	0	0	0	0
491	115	1	0	0	1	1	1
491	116	1	1	1	1	1	1
491	118	0	0	1	0	0	0
491	119	0	0	0	0	0	0
491	120	0	0	0	0	0	0
491	121	0	0	0	0	0	0
491	122	0	0	0	0	0	0
491	123	0	0	0	0	0	0
491	123a	0	0	0	0	0	0
491	124	0	0	0	0	0	0
491	125	0	0	0	0	0	0
491	126	1	1	1	1	1	2
491	127	0	0	0	0	0	0
491	128	1	0	1	1	1	0
491	128a	0	0	0	0	0	0
491	129	1	1	1	2	1	2
491	130	1	0	1	1	1	0
491	131	0	0	0	0	0	0
491	132	1	1	1	1	1	1
491	133	0	0	0	0	0	0
491	134	0	0	0	0	0	0

SITE ID	GRAVE #	DJD R KNEE	DJD L WRIST	DJD R WRIST	DJD L ANKLE	DJD R ANKLE	DJD CERV VERT
491	136	1	1	1	1	1	1
491	137	0	0	0	0	1	0
491	138	1	1	1	1	1	1
491	138a	0	0	0	0	0	0
491	104	0	0	0	0	0	0
491	102	0	0	0	0	0	0
491	13	0	0	0	0	0	0
491	5a	0	0	1	0	0	0
491	135a	0	0	0	0	0	0
491	135b	0	0	0	0	0	0
491	135c	0	0	0	0	0	0
491	99	0	0	0	0	0	0
491	95	0	0	0	0	0	0
491	97	0	1	1	0	0	1
491	96	0	0	0	0	0	0
491	98	0	0	0	0	0	0
491	8	0	0	0	0	0	0
491	108	1	1	1	0	0	1
491	108b	0	0	0	1	1	1
491	7b	1	1	1	1	1	1
491	144	1	0	0	1	1	0
491	140	1	0	0	1	1	0
491	139	1	0	0	1	1	0
491	155	1	0	0	1	1	1
491	150	0	0	0	0	0	0
491	156	1	1	0	0	0	1
491	159	0	0	0	0	0	1
491	160	1	0	1	3	1	0
491	165	1	0	0	1	1	0
491	164	1	1	1	1	0	0
491	146	0	0	0	0	0	1
491	158	2	0	0	1	1	0
491	163	0	0	0	0	0	0
491	161	0	0	0	1	0	1
491	162	0	0	0	0	0	0
491	157	0	0	0	0	0	0

SITE ID	GRAVE #	DJD R KNEE	DJD L WRIST	DJD R WRIST	DJD L ANKLE	DJD R ANKLE	DJD CERV VERT
491	161a	0	0	0	0	0	0
526	7	0	0	0	0	0	0
526	10	0	0	0	0	0	0
526	4	0	0	0	0	0	0
526	12	0	0	0	1	1	0
526	0	0	0	0	0	0	0
526	11	1	0	0	1	1	0
526	1	1	2	0	1	1	3
526	3	0	0	0	0	0	0
526	5	1	1	0	1	1	0
526	2	1	1	1	1	1	1
526	9	0	0	0	0	0	0
526	13	1	0	0	0	0	0
526	15	1	0	0	0	0	0
526	UNK	0	0	0	0	0	1
533	2	1	0	1	1	1	0
533	1	0	0	0	0	0	0
533	7	0	0	0	0	0	0
533	9	0	0	0	0	0	0
533	8	0	0	0	0	0	1
533	4a	0	0	0	0	0	1
533	4b	0	0	0	0	0	0
533	6	0	0	0	0	0	0
533	3	0	0	0	0	0	0
533	10	0	0	0	0	0	0

SITE ID	GRAVE #	DJD THOR VERT	DJD LUM VERT	TB-VERTS	#RIB - TB	CARIES SICCA
491	24	0	0	0	.	0
491	46	2	3	1	0	1
491	67	3	3	1	0	1
491	67a	0	0	1	0	1
491	31	0	0	0	0	1
491	27a	0	0	0	.	0
491	25	0	0	0	.	0
491	33	1	1	1	0	1

SITE ID	GRAVE #	DJD THOR VERT	DJD LUM VERT	TB-VERTS	#RIB - TB	CARIES SICCA
491	35	2	2	1	0	1
491	49	0	0	1	0	1
491	47	2	1	1	0	1
491	34	0	0	0	0	1
491	68	2	3	1	0	1
491	64	1	1	1	0	1
491	89	0	2	1	0	0
491	69	0	0	0	.	1
491	73	0	0	0	.	0
491	80	0	0	0	.	0
491	70/71	0	0	0	0	0
491	71	0	0	0	.	1
491	70	0	0	0	.	1
491	41	0	0	1	0	1
491	42	1	0	1	2	1
491	44	0	0	1	0	1
491	86a	0	1	1	.	1
491	86b	0	0	1	0	0
491	84	0	0	0	.	0
491	61	0	0	1	0	1
491	48	0	0	1	0	1
491	85	0	0	1	0	1
491	72	1	1	1	0	1
491	76	0	0	0	.	1
491	82a	0	0	1	0	0
491	101	0	0	0	.	1
491	77	0	0	0	0	1
491	114	1	1	1	0	1
491	117	0	0	0	0	1
491	82	0	0	1	0	1
491	75	0	0	1	0	0
491	105	0	0	0	.	0
491	62	0	0	0	0	1
491	45	0	0	1	0	1
491	0	0	0	0	.	1

SITE ID	GRAVE #	DJD THOR VERT	DJD LUM VERT	TB-VERTS	#RIB - TB	CARIES SICCA
491	1	0	0	1	0	0
491	2	0	0	0	.	1
491	3	0	0	0	0	0
491	4	1	2	1	0	0
491	5	1	0	1	0	1
491	9	1	3	1	0	1
491	10	2	0	1	0	0
491	11	1	1	1	0	1
491	12	0	0	1	0	1
491	15	0	0	0	.	0
491	16	0	0	0	.	1
491	17	0	0	1	0	1
491	18	1	0	1	0	0
491	19	0	0	0	.	1
491	20	1	0	1	0	1
491	7	0	0	0	0	1
491	21	0	0	0	0	1
491	22	0	0	1	0	0
491	22a	0	0	0	.	0
491	27	1	1	1	0	1
491	28	0	0	0	.	1
491	29	0	0	0	.	1
491	30	0	0	0	.	0
491	32	1	1	1	0	1
491	33a	0	0	0	.	0
491	34a	0	0	0	.	0
491	36	0	0	0	0	1
491	37	0	0	0	.	0
491	38	1	1	1	0	1
491	39	2	3	1	0	1
491	40	1	2	1	0	1
491	43	0	0	0	0	1
491	50	0	0	1	0	1
491	51	0	0	0	.	1
491	52	0	0	0	0	1

SITE ID	GRAVE #	DJD THOR VERT	DJD LUM VERT	TB-VERTS	#RIB - TB	CARIES SICCA
491	53	0	0	0	.	0
491	54	2	3	1	0	1
491	55	0	0	1	0	0
491	57	0	0	0	0	1
491	58	2	3	1	0	1
491	58a	0	0	0	0	0
491	59	0	0	0	.	1
491	60	3	3	1	0	1
491	63	0	0	1	0	1
491	65	0	0	0	0	1
491	66	2	3	1	0	1
491	72a	0	0	0	.	0
491	78	0	0	0	.	0
491	79	3	2	1	0	1
491	81	0	0	0	0	1
491	83	2	1	1	0	0
491	86c	0	0	1	0	0
491	87	0	0	1	0	1
491	88	0	0	0	.	0
491	100	0	0	1	0	1
491	106	0	0	1	0	1
491	107	0	0	1	0	1
491	108a	0	0	0	0	0
491	109	1	1	1	0	1
491	109a	0	0	0	.	1
491	110	1	1	1	0	1
491	111	0	0	0	.	0
491	111a	0	0	1	0	0
491	112	0	0	0	.	0
491	115	1	3	1	0	1
491	116	1	1	1	0	1
491	118	2	0	1	0	1
491	119	0	0	0	0	1
491	120	0	0	1	0	1
491	121	0	0	0	0	1

SITE ID	GRAVE #	DJD THOR VERT	DJD LUM VERT	TB-VERTS	#RIB - TB	CARIES SICCA
491	122	0	0	1	0	1
491	123	0	0	1	0	1
491	123a	0	0	0	0	0
491	124	0	0	0	.	1
491	125	0	0	0	.	1
491	126	2	2	1	0	1
491	127	0	0	0	0	0
491	128	0	0	0	.	1
491	128a	0	0	0	.	0
491	129	2	2	1	0	0
491	130	1	1	1	0	0
491	131	0	0	0	0	1
491	132	1	2	1	0	1
491	133	0	0	0	0	1
491	134	0	0	1	0	1
491	136	1	2	1	0	0
491	137	0	0	0	.	0
491	138	1	3	1	0	1
491	138a	0	0	0	0	0
491	104	0	0	1	0	1
491	102	0	0	0	0	1
491	13	0	0	0	0	0
491	5a	0	0	0	.	0
491	135a	0	0	0	.	1
491	135b	0	0	0	.	1
491	135c	0	0	0	.	1
491	99	0	0	0	.	0
491	95	0	0	0	0	0
491	97	1	1	1	0	0
491	96	0	0	0	0	1
491	98	0	0	0	0	1
491	8	0	0	0	.	1
491	108	2	3	1	0	1
491	108b	1	0	1	.	1
491	7b	1	1	1	0	1

SITE ID	GRAVE #	DJD THOR VERT	DJD LUM VERT	TB-VERTS	#RIB - TB	CARIES SICCA
491	144	0	1	1	0	1
491	140	1	2	1	0	1
491	139	3	3	1	0	1
491	155	1	2	1	0	1
491	150	0	0	1	0	1
491	156	2	1	1	0	1
491	159	1	0	1	0	1
491	160	2	3	1	0	0
491	165	0	0	0	0	0
491	164	1	1	1	0	0
491	146	1	0	1	0	1
491	158	1	0	1	0	0
491	163	0	0	0	0	0
491	161	0	0	0	0	1
491	162	0	0	0	0	1
491	157	0	0	0	0	1
491	161a	0	0	0	.	1
526	7	0	0	0	0	0
526	10	0	0	1	0	1
526	4	0	0	1	0	1
526	12	0	0	0	.	0
526	0	0	0	0	.	1
526	11	0	0	0	.	0
526	1	2	2	1	0	1
526	3	0	0	0	.	0
526	5	1	2	1	0	0
526	2	1	1	1	0	1
526	9	0	0	1	0	1
526	13	0	2	1	.	1
526	15	0	0	0	0	0
526	UNK	0	0	0	.	1
533	2	0	0	1	0	0
533	1	0	1	1	.	1
533	7	0	0	0	.	1
533	9	0	0	0	.	1

SITE ID	GRAVE #	DJD THOR VERT	DJD LUM VERT	TB-VERTS	#RIB - TB	CARIES SICCA
533	8	0	0	0	0	1
533	4a	0	0	0	0	0
533	4b	0	0	0	.	0
533	6	0	0	0	.	1
533	3	0	0	1	0	1
533	10	0	0	0	.	1

SITE ID	GRAVE #	NASO-PHARYNGEAL LESIONS	LEPROSY-HAND	LEPROSY-FOOT
491	24	0	0	0
491	46	1	1	1
491	67	1	1	1
491	67a	0	0	0
491	31	0	1	0
491	27a	0	0	0
491	25	0	0	0
491	33	2	1	1
491	35	1	1	1
491	49	1	1	0
491	47	1	1	2
491	34	1	1	0
491	68	1	1	1
491	64	1	1	1
491	89	0	1	1
491	69	1	1	1
491	73	0	0	1
491	80	0	0	1
491	70/71	0	0	0
491	71	1	0	0
491	70	0	0	0
491	41	1	1	0
491	42	1	0	1
491	44	1	1	0
491	86a	1	0	0
491	86b	0	1	1

SITE ID	GRAVE #	NASO-PHARYNGEAL LESIONS	LEPROSY-HAND	LEPROSY-FOOT
491	84	0	0	1
491	61	1	1	1
491	48	1	1	0
491	85	1	0	0
491	72	0	0	0
491	76	1	0	0
491	82a	0	0	0
491	101	0	0	0
491	77	0	1	0
491	114	1	1	0
491	117	1	1	1
491	82	1	1	1
491	75	1	1	1
491	105	0	0	0
491	62	0	1	0
491	45	0	1	0
491	0	1	0	0
491	1	0	1	1
491	2	0	0	1
491	3	0	0	0
491	4	0	0	1
491	5	1	0	1
491	9	0	1	0
491	10	0	1	0
491	11	1	1	1
491	12	1	0	0
491	15	0	0	0
491	16	0	0	0
491	17	1	0	0
491	18	0	1	1
491	19	1	0	0
491	20	0	0	2
491	7	1	0	1
491	21	1	1	1
491	22	0	1	0

SITE ID	GRAVE #	NASO-PHARYNGEAL LESIONS	LEPROSY-HAND	LEPROSY-FOOT
491	22a	0	0	0
491	27	1	1	1
491	28	1	0	0
491	29	0	0	0
491	30	0	0	0
491	32	1	1	0
491	33a	0	0	1
491	34a	0	0	0
491	36	0	0	0
491	37	0	1	1
491	38	1	1	0
491	39	1	1	0
491	40	1	1	2
491	43	0	1	1
491	50	1	1	0
491	51	1	0	0
491	52	1	0	0
491	53	0	0	1
491	54	1	1	1
491	55	1	1	0
491	57	0	0	1
491	58	1	1	1
491	58a	0	0	0
491	59	0	0	0
491	60	0	1	1
491	63	1	0	1
491	65	1	0	0
491	66	0	1	1
491	72a	0	0	0
491	78	0	0	1
491	79	1	1	0
491	81	0	1	1
491	83	0	1	1
491	86c	0	0	0
491	87	0	1	1

SITE ID	GRAVE #	NASO-PHARYNGEAL LESIONS	LEPROSY-HAND	LEPROSY-FOOT
491	88	0	0	1
491	100	1	0	1
491	106	1	1	1
491	107	1	0	1
491	108a	0	0	0
491	109	1	1	1
491	109a	0	0	0
491	110	1	1	0
491	111	0	2	2
491	111a	0	0	0
491	112	0	0	0
491	115	1	1	1
491	116	1	1	1
491	118	1	0	0
491	119	0	0	0
491	120	0	0	1
491	121	0	0	0
491	122	1	1	1
491	123	1	1	0
491	123a	0	0	0
491	124	0	0	0
491	125	0	0	0
491	126	1	1	1
491	127	0	0	0
491	128	0	0	1
491	128a	0	0	0
491	129	0	1	1
491	130	0	0	1
491	131	0	0	0
491	132	1	1	1
491	133	1	0	0
491	134	0	0	1
491	136	0	1	1
491	137	0	0	1
491	138	1	1	1

SITE ID	GRAVE #	NASO-PHARYNGEAL LESIONS	LEPROSY-HAND	LEPROSY-FOOT
491	138a	0	1	1
491	104	0	0	0
491	102	0	0	1
491	13	0	1	0
491	5a	0	0	0
491	135a	1	0	0
491	135b	0	0	0
491	135c	2	0	0
491	99	0	0	1
491	95	0	1	0
491	97	0	1	1
491	96	0	0	0
491	98	0	0	0
491	8	1	0	0
491	108	1	1	0
491	108b	1	0	1
491	7b	1	1	1
491	144	1	0	0
491	140	1	0	0
491	139	1	0	1
491	155	1	1	1
491	150	0	0	1
491	156	0	1	1
491	159	1	0	0
491	160	0	1	1
491	165	0	1	1
491	164	0	1	1
491	146	1	0	0
491	158	0	1	1
491	163	0	0	0
491	161	1	1	0
491	162	0	0	0
491	157	0	0	0
491	161a	0	0	0
526	7	0	1	1

SITE ID	GRAVE #	NASO-PHARYNGEAL LESIONS	LEPROSY-HAND	LEPROSY-FOOT
526	10	1	1	0
526	4	1	1	1
526	12	0	0	1
526	0	0	0	0
526	11	0	1	1
526	1	1	1	1
526	3	0	0	1
526	5	1	1	1
526	2	1	1	1
526	9	1	1	0
526	13	0	0	0
526	15	0	0	0
526	UNK	1	0	0
533	2	0	1	1
533	1	0	0	0
533	7	0	0	0
533	9	1	0	0
533	8	1	1	1
533	4a	0	1	0
533	4b	0	0	0
533	6	0	0	0
533	3	1	0	0
533	10	0	0	0