

Records of the Institut fuer Deutsche Ostarbeit
(1940-1943): Using Anthropometrics of Polish
Populations to Examine Secular Trends and
Region Specific Variation

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DEDICATION

This dissertation is dedicated to the following people:

the memory of my mother, Elżbieta Kutyla, who showed me that even the impossible is possible. She instilled in me the inspiration to set high goals and the confidence to achieve them.

my father, Stanisław Kutyla, who has been my role-model for hard work, persistence and personal sacrifices.

my husband, Jay Lanfear, who has been proud and supportive of my work and who has shared the many challenges and sacrifices required in order for me to complete this dissertation.

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ABSTRACT

The objective of this dissertation was to describe population variation and secular trends in anthropometrics of Polish people before, during, and after World War II. The records of the Institute für Deutsche Ostarbeit (USHMM, 2008a), a dataset containing anthropometrics of the Polish population that were taken by Nazi Germans during WWII, was used in combination with other published data sources (Boas, 1928; Sikora, 1956; Stołyhwo et al., 1956; Miskiewicz, 1956; Miskiewicz, 1960; Total n= 17,732). Population structure was analyzed at three levels; town, municipality and county. Secular trends in cranial and body dimensions were investigated over an 85 year period (year of birth 1855-1940). Significant population structure was observed at all levels of analysis (Minimum FST estimates ranging from 0.0163 to 0.0523), and did not significantly differ between the sexes. A significant increasing trend in stature was observed through the entire study period for both males (+7.2cm) and females (+9.0cm) indicating an improvement in the standard of living despite the devastation created by the World Wars. Cranial vault dimensions did not follow the trend observed in stature. Rather, cephalic index underwent an increasing trend (associated with less favorable conditions) until the birth year of 1901 where it plateaus and then begins to decline in individuals born after 1926. Changes in cephalic index are due to changes in cranial breadth and length measurements in both sexes with a significant decrease in bizygomatic breadth present only in the male sample. The agrarian crisis (period of severe crop failure) that occurred during the late 19th century in Poland and World War I may be responsible for the pattern observed in cephalic index. Why secular trends in stature were unaffected during this period is unknown; however, it could be due to different sensitivities of these dimensions to environmental stress or due to differences in the pattern of growth and development. It is hoped that by demonstrating significant population structure in the Polish population more research into regional differences will be conducted and that the secular trends of the more recent past can be placed in the context of these historical data.

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CHAPTER I

INTRODUCTION

In 2007 I was awarded a Smithsonian Graduate Student Fellowship to conduct my thesis research at the National Museum of Natural History. During my stay at NMNH I was approached by Dr. Doug Owsley. As a Polish citizen he thought that I could gain access to an anthropometric dataset that he and numerous other physical anthropologists had been denied access to. This dataset was the Records of the Institut für Deutsche Ostarbeit (IDO). The anthropometric measurements were obtained during World War II by Nazi German anthropologists who were tasked with investigating the racial composition of Poland. While these data were obtained during one of the most tragic periods of time in Polish history, they also represent information about the people of Poland for which almost all other records have been lost.

When initially presented with information about these data, for personal reasons I was very interested but was unsure of what I would do with such a vast historical resource. It was not until my first semester at the University of Tennessee, Knoxville (UTK) while taking Advanced Human Variation with Dr. Richard Jantz did I realize how these data could be analyzed and what questions one could hope to address. In my time as a student at UTK my interest in human variation was piqued. My fascination with questions of secular change, migration patterns, population structure and statistics are attributable to each member of my dissertation committee (Dr. Richard Jantz, Dr. Lee Meadows Jantz, Dr. Ben Auerbach, and Dr. William Seaver). Without realizing it I had found my dissertation topic; to examine secular change, regional variation and population structure in anthropometric measurements of Polish individuals born between 1850 and the 1920s.

We all recognize the significant variation possible in the human form. It is what makes each one of us unique, and yet in the same sense it is also what brings us together. Throughout history we have been fascinated by the variation of the human form. Anthropometrics, the measurement of the body, is one of the oldest forms of quantifying this variation. Focusing on differences in the early part of history both in anthropology and the world in general lead to the creation of racial types. But anthropometrics also allowed us to move past this and recognize plasticity in the human form (Boas, 1910).

With the introduction of an evolutionary theoretical framework in anthropology historical datasets, ones originally collected for analyses of racial types are now reevaluated from this perspective. Although classical marker and DNA analyses are better suited to many questions in anthropological genetics, analysis of quantitative traits allow us to address similar questions. Anthropometric measurements are considered quantitative traits, meaning that they are controlled by multiple genes and as such can be influenced by environmental variables. The investigation as to how much of this variation is genetic and how much of it is influenced by the environment has been

central to many anthropological analyses. Significant time depth can be achieved with the use of anthropometric analyses as measurements of the human form have been collected for centuries, while classical genetic and DNA markers have only recently been developed.

Studying the effects of population history on the genetic diversity of a population can be achieved using quantitative traits. If genetic diversity varies by regions (or subpopulations) in a population, it is said to be structured. Genetic diversity can be influenced by migration (gene flow), mate choices, population size (genetic drift), mutations, and selective pressure of the environment. In the absence of all these forces genetic diversity would be homogeneous throughout all regions of a population, and population structure would be absent. In reality the absence of all forces that influence genetic diversity is very rare as at the very least we seldom choose our mates at random.

Along this vein, the Polish population is interesting to analyze in this context as it has suffered from a large number of severe changes, not only in the recent past but also in the historical and ancient past. Poland's borders have shifted significantly over time even to the extreme of nonexistence (1795-1918). With all this change it is remarkable that from a genetic standpoint the current consensus is that Poland is very homogeneous, recently confirmed by several Y chromosome studies (Ploski et al., 2002; Pepinski et al., 2004; Kayser et al., 2005; Woźniak et al., 2007; Soltyszewski et al., 2008). The assumption of genetic homogeneity in Poland also means that there have not been any significant analyses of population structure using quantitative traits. As such, this dissertation will serve as the first multivariate analysis of regional variation and population structure of the Polish population.

Understanding the genetic component of variation only gives us part of the picture in understanding human variation. Remember that quantitative traits are also influenced by the environment. The environment in this case is broadly defined as anything that influences growth and development. Nutrition, infection, psychosocial stress, and contaminants are all proximate environmental influences. The extent to which each of these proximate factors influences growth and development depends at what age and stage of development that it occurs. Add to this the fact that proximate causes are impacted by the culture, society, behavior and socioeconomic status of the individual, and the concept of 'environment' becomes very vast. While specific causality may not be attributable, the general trend is that in favorable conditions produce larger, taller individuals, whereas negative conditions stunt growth, resulting in smaller individuals.

Both cranial dimensions and dimensions of body size and limb proportions can be analyzed for secular change. A problem can arise when one analyzes data from different segments of the body as each undergoes a different level of genetic constraint as well as pattern of growth and development. Therefore an illness at age 1 will not affect each body segment equally, and can lead to different patterns of secular change. Elements that develop early, such as the cranium, are thought to be more genetically

constrained as they have less time in which the environment can impact growth and development. While elements that develop later such as distal limb segments are thought to be more environmentally plastic (most impacted by environmental stress). Despite this, the cranium has been consistently shown to exhibit secular trends but there are conflicting results as to whether these trends correspond with those of other body segments. The data analyzed in this dissertation allows for the evaluation of secular trends in the cranium in addition to body measurements and has the potential to evaluate whether similar patterns exist between the two.

There has been a significant amount of research in secular trends of the Polish population. However, the time period that has been investigated is from 1955 to present (Bielicki and Waliszko, 1991; Bielicki et al, 1992 Łaska-Mierzejewska, 1995; Bielecki et al., 2012). In Poland as in many European countries, there is a significant deficit of data for individuals during the period leading up to and during the two World Wars. This is a compelling argument for why the data of the IDO need to be analyzed using a modern anthropological approach. Without this analysis we cannot appreciate the impact of this time period on the people of Poland or provide context for later secular trends.

We, humans in general have a deep interest in how we came to be. Although I and other anthropologists in this field of research are biased in that we feel that our work is important, it really comes down to the fact that without this research we would not thoroughly understand the processes that have shaped us as a species. The assessment of population structure allows us to test theories of migration patterns. The changes observed over time from the transition from hunter-gathering societies to agriculture in our distant past, to more recent effects of urbanization on the human form allow us to evaluate the impact of our technological advancements. Without studies such as this we would not fully appreciate the evolutionary forces and history of continuous change that has shaped us into the people we are today.

CHAPTER II BACKGROUND

Polish myth traces the ancestry of the Slavic nations to three brothers, Lech, Czech and Ruś who went their separate ways in the forests of Eastern Europe, each founding a family of distinct but related people, the Polish, Czech and Ruthenian (Curtis, 1994; Davies, 2005a; Chorzempa, 2006). What this myth accurately captures is the westward migration of early West Slavic tribes following the collapse of the Roman Empire (Curtis, 1994). Between 800 and 960 A.D., approximately twenty Slavic tribes had formed small states, with the *Polanie* or Polanians (people of the plains) settling in the flatlands which were to become the heart of Poland (Curtis, 1994; Davies 2005a). In 965 to 966 Ibrahim-Ibn-Jakub, a Moorish Jew from Tortosa in Spain, accompanied the Khalif of Cordoba on an mission to central Europe. His report represents the earliest documented record of Poland. Mieszko, King of the North (as described by Ibrahim-Ibn-Jakub), was the chief of the *Polanie* who in 966 accepted Christianity on behalf of himself and his people (Curtis, 1994; Davies, 2005a). In doing so Mieszko “brought his people into the world of western culture and Latin literacy” starting the “recorded history of the Poles which has continued without a break from that day to this” (Davies, 2005a:4).

Records of the Institut für Deutsche Ostarbeit (1940-1943)

Background Information

The Second World War started on September 1st 1939, when the German battleship *Schleswig-Holstein*, moored in the port of Gdańsk (Danzig, Figure 1) on a friendship visit, opened fire on the Polish fort at Westerplatte (Davies, 2005b). Air raids were launched on Warszawa (Warsaw), Łódź, Częstochowa, Kraków (Cracow) and Poznań. Nazi action groups moved through rear areas, terrorizing the civilian population and shooting hostages and prisoners without provocation or reason (Davies, 2005b). On September 17th, the Soviet army crossed Poland’s eastern border (Davies, 2005b; Lukas, 2010). Poland was now faced with two enemies whom they never expected to fight alone.

Hampered by severed communications, inferior weapons and organization, Poland was able to defend Warszawa until September 27th 1939 (Davies, 2005b; Lukas, 2010). The division of the spoils, Poland, was outlined on September 28th 1939 in a German-Soviet convention, resulting in a demarcation line fixed along the rivers Bug and San (Davies, 2005b, Figure 2). On the German side of this division, former Polish lands were further divided into two distinct parts (Figure 2); the northern and western areas were directly annexed to the Reich while the extensive central and southern areas (Warszawa, Kraków, Radom, and Lublin districts) were formed into a separate

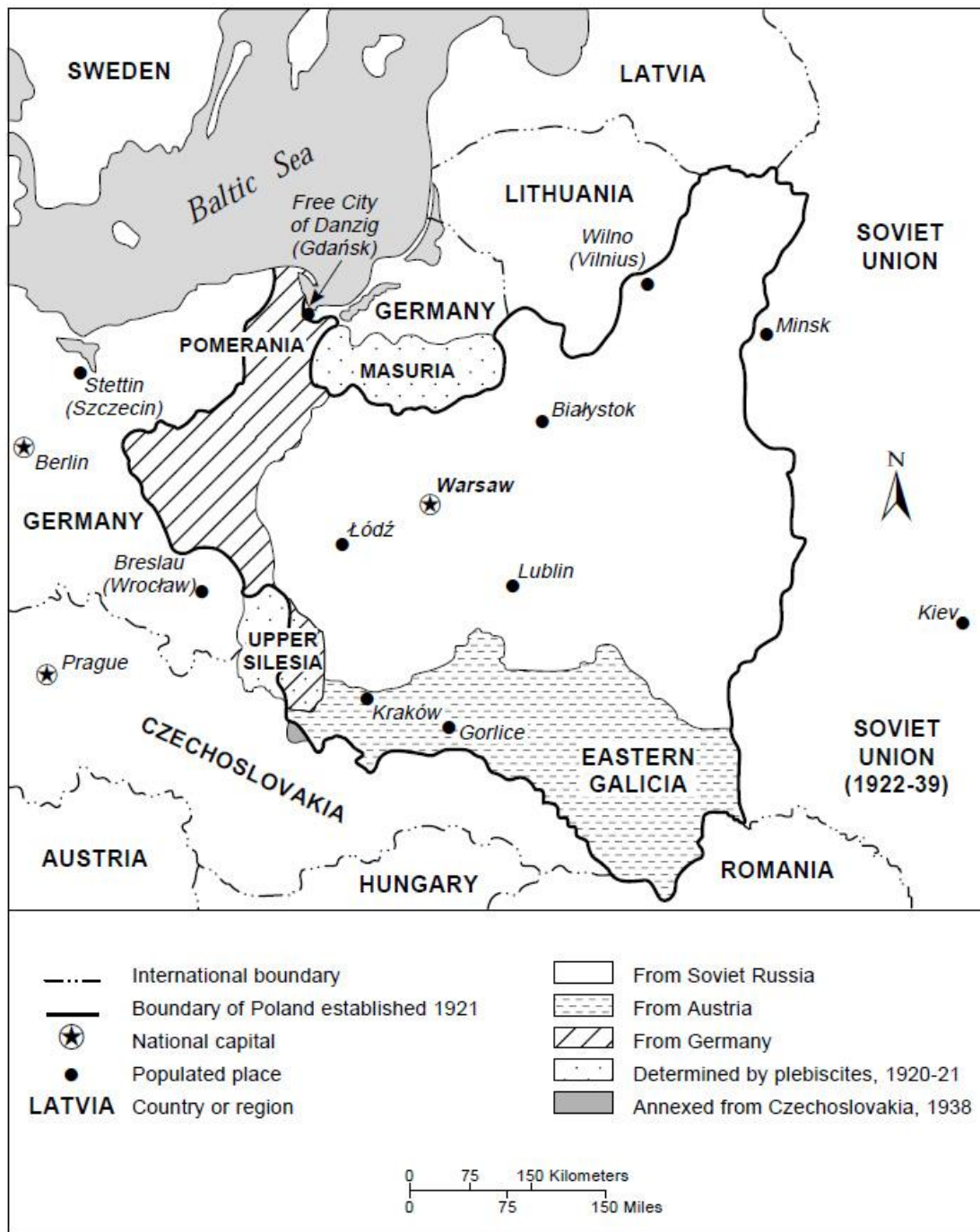


Figure 1. Independent Poland 1920-1939 (Curtis, 1994).

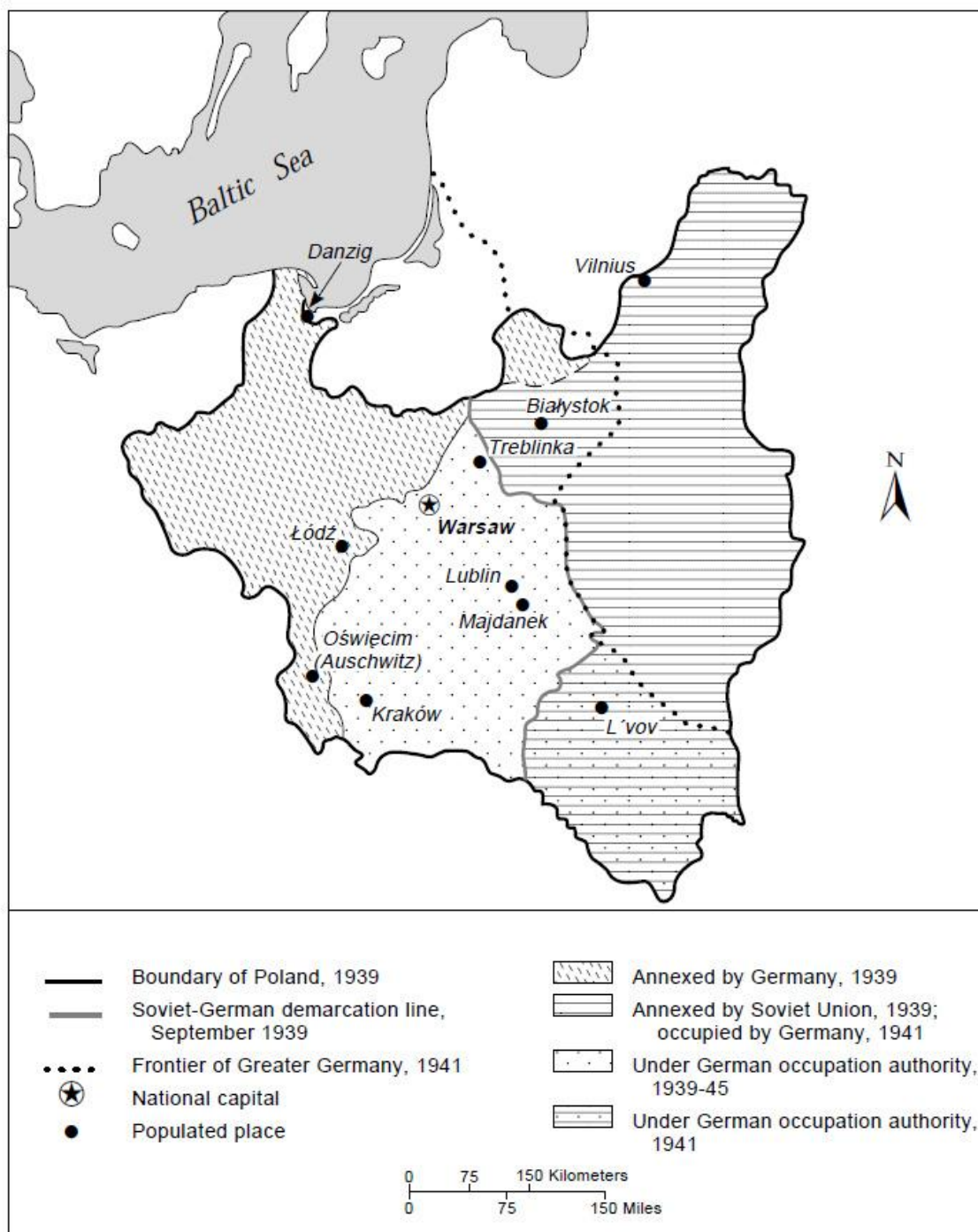


Figure 2. Occupied Poland During World War II (Curtis, 1994).

Generalgouvernement (GG) (Schafft, 2004; Davies, 2005b; Lukas, 2010). Unfortunately for Poland “both sides looked on Poles and Jews with undisguised contempt. The ‘racial enemy’ of the one was virtually indistinguishable from the ‘class enemy’ of the other” (Davies, 2005b:129).

“District by district, town by town, village by village, all citizens were obligated to register with the Nazi authorities” (Davies, 2005b:330). Each was allocated to one of four categories: “*Reichsdeutsch*, for Germans born within the old frontiers of the Reich; *Volks-deutsch*, (German Nationals) who could claim German ancestry in their family within three generations; *Nichtdeutsch*, (non-Germans) who could prove themselves free of all Jewish connections; and *Juden* (Jews)” (Davies, 2005b:330). Classification meant the difference between life or death in most situations, as ration cards were distributed based on classification. Someone classified as *Reichsdeutsch* was issued ration for 4,000 calories per day, while a Polish worker received a ration for 900 (Davies, 2005b). Once classification was completed, segregation began. Huge numbers of non-Germans were forcibly moved in order to make room for the immigrating Germans; Jews were moved into newly enclosed ghettos (Davies, 2005b).

What is typically presented by historians such as Norman Davies (2005a;b) is that a deep-seated Nazi anti-Polonism or anti-Slavism that accounted for the brutality the Nazis unleashed in 1939. Connelly (2005:773) states that “there is no hint in Nazi writings from before 1939 of some deeper ideological antipathy toward Poles that might explain the severity of German occupation”. Hitler considered Poles “racially foreign elements”; however, “the Polish victory over the Soviet Union in 1920 had made it difficult for him to conceive of Polish racial inferiority” (Connelly, 2005:773). Connelly (2005) argues that it had to do primarily with Poland’s refusal to cooperate with the Germans, as demonstrated in Poland rejecting entreaties proposed to them in 1938 and early 1939. In Connelly’s (2005) opinion Poland was the first country to say no to Hitler. As a result, Warszawa was leveled for its defiance, while German troops marched into other capitals such as Prague or Paris without a shot fired.

Whatever the reason behind the brutality that the Nazis unleashed in Poland, the end result was the same; Poland was treated differently. Unlike the German occupation of other countries such as the Czechs, Poles were forbidden their own scholarly journals as well as schools above grade six (Connelly, 2005; Davies, 2005b; Lukas, 2010). The Governor General Hans Frank is quoted as saying “The Führer told me: ‘what we have now recognized in Poland to be the elite must be liquidated; we must watch out for the seeds that begin to sprout again, so as to stamp them out again in good time’” (Lukas, 2010:8). The German definition of elite was so broad that it included not only people such as teachers, officers and landowners; but also anyone who had attended secondary school (Lukas, 2010). What this led to was the extirpation of the Polish intelligentsia as part of a systemic program to destroy Polish culture (Lukas, 2010). “The Poles, Frank said, do not need universities or secondary schools; the Polish lands are to be changed into an intellectual desert” (Lukas, 2010:10). As a result all scientific, artistic, and literary institutions in both parts of Poland were closed. Universities were occupied by German

military and civil authorities; their libraries, archives and laboratories pillaged (Lukas, 2010). The Jagiellonian University in Kraków, presents as one case where a University was shut down and occupied by German military and civil authorities. In November, 1939, under the guise of meeting, almost 200 professors and fellows of the Jagiellonian University were arrested and sent to Sachsenhausen, a concentration camp near Berlin in order to make room for the offices of the *Institut für Deutsche Ostarbeit* (IDO) (Schafft, 2004; Schuster, 2007; Lukas, 2010). Many of them died.

Formation of the IDO

The *Institut für Deutsche Ostarbeit* (IDO), the Institute for German Work in the East, was founded by decree of the Governor General Dr. Hans Frank in April 19, 1940 (Weinreich, 1946; Schafft, 2004). The Institute was set up in the Collegium Maius of the Jagiellonian University, where most of the previous professors had been arrested in the *Sonderaktion Krakau* (Special Action Kraków), codename for the Nazi operation against professors and academics of the Universities in Kraków (Arend, 2009). The IDO was tasked to “scientifically clear all fundamental questions of the Eastern Space as far as they concern the Government General and to disseminate the results of the researches” (Weinreich, 1946:95). The official opening of the IDO was set for April 20th, Hitler’s birthday, “so as to present the Führer with a gift of a particular nature” (Weinreich, 1946:95).

The director of the IDO was Dr. Wilhelm Coblitz, a jurist by education who had received his doctorate from the University of Erlangen in 1932 (Weinreich, 1946). Dr. Coblitz spoke of building German scholarship in the East upon the best German tradition at a conference held at the IDO from March 27 to 29, 1941 (Weinreich, 1946). As the “main tasks of the institute were to supply the factual material for the political aims and for the formulation of goals for German statesmanship in the East,” Coblitz proposed to open branches of the institute in Warsaw, Radom and Lublin (Weinreich, 1946:96). At this point in time Coblitz responding to the question of Eastern Jewry replied that “it was to be studied and elucidated in a very close contact with the Frankfurt Institute” and that this problem “requires a basic scientific treatment in order to prepare the all-European solution of the question by the Führer *after* the war” (Weinreich, 1946:96 emphasis mine). In a published report a year later Coblitz is quoted as stating that the solution to the Jewish problem is no longer postponed until after the war; the decision on the solution to the Jewish problem was prepared between these reports (Weinreich, 1946). Weinreich (1946:97) states that “no wonder that the Kraków institute in things Jewish leaned heavily on the Frankfurt giant-brother. There could be no thought of competing”. This goes to show that the IDO although supporting the endeavors of the Frankfurt Institute in their search for the solution to their perceived Jewish problem and published its propaganda; the research completed at the IDO, it appears, was centered primarily on other matters. This is also evidenced in the anthropometric dataset

compiled by the German anthropologists of the IDO; of 8 datasets only 1 target Jewish individuals (USHMM, 2008a).

The IDO had eleven sections including: prehistory, history, art history, law, economy, linguistics, agriculture, geology, landscaping and gardening, forestry and woodworking, and racial and national traditions research, *Rasse – und Volkstumforschung (RV)* (Schafft, 2004; Schuster, 2007). The task of each of these departments was to establish a German intellectual leadership in each of these fields so that they could explain basic questions about the Eastern sector as far as they concerned the General Government (GG) (Arend, 2009). Above all the sections for history, art history and RV were of high importance. History and art history were of significance as the Nazis regime was anxious to acquire documents which either strengthened German claims to Poland or emphasized German cultural influences in Polish society (Davies, 2005b). The art history department focused on “collecting and listing of art and architectural objects that were regarded as German” (Arend, 2009:211). An “Atlas of German Art in the Eastern Zone” was planned as the vehicle for dissemination of this department’s results (Arend, 2009). This atlas would demonstrate “the locations of monuments of German art over time, their relationship to German and European art, and to German political economic and cultural history” (Arend, 2009:211). As the stance was “there is no such thing as Polish art” by the end of 1942 Governor General Dr. Hans Frank “bragged that 90 percent of the art works in the General Government had been seized” (Lukas, 2010:11). Some museums were strategically left intact, such as the Tatra Museum of Zakopane, as the authorities planned to use these collections to demonstrate the alleged separate nationality of the Polish highland people (*Górale*) and their supposed closer relationship with the Goths (Lukas, 2010).

Although cultural artifacts in museums were used by the Nazi regime to emphasize German superiority or German claim to land of other countries, it was the research conducted in the *Sektion für Rasse – und Volkstumforschung (SRV)* that was thought would provide the much needed unequivocal evidence; namely the speculated factual material for racial categorization. Schuster (2007:3) states that the section’s directive was to “determine the racial hierarchy of the inhabitants of occupied Poland to facilitate subjugation of the region by dividing the inhabitants against one another, and thus the region’s future administration”. Dr. Anton Plugel, an anthropologist for the SRV, in a 1941 article states that “if a new order is to bring about peace, scientific explanations of [these issues] are ... essential to ensure the value and continuation of this order” (Schuster, 2007:3). The section was run over the four year period of its existence by roughly 5 German anthropologists and staff which included 2 German scientific assistants and 6 Polish assistants (Schuster, 2007).

The SRV’s investigations focused primarily on the Slavic peoples of occupied Poland. Anthropometric data, measurements, were collected in 8 field trips to different localities, one of which included individuals from a wider area of Poland that were volunteered or were conscripted to work in the *Baudienst*, building service (Wróblewski, 1984; Schuster, 2007; USHMM, 2008a). A more detailed description of the materials

contained in the anthropometric data sets will be presented in Chapter 2. Other data collected by SRV but will not be included in the current research includes hair samples, craniometric drawings, dermatoglyphics, folk culture, genealogies, sociological and medical information (Schuster, 2007; USHMM, 2008a). Additionally, the anthropometric dataset containing measurements from individuals in the Tarnów ghetto will be excluded from analysis.

The end of World War II and the IDO

The *Sektion für Rasse – und Volkstumforschung (SRV)* was able to continue its investigations until the summer of 1944 (Schafft, 2004; Schuster, 2007). At this time the Soviet Red Army was advancing and the IDO was evacuated taking most of its materials to Bavaria (Schafft, 2004; Schuster, 2007). Although the Germans made every effort to protect the documents of the IDO, as the information compiled by SVR and the technical sciences played were determined to have a “decisive meaning for the war” (Schafft, 2004;180), the United States and British Armies sieved these documents among others that were “deemed important for prosecuting war criminals or containing propaganda regarding Nazi racial theories” (Schuster, 2007:4). Ultimately the Pentagon took possession of the IDO-SRV documents (Schuster, 2007).

Early in 1947, the U.S. Army determined that the materials contained in the IDO-SRV were of no value for medical intelligence purposes and the materials were moved to the Department of Anthropology at the Smithsonian (Schafft, 2004; Schuster, 2007). The records were formally accessioned on May 27, 1947 by T. Dale Stewart, the head curator of the Anthropology Department at the time (Schuster, 2007). Although analysis of the anthropometric data and publication by the Division were planned (Schafft, 2004:86), these plans never came to fruition. The IDO-SRV collection were included in the National Anthropological Archives Collection Guide beginning in 1989, “but the collection was not fully processed for research use until 1998, when Gretchen Schafft and Gerhard Zeidler arranged and described it” (Schuster, 2007). Parts of the IDO-SRV were de-accessioned from the Smithsonian and transferred to other institutions (Schuster, 2007). This culminated in the fall of 2003 when the Polish government formally requested that the IDO-SRV materials be transferred to the Jagiellonian University Archives (Schuster, 2007). The Smithsonian, after consultation with anthropologists and legal advisors, granted the transfer on the proviso that a digital copy of the entire collection remained in the Smithsonian National Anthropological Archives, NAA (Schuster, 2007). Funding was provided by the Jagiellonian University Archives and the United States National Holocaust Memorial Museum (USHMM), where the digitization process began the fall of 2006, with repatriation of the original collection completed in the fall of 2007 (Schuster, 2007). At present in the United States a digital copy of these data can be accessed at USHMM and the NAA.

Issues Concerning the Records of the IDO

Research using the records of the Institut für Deutsche Ostarbeit (IDO) present with it unique issues and concerns. The first of which was brought to the attention of academia with the publication of Anett Rybicka's doctoral dissertation (Rybicka, 2002). Using information found in the IDO documents as the basis of her dissertation, Rybicka (2002) outlined what she thought to be a major case of treason by Polish intellectuals hired by the IDO, even going so far as to name names. The sheer fact of German occupation means that collaboration to a minimal extent had to occur. However, "problems of a moral nature began when one exceeded that minimum, doing more to further the German war goals than the Germans themselves required" (Connelly, 2005:772). Unfortunately, Rybicka (2002) never consulted the employees of the IDO who were still alive; possibly she believed that she had stumbled upon a suppressed story of collaboration. In addition to this Rybicka's (2002) did not consult the records of the Home Army (see Bałuk-Ulewiczowa, 2004).

In an attempt to set the record straight several publications (Buszko, 2003; Bałuk-Ulewiczowa, 2004) were published in addition to a panel discussion in Kraków that Rybicka refused to attend (Connelly, 2005). As it turns out the leading "collaborator" that Rybicka (2002) names, Professor Mieczysław Malecki, was in fact the chief organizer of the underground university during the war (Connelly, 2005). Underground secondary schools and universities were set up as part of an extensive and sophisticated underground culture by the Poles in response to closures mandated by Nazi officials (Davies, 2005b, Connelly, 2005, Lukas, 2010). In a sense Malecki's position in the IDO provided an excellent cover, and contrary to Rybicka's (2002) claims, actually facilitated the underground movement by utilizing and protecting rooms and equipment of the Jagiellonian University (Connelly, 2005).

In addition, parts of the library held at the Jagiellonian University were saved by many people just like Malecki. One such man, Kazimierz Stołyhwo, was able to convince Heinrich Gottong, of the newly formed Institut für Deutsche Ostarbeit, to give him permission to retrieve his personal library and manuscripts from the now occupied Department of Anthropology at the Jagiellonian University (Stołyhwo et al., 1956). Before the IDO could change its mind and overrule the decision of Gottong, Stołyhwo took his library to his house in Przegorzała, a district of Kraków (Stołyhwo et al., 1956). It was possible to move the library of Stołyhwo so quickly due to the help of Paweł Sikora and a boy from the neighboring village of Kryspinów who offered transport of the materials (in carts full of hay) at a reasonable price (Stołyhwo et al., 1956). In this library of materials were manuscripts, books and research materials, among which were the data for the anthropometric survey of the Śląsk region of Poland (*Zdjęcie Antropologiczne Śląska*); a dataset that will be used in the current research. To date Rybicka's (2002) accusations have been largely rejected by the Polish historical community (Bałuk-Ulewiczowa, 2004; Connelly, 2005).

As mentioned previously, although accessioned by the Smithsonian's Department of Anthropology in 1947 no further analysis or publications resulted from

these data (Schuster, 2007). In 1997, Gretchen Schafft' visceral reaction (forming the basis of her book [Schafft, 2004]) to her discovery at the Smithsonian of the IDO-SRV has cast an unnecessary shadow over these data. Schafft's (2004:84) response to finding hair samples associated with the records of the IDO-SRV "Hair shaven from heads, hair stuffed into mattresses, hair used to make rugs carries a million stories gathered into vivid, visual Holocaust images. Looking as these hair samples brought forth these nightmares, as well as a hint that each piece has come from an individual with an infinitely sad history. We were chastened".

In the preface to Schafft's (2004:ix) book, she states that she "wanted to expose, analyze, and critique the actions of anthropologists in the Third Reich in order to break the silence on their extensive participation in racist decision making and destruction of human lives". Streck (2006:268) in his review of Schafft's (2004) book stated that although "the author may pursue a noble cause in her cautionary appeal to be watchful when it comes to the abuse of scientific research, and this may excuse factual inaccuracies such as branding of all forms of work in wartime Germany as 'slave labor' (p.137). But her theses and conclusions about the 'culpability of German anthropologists' are confused and in their present form unacceptable"... "The book, clearly written with a great deal of engagement but little knowledge of German is, as a result of the thoroughly over simplified hypothesis, more confusing than constructive" (Streck, 2006:257).

I have to agree with Streck's (2006) opinion that a portion of Schafft's (2004) work is confusing. Schafft (2004:1) starts her book with a 'professional dilemma'; "Did I think it would be wrong to reopen the research data and explore them for the light they might shed on past populations in Poland and parts of Eastern Europe?" Schafft's (2004:2) response, a resounding yes; she "was disturbed by the conversation". Reasons Schafft (2004:2) gives to bolster her argument that to use these data would be unethical: 1. These data "were not gathered in a benign fashion. They were taken from people brought to data collection centers by force and at gunpoint"; 2. "Interpretations of the measurements could mean life or death for the subject"; 3. "I could not understand what other measurements exist with which these could be compared". The confusion sets in when one reads on to find that Schafft's (2004) own research contradicts these statements. Schafft (2004:103) concludes that "the staff did some racial certifying, but it does not appear from the materials available that it was a major focus of their work." In her archival research there is also no direct instance where anthropometric data contained in the materials of the IDO was used to determine the fate of an individual (Schafft, 2004); whether the individuals measured where to go to concentration camps, be relocated or be exterminated. The records of the IDO-SRV series 2, subseries 3 are from individuals in forced labor battalions (Schuster, 2007, USHMM, 2008a). As best as it is possible to know their anthropometric measurements were taken after their selection into these labor battalions and the anthropologists from the IDO-SRV were using this as an easy sampling of a diverse portion of the Polish population.

The fact that these data were not used to directly affect the fate of the individuals measured does not excuse the fact that these data were obtained from individuals under duress. This duress however does not appear to have been in the fashion that Schafft (2004:3) presents in the introduction to her book. These people were not measured at gunpoint nor marched into data collection centers. Interviews with children who were measured by German anthropologists of the IDO (USHMM, 2008b) indicate that they were measured at their homes, and yes, they were fearful of Germans; the process was foreign and uncomfortable for them, but at no point was it as 'horrific' as Schafft (2004) makes it out to be. Fear was to be expected as Poland was German occupied at the time and acts of terror were a common occurrence. In fairness, these interviews were conducted by Bogusław Stanisławski, archivist of the Jagellonian University in the Tarnów region of Poland in 2008 (USHMM, 2008b) four years after Schafft published her book, and so not available to her.

Schafft (2004:2) would like nothing more than these data to be "best left alone as relics of an age of terror." She states that "even if one put aside the deadly nature of the Nazi enterprise, the anthropologists' arrogant assumption in the 1940s of their *right* as a part of the German occupation of Poland to ask such questions without reflection was wrong then and wrong now" (Schafft, 2004:2). As a Polish citizen and anthropologist I beg to differ. Using these measurements and a *modern* anthropological approach does not condone nor encourage the opinions, propaganda, nor ideas of racial purification. A lack of understanding of how these data can be used does not constitute an argument against their use. These data can give a voice to the people of Poland during this time, it allows us to understand who these people were, how they were different to the people of Poland before them, after them. It allows us insight into an era that otherwise would not be possible.

Schafft (2004) takes note of the fact that the Holocaust is perceived differently in different parts of the world. She states that "the non-Jewish victims of the Third Reich are seldom, or only parenthetically, mentioned in the United States" (Schafft, 2004:9) a perspective that she perpetuates in her research. With the exception of one dataset, the data obtained by the IDO-SRV were not targeting Jewish people. Yet a disproportionate amount of her book, her research, the arguments that she presents are focused solely around the Jewish experience during occupied Poland (Schafft, 2004).

This dissertation does not set out to take sides in which peoples were more or less victimized; which suffered more or less at the hands of the German administration. Norman Davies correctly states "brute statistics speak for themselves. In six years of the war, the population of the former Polish Republic was reduced by 6,028,000. Of these, some 2.9 million were Polish Jews. Some 644,000 Polish citizens (10.7%) lost their lives as a direct result of war operations. A total of 5,384,000 citizens (89.3%) were killed in executions, in pacifications, and above all in the camps" (Davies, 2005). The largest category of victims was *both* Polish and Jewish. Nothing can change these statistics. We cannot undo what has been done; however, we can use information about the people of this time, some that in all reality never have seen freedom. They may never have

survived to 'liberation' at the end of World War II (May 6, 1945). Or they may never have lived to see the start of the third Republic of Poland in 1989. This period of time is one of the saddest in the history of humanity; however, we can learn from this information, and it would be remiss of us not to.

Poland 1850-1942

The records of the Institut für Deutsche Ostarbeit (IDO) in combination with other published anthropometric data sources in the current research is comprised of adult individuals who were born between 1850 and the 1920s. This time period is particularly interesting in that it is a period of significant economic growth in Europe. During the 18th century Poland experienced no significant economic growth as gross domestic product (GDP) per capita, measured as the gross domestic income of the country divided by population number, held steady at around 40 (Pamuk and van Zanden, 2010). By 1870 GDP per capita in Poland increased to 55; however, the most significant increase in economic growth was from 1870 to 1913 where GDP per capita almost doubled from 55 to 102 (Pamuk and van Zanden, 2010). Although significantly lower than other European countries at the time such as England (GDP per capita 288), the fact that such dramatic increase in economic growth is experienced during this period is significant. It marks the start of urbanization where Europe transitioned from an agriculture and countryside civilization to one based on cities, industry and services (Malanima, 2010). As a result of this considerable increase in economic growth living conditions in Europe significantly changed (Leonard and Ljungberg, 2010). Advances in technology, modes of transport, medical knowledge and more sanitary living conditions resulted in an overall increase in life expectancy (Leonard and Ljungberg, 2010). A European born in the 1870s could expect an average lifetime of only 35 years but by the time that the Second World War broke out the average European life expectancy had increased to 50 years (Leonard and Ljungberg, 2010).

Between 1914 and 1945 two World Wars interrupted and set back Europe's economic development and integration (Eloranta and Harrison, 2010). The result was a fragmented continent; one that had spent vast amounts of physical and human capital with the countries at its center burdened by reparations and debts, unable to achieve political and economic stability (Eloranta and Harrison, 2010). Hyperinflation was rampant in Germany, Austria, Hungary and Poland where by 1919 prices had increased tenfold or more compared to those of 1914 (Ritschl and Straumann, 2010). In essence the middle class' savings in nominal assets lost their value and war debt was eliminated (Ritschl and Straumann, 2010). Despite economic depression, famine, population displacement, ethnic cleansing and World Wars, a clear positive demographic trend is present (Milward and Baten, 2010). The population of Europe rose from 500 million in 1913 to nearly 600 million by 1950.

Data on the Human Development Index (a measure that takes into account GDP, life expectancy and distribution of knowledge in the population) during this time period

(1914-1945) indicate that Eastern and Southern Europe experienced major advances, catching up to the levels in North-West Europe. Millward and Baten (2010) argue that income growth was not the most important underlying factor. Instead they argue that it was more important how income was spent and how governments intervened (Millward and Baten, 2010). With increased spending on public health, better housing and counseling and support for mothers including childcare, infant mortality was reduced (Millward and Baten, 2010).

It appears that using only economic data does not provide entire picture of what it was like for the people of Europe during this time period and how that compares to the experiences of people born before or after them. The use of other data such as anthropometric measurements can provide information about living conditions and socioeconomic status. Changes in these measurements can be tracked over time with increases and decreases, secular trends, indicating change in the living conditions of the people of a particular time period. Unfortunately anthropometric data from Eastern Europe and in particular Poland on adults born before or around the time of the Second World War is particularly sparse (Webb et al, 2008). The current research aims to fill this void by analyzing the anthropometric data collected by the IDO in combination with other published datasets (Boas, 1928; Sikora, 1956; Stołyhwo et al., 1956; Miskiewicz, 1956; Miskiewicz, 1960; USHMM, 2008a). A more detailed discussion of how anthropometric measurements can be of significance in our understanding of the Polish population before the Second World War follows.

Anthropometrics

As the basis of this dissertation involves the analysis of anthropometric data it is important to understand first what they are, the history of anthropometrics and their use in anthropological analyses specifically when assessing regional variation and secular change, meaning change in these measurements over space and time. Anthropometry is defined as the “conventional art or system of measuring the human body and its parts” (Hrdlička, 1920:7). Within anthropometry it is important to differentiate measurements collected from skeletal material, osteometrics, with those measurements collected from the living, anthropometrics. Although both employ similar instruments and methods, including some landmarks, dimensions and indices, direct comparison between these two measures is only possible with a conversion that factors in the soft tissue included in measurements of the living, as in anthropometrics. The amount of soft tissue present over standard landmarks varies from population to population, and from individual to individual within the same population (De Greef et al., 2009). As there is a deficit of population specific data this makes the creation of standardized conversion factors difficult; as a result the current research will be limited to the use of anthropometric data.

We as a species have a deep seated fascination with understanding and describing the variations or individuality of the human form. Anthropometry is one of the oldest and longest used measures of human variation (Ulijaszek and Komlos, 2010). Hrdlička (1920:7) states that “the ideal function of anthropometry would be the complete elimination of personal bias, and the furnishing of absolutely correct data on such dimensions of the body, organs, or skeleton, as might be of importance to those who are to use the measurements.” Anthropometry as compared to visual observation or description removes the bias of the observer, so long as the measurements are obtained in a systematic unchanged fashion. Additionally, it is virtually impossible to make a systematic comparison of a large series of descriptions (Lasker, 1994). While measurement allows for comparison of large data series, in some cases they may not adequately represent biological reality (Lasker, 1994). So the goal of anthropometry is not to replace visual observation but rather to be a supplement to it (Hrdlička, 1920; Lasker, 1994).

It is because of the repeatability and unbiased, more scientific nature of anthropometry that it gained popularity in studies of human variation. The number of possible anthropometric measurements is unlimited, with the exception of “natural limits to the number or variety of measurements that can be legitimately practiced on the human body or remains” Hrdlička (1920:8). As early as the 1920s anthropometrics were being used in a multitude of different fields. Hrdlička (1920:8) names 8 fields where anthropometry is practiced: “industrial purposes; regulation of art; military selection; medical, surgical and dental purposes; detection of bodily defects and their correction in gymnastics; criminal and other identification; eugenic purposes; and for scientific investigation”. As a result of these varied interests several systems of anthropometric measurement were devised, even within the field of anthropology itself, hampering direct comparison or analysis of data obtained by differing systems of measurement. Hrdlička (1920:9) states that “it was soon found that diversity of method was very prejudicial to progress, which led to attempt at regulation of the methods and instruments by schools, by national, and finally by international agreements”.

As a measure of human variation, anthropometry's strength is its simplicity and relative cheapness of application (Ulijaszek and Komlos, 2010). As a consequence, anthropometric methods themselves have changed very little over time, with the exception of improvements to make the measurements more repeatable and the incorporation of new technologies. However, the meaning and interpretation of anthropometric variation has changed significantly as we have come to understand human variation in an evolutionary context, how variation is generated and maintained (Ulijaszek and Komlos, 2010). In the nineteenth century, anthropometry as used in physical anthropology was primarily concerned with the creation and validation of racial typologies. This anthropology of the past was “one of technique or the mastery of taking careful measurements, computing indices, and defining type specimens for static classification” (Mielke et al., 2006). After the publication of Washburn's (1951) now pivotal article titled “The New Physical Anthropology” the focus of anthropology shifted

towards a more dynamic perspective utilizing the mechanisms of evolutionary change (Mielke et al., 2006).

Assessing Regional Variation

The typological approach to assessing human variation in the early nineteenth century involved the idea of categorizing or placing individuals into one of four (or five) mutually exclusive races. This approach sorts the end products of evolution, without giving us any information about the process or mechanisms behind human variation (Washburn, 1951) and as such the use of anthropometry in the late nineteenth century was central to “the creation and reification of racial typologies, forming the basis of scientific racism and eugenics” (Uliaszek and Komlos, 2010). Studies of genetic variation of organisms were not initiated until the rediscovery of Mendel’s seminal experiments and began in earnest with the discovery of the structure of hereditary material deoxyribonucleic acid (DNA) in 1953 (O’Rourke, 2003). A powerful mathematical theory of evolutionary genetics was developed and by the late 1950s, early 1960s, anthropologists such as Roberts, Lasker, Livingstone, and Pollitzer, began using genetic data and applied theory from population genetics to investigate anthropological questions, namely to investigate patterns of human biological variation and evolution (Crawford, 2000; O’Rourke, 2003). In essence the shift away from a typological approach was “fundamentally one of point of view, which is made possible by an understanding of the way the genetic constitution of populations changes” (Washburn, 1951:298).

As a population is the basic unit for evolutionary change, anthropologists focused on analyses of population structure and population history. The definition of a population is vague as the term has been “taken over from ordinary language and employed in a number of novel contexts” (Goudge, 1955:272). Loosely defined a population can be a group of objects or organisms that share something in common. In an evolutionary sense, a population must be a group of organisms that at the very least share genes. As spatial proximity is necessary for reproductive success, sharing genes, organisms must also inhabit the same geographic region and so form a local population (Goudge, 1955). The cohesiveness of the local population is based on the premise that individuals in close proximity are more likely to interbreed; however, there are no precise boundaries to a local population (Goudge, 1955). Goudge (1955:274) states that “no point can be fixed at which the likelihood of interbreeding disappears” with the exception of special cases as in an island population. Despite this “what evolves is a local population” (Goudge, 1955:273). For example, the population of Poland can be thought of as being comprised of a series of local populations or subpopulations such as cities or counties. Alternatively you can think of the population of Europe being comprised of subpopulations, countries, where the structure of local populations within each country are ignored. Although the geographic scale varies between these two examples the same principles apply, if local or sub populations vary the population is said to be structured.

Population structure is defined as the “factors that affect mate choice and genetic relationships between individuals and subpopulations within a population” (Mielke et al., 2006:361). If populations are subdivided, even in a continuous fashion where no clear boundary exists, allele frequencies will vary revealing *population structure* as departures from Hardy-Weinberg proportions. The Hardy-Weinberg principle was independently published by Hardy (1908) and Weinberg (1908); however, it is a principle that is “so self-evident that it hardly needed to be discovered” (Crow, 1988:473). It states that in a large population where mating is random and mutation, migration, and selection are absent, genotype proportions will not change from generation to generation (Crow, 1988). However, if mating is not random such as with inbreeding or assortative mating, genotype frequencies can change, while allele frequencies do not (Crow, 1988). More important is the principle’s application; it allows for the prediction of genotype frequencies from knowledge of gene frequencies. “If alleles A and a are in the proportions p and q , the three zygotic types AA , Aa , and aa are in the proportions p^2 , $2pq$, and q^2 ” (Crow, 1988:473). Deviations from these expected proportions indicates that either nonrandom mating, mutation, migration, selection or any combination of these are present in the study population, indicating the presence of population structure though not identifying the specific cause of it. *Population history* is then defined as the “study of how history of a set of populations has affected the pattern of genetic distances between them” (Mielke et al., 2006:360).

Population structure can be assessed using qualitative and/or quantitative traits. Qualitative traits are genetic markers used to describe genotypic variation of populations, while quantitative traits are phenotypic continuous traits, such as height, used as a proxy to describe the genotypic variation of populations. Quantitative traits tend to be polygenic, meaning that multiple genes are responsible for the phenotype. As a result quantitative traits include the effects of the environment, development, sexual dimorphism and age on the phenotype observed. This problem, one of phenotypic plasticity can be somewhat eliminated by using statistical models where heritability (the proportion of phenotypic variation in a population that is attributable to genetic variation [Relethford, 2007]) of the trait is calculated. By using statistical models in quantitative genetics biological anthropologists are able to calculate selection response, biological distance (measure of dissimilarity or population divergence based on polygenic traits [Buikstra et al., 1990]) and determine phenotypic plasticity (ability of an organism with a given genotype to change its phenotype in response to changes in the environment). As most anthropometric measurements are quantitative traits, the history of their use in the analysis of population structure and subsequent description of regional variation, will be discussed.

The basis of quantitative genetics was started with Fisher (1918) who showed that biometry and Mendelianism were compatible (an argument that never took place in the United States [Crow, 1988]) in that features such as stature were determined by a large number of Mendelian factors and worked out a theory of correlations between genetic and environmental factors. Despite this biological anthropologists rarely

conducted research using quantitative traits in an explicit population genetics framework until the work of Relethford and colleagues in the 1980s (Relethford and Lees, 1982; Williams-Blangero et al., 1990). Up until this point studies of human population structure tended to use and prefer qualitative traits in their analyses due to the problems of unknown mode of inheritance and the fact that the environment to some extent influences the expression of these traits (Harrison, 1977; Relethford and Lees, 1982; Williams-Blangero et al., 1990).

Relethford and Lees (1982) state that ignorance of the mode of inheritance for quantitative traits may not be extremely detrimental to this type of analysis as deviations due to dominant or recessive modes of inheritance may be assumed to cancel one another. Livingstone (1972) used simulation to test this assumption and found that the effects of genetic drift and dominance on polygenic traits had little effect on phenotypic variation over time. This provides the foundation for the primary model used in quantitative trait analysis, the equal and additive effects model the basic principle of which is “that the phenotype reflects the net effect of polygenic inheritance, with each locus having an *equal* effect on the genotype, and where these effects are *additive*” (Relethford, 2007:191). However, even with an equal and additive effects model it may be difficult to assess the phenotypic variation observed as a number of genotypes could specify the same phenotype (Relethford and Lees, 1982). While this obscures the individual genes being observed, it is still possible to elucidate general trends in among-group variation (Relethford and Lees, 1982).

Non-genetic influences due to the environment, sexual and developmental variation as well as inter- and intra- observer error further complicate genetic inference from quantitative traits (Relethford and Lees, 1982; Chakraborty, 1990; Relethford, 2002a). These influences are generally more difficult to take into account; however, “the degree and type of non-genetic variation will depend on the specific type of variables used in analysis” (Relethford and Lees, 1982:115). Careful sampling, choice of variables and use of statistical adjustments can at least in part control for certain non-genetic variation (Relethford and Lees, 1982). One way to deal with this issue is to assume that the non-genetic effects are nonexistent or distributed randomly among populations (Relethford and Lees, 1982). Sampling is key when making this assumption which is best made with local populations of similar environments or within a fairly narrow geographic area (Relethford and Lees, 1982; Relethford, 2007).

The effects of evolutionary forces on quantitative traits have been investigated primarily through a model-free or indirect approach by examining the concordance of various types of data, such as anthropometric distances with genetic, geographic, linguistic, etc. distances (Relethford and Lees, 1982; Relethford, 2007). The results of such studies are measures of biological similarity interpreted in light of models of population structure, but no parameters of these models are estimated (Relethford and Lees, 1982). While these indirect methods prove useful in the analysis of quantitative traits it is important to employ direct or model-bound methods as these allow for the comparison with data obtained from genetic studies not just simply be indirect

correspondence, but by direct comparison of the models underlying measures and parameters (Relethford, 2007).

The R matrix is one method of measuring genetic similarity that is easily extended to quantitative traits. It has been frequently used in the anthropological literature and was originally developed allele or haplotype frequency data by Harpending and Jenkins (1973). Using allele or haplotype data genetic similarity is represented in each element (r_{ij}) of the matrix and are computed for each allele and then averaged over all alleles:

$$r_{ij} = \frac{(p_i - \bar{p})(p_j - \bar{p})}{\bar{p}(1 - \bar{p})},$$

“where p_i and p_j are the allele frequencies in populations i and j , respectively, and $\bar{p}$ is the weighted mean allele frequency over all populations, ideally a weighted mean where weighting is done by population size” (Relethford et al. 1997:448; Relethford, 2002a:35; Relethford, 2007:195). As the average of all elements in the R matrix by definition equal to zero, positive values of r_{ij} indicate that the pair of populations is more similar to one another than on average, whereas a negative value of r_{ij} indicates that the pair of populations are more dissimilar than average. The basic method for estimating the R matrix from quantitative traits uses the equal and additive effects model and is clearly derived in Relethford and Blangero (1990). The method was originally developed by Williams-Blangero and Blangero (1989) and Relethford and Blangero (1990) and later refined by Relethford et al., (1997) who have included these calculations in the statistical software program called RMET 5.0 (Relethford, 2012).

Once the R matrix has been calculated further calculations can be made that can be used in population comparisons. One of the more widely used measure is Wright’s F_{ST} which is a “measure of variation among populations relative to the amount of variation expected under panmixia (where all individuals from all populations are equally likely to mate with each other)” or in the absence of population structure (Relethford, 2007:195). Heritability (h^2) or at least an estimate of heritability for the traits used in the analysis is required to estimate from F_{ST} quantitative traits. Ideally, the estimate of heritability should come from the same population being studied, and can be done so if data exists for parents and offspring. In this case narrow sense heritability can be estimated from a parent-offspring regression (Königsberg, 2000); however, in practice the availability of data which would allow for accurate heritability estimates to be calculated are rare (Relethford, 2007). It is still possible to calculate F_{ST} without a heritability estimate but in this case it must be understood that what is being computed is the *minimum* F_{ST} . Without an estimate of heritability the calculation uses the value of 1 as a default, meaning that all of the phenotypic variation is due to genetic variation. It is said to be a *minimum* possible value as the smaller heritability the higher the value of F_{ST} will actually be (Relethford, 2007). F_{ST} and *minimum* F_{ST} are related as follows:

$$F_{ST} = \frac{MinF_{ST}}{MinF_{ST} + h^2(1 - MinF_{ST})}$$

This is an important relationship to understand when it comes to using *minimum* F_{ST} to compare the results of different studies. Comparisons using *minimum* F_{ST} should be limited to studies where it is reasonable to assume that the populations investigated have the same or similar level of heritability for quantitative traits under investigation (Relethford, 2002a; Relethford, 2007).

Wright's F_{ST} can also be used in within population analysis. For example, comparison of Wright's F_{ST} for males and females can provide information about sex-biased migration (Prugnolle and de Meeus, 2002). Mammals in general follow a philopatric dispersal pattern where one sex stays or returns to their natal site or group to breed, while the other sex is more prone to disperse (Prugnolle and de Meeus, 2002). In humans investigations into the rate of migration among populations has revealed that migration rates are almost 8 times higher for females than in males which is attributed to patrilocality, the tendency for females to move to their mates' residence after marriage (Seielstad, et al., 1998). As Wright's F_{ST} is a measure of genetic differentiation one could expect that the sex with the higher dispersal exhibit lower between subpopulation F_{ST} than that of the sex that is dispersing less (Prugnolle and de Meeus, 2002). Wilder et al. (2004) found that human population structure may not be influenced by sex-biased migration on a global-scale; however, this does not mean that it is not significant at a local scale. The data in this study allows for the analysis of sex-biased migration and it is expected that females will have lower subpopulation F_{ST} than males.

While Wright's F_{ST} informs us of the degree of differentiation between populations it does not provide us with information as to the pattern of this variation (Relethford, 2007). Calculations of genetic distances allow for the assessment of any patterns of variation through comparisons with geographic, linguistic or historical relationships. Genetic distances can be calculated from the R matrix as follows, and like calculation for F_{ST} it requires a heritability estimate.

$$d_{ij}^2 = r_{ii} + r_{jj} - 2r_{ij}$$

However, unlike F_{ST} the minimum distance estimate produced without adjustment for heritability is actually proportional to what the true genetic distances would be allowing for their use in distance maps, correlation analysis as well as in other methods of distance analysis (Relethford, 2007).

Although genetic distances appear very intuitive with larger distances indicating greater divergence between populations, they are actually not always easy to interpret. The divergence could be the result of genetic drift, increased or decreased gene flow with populations outside of the area of analysis, difference in environment, population history or some other factors. Typically correlations with geography, history and

demography can shed some insight into the reasons behind divergence or lack thereof; however, this approach relies on making inferences about population relationships from external data (Relethford, 2007). Another approach, the Relethford-Blangero method, utilizes computed heterozygosity measures from the *R* matrix to determine relative levels of gene flow from the observed data. Observed and expected values of heterozygosity are compared so that higher than average heterozygosity values can be interpreted as indicating a higher than average level of *external* gene flow with the opposite being the case for lower values (Relethford, 2007). Relethford and Blangero (1990) and Relethford et al. (1997) found that even with crude estimates of average heritability the method still works well in that it was able to detect gene flow in two different cases, using dermatoglyphic traits from Nepal and anthropometric traits from Ireland.

Within the last 20 years the use of quantitative traits in biological anthropology to assess population structure using a model-bound or direct approach have allowed for investigation of past populations that could previously only be analyzed indirectly. From historical anthropometric data obtained even a few generations ago (Relethford, 1988; Williams-Blangero and Blangero, 1989; Relethford and Blangero, 1990; Konigsberg and Ousley, 1995; Relethford et al., 1997), to osteometric data obtained from skeletal assemblages that are hundreds of years old (Key and Jantz, 1990; Konigsberg, 2002a&b; Relethford, 2001; Relethford, 2002b), these methods allow us to the opportunity to view and understand a world that no longer exists (Relethford, 2002a). Analyses of this kind have also further explored the validity of these models, particularly in the assumptions made. One assumption made in using the *R* matrix to assess population structure is that the subpopulations investigated have to have existed at the same time with some possibility of interbreeding. The limitations of model-bound approaches are much more evident in cemetery analyses where it is quite possible that many individuals buried there were not alive at the same time to constitute a population. Konigsberg (1990a&b) illustrates how the special and temporal aspects to such skeletal assemblages can be dealt with and lead to the implementation of other statistical approaches such as new models and time series analysis.

In Poland variation in quantitative traits has been investigated primarily using a model free approach. Early studies primarily involved investigations in assortative mating and resulting heterozygosity (Wolanski, 1975; Siniarska, 1981; Wolanski and Siniarska, 1984; Wolanski, 1994). The current focus it seems is in investigations of secular trends (change in these measures over time – discussed in the next section) and from the perspective of human ecology with an emphasis on investigating the effects of socio-economic conditions (Bielicki and Waliszko, 1991; Zielińska, 1991; Bielicki et al., 1992; Wolanski, 1994; Kolodziej et al., 2001; Wolanski and Siniarska, 2004; Koziel et al., 2010 Woronkowicz et al., 2012; among others). While these are worthwhile investigations they would be more informative if pursued using model-bound approaches.

The potential reason behind the lack of interest in population structure using quantitative traits in Poland could stem from the assumption that the Polish population is homogeneous. Recently, genetic population studies using Y-chromosome haplotypes in Poland have demonstrated that the Polish population is very homogeneous but very distinct from populations sampled from neighboring countries such as Germany, Lithuania, Russia, Estonia and Latvia (Ploski et al., 2002; Kayser et al., 2005; Pepinski et al., 2004; Pepinski et al., 2005; Soltyszewski et al., 2008). Additionally, Kayser et al. (2005) found that the population differentiation between Poland and Germany resulted in a genetic border approximating the current political border between the two countries. These results are interesting in light of Poland's long history of large severe changes in territory and subsequent population movements. In light of such significant migration, it seems counterintuitive that the Polish population would be more distinct from its neighboring countries than among populations of different regions in Poland. One of the hypotheses to explain these results is that the massive migrations that took place in Poland after World War II might be responsible for this homogeneity (Wozniak et al., 2007). However, in Wozniak et al.'s (2007) analysis of Y-chromosome haplotypes from populations of Southern Poland from before and after World War II indicate that the populations at least in this region of Poland could have been highly homogeneous even before the war.

When these results are observed in light of other Europe-wide investigations they do not seem as surprising. Analyses of the genetic structure of European populations using autosomal markers "found only a low level of genetic differentiation between subpopulations, the existing differences were characterized by a strong continent-wide correlation between geographic and genetic distance" (Lao et al., 2008:2). Research using Y-chromosomal diversity also found similar results with variation being primarily influenced by geography rather than linguistics (Rosser et al., 2000). However, when using Y-chromosome STRs and polymorphisms to investigate genetic variation of Slavic countries revealed no relationship between the genetic variation observed and linguistic, geographical or historical data between the Slavic populations (Rębała et al., 2007; Petrejčiková et al., 2010). The results show "homogeneity of Northern Slavic paternal lineages in Europe shown to stretch from the Alps to the upper Volga and involve ethnicities speaking completely different branches of the Slavic languages" (Rębała et al., 2007:406). To further confound matters, Kuzniar and Ploski (2004) found that populations in Central and Southern Poland significantly differ based on STR data for the Power Plex-16 loci. In any case it will be interesting to see what results are obtained using quantitative, anthropometric traits, as in this research study.

In summary, regional variation as expressed by population structure is important to biological anthropologists as its models, patterns and theories can be used to explain modern human variation. It is obvious that in addition to conventional genetic factors, an understanding of demography, ecology, environment of the natural habitat, social behaviors and all other factors which promote migration and colonization are very important for understanding modern human population structure. Whether it be

through quantitative or qualitative traits, detecting population structure is not only important in an academic sense, allowing us to better understand migration patterns and gene flow, but is equally so in unraveling the genetic basis of common human diseases. With “recent advances in in genotyping technologies and increase in genetic marker availability have paved the way for association studies on genomic scales” (Marchini et al., 2004:512). Balding (2006) and Marchini et al. (2004) state that association studies on a population based scale can be influenced by population structure, particularly if its presence has been undetected. In these cases the underlying population structure may be behind the signal of a positive association leading to false positives or it can act to mask real effects (Marchini et al., 2004).

Secular Change

Secular change, or trend, can be defined as “the process that results in a change in the mean size or shape of individuals of a population from one generation to the next. Such trends can be positive (increasing size) or negative (decreasing size)” (Bogin, 1999:407). It is typically attributed to non-genetic influences on phenotypic expression, referred to as *plasticity*, as it is thought that significant genetic change in a population takes longer to manifest in the absence of significant external forces (such as gene flow, genetic drift, etc.). Plasticity of the human form was first identified by Boas (1910) but it was not until the 1960s that it was used as an explanatory framework in studies of human adaptation (Godina, 2009; Komlos, 2009; Ulijaszek and Komlos, 2010). Anthropometry “as a measure of physiological and developmental plasticity in relation to environmental quality” was embraced by biological anthropology by the mid-twentieth century (Ulijaszek and Komlos, 2010:184). Since then it has been shown that socioeconomic status is correlated with many anthropometric measurements, most notably stature which tend to correlate positively with wealth.

Plasticity is a process that primarily occurs during growth and development, where adequate nutrition is required in order to attain maximum genetic potential. This modification during growth and development is virtually irreversible after adulthood (Lasker, 1969; Tanner, 1981). Essentially what this means is that adults are the product of the interaction between genetics and their environment in childhood. Growth in its simplest model is presented as being goal-seeking and self-correcting, goal seeking from the genetic component and self-stabilizing through its plastic response to external stimuli, such as nutrition and environmental conditions (Tanner, 1963; Bogin, 1999). Variation in growth and development can be interpreted in one of two ways, as a means of adaption or as a measure of adaptation (Schell, 1995). In the human adaptability paradigm growth is the mechanism of plasticity and can explain adaptations to thermal extremes and high-altitude hypoxia (Schell, 1995). In thermal extremes changes in growth and development result in alterations to the ratio of surface area to body mass so that heat can be lost or retained more efficiently in the given environment (Schell, 1995). A pattern of “accelerated growth of oxygen transport systems and the slowed

growth of body size” is the response thought to occur during growth and development in response to high-altitude hypoxia (Schell, 1995:224).

In the medical model growth reflects the health of the organism, with growth to one’s maximum genetic potential indicating health whereas retardation of growth indicates ill-health (Schell, 1995). This approach allows for the assessment of a population’s wellbeing by measuring growth, or the end product of growth such as adult stature. Populations can be compared if they share similar genetic potentials for growth, with the most common analysis involving measurements taken from the same population over time. In this case changes in growth would by proxy indicate changes in the environment, with better environments being represented by increased growth (only to the point of maximum genetic potential). This is particularly of interest in historical data where changes from agriculture, industrialization to the digital age can be interpreted.

The human adaptability and medical growth models appear to be in conflict. In the medical model small size for age would not be considered well adapted; whereas in the human adaptability model small size for age would be considered well adapted in colder climates (Schell, 1995). Ultimately these models look at adaptation or plasticity from different angles, with the medical model best suited for studies where change in “man-made” circumstances arise such as socioeconomic status and the human adaptability model best suited for studies in changes in the natural environment (Schell, 1995). The current research will employ the medical model as changes in the Polish population over time will be analyzed in light of changes in “man-made” circumstances such as socioeconomic status.

Since the 1960s the socioeconomic correlates of human height have been investigated in disciplines such as anthropology, auxology, military history and by the 1970s expanded into the fields of developmental economics and cliometrics (Komlos, 2009). The measurement of human height was favored as it has been systematically studied since the 18th century and so a large amount of historical data were available, at times from some unlikely sources such as in Komlos (1994) who used runaway slave advertisements to assess nutritional status of slaves from 1720 to 1770. Cliometricians were the first to expand upon this type of research, termed ‘anthropometric history’, where biological measures such as stature, morbidity and mortality are used in tandem with more conventional economic indicators of well-being such as income, labor productivity, and the ‘Gini ratio’ (Fogel, 1994; Steckel, 1995; Fogel 2004; Steckel, 2008; Komlos, 2009; Floud et al., 2011). The ‘Gini ratio’ or ‘concentration ratio’ is a measure of income inequality based on a scale from 0 (perfect equality) to 1 (maximum inequality) and is widely used by economists (Fogel, 2004). Fogel (2004) states that in England, the United States and other rich nations the inequality of income distributions, or the ‘Gini ratio’, reduced by over two-thirds between 1700 and 1973, from 0.65 to 0.32. Coupled with an increase in real income of these populations, what this change in the ‘Gini ratio’ shows is that the per capita income of the lower class was increasing much more rapidly than the middle and upper class (Fogel, 2004). While these purely economic measures

are useful what biological measures provide are indexes for standards of living of populations or subpopulations were none exist; for example, in subgroups such as women, children or self-sufficient peasants, as no direct means of income could be calculated and now forms the basis for the schema of technophysio evolution (Fogel, 2004; Komlos, 2009; Floud et al., 2011).

Floud et al. (2011:location473) outline the basis of multidisciplinary studies, not just studies in economics, using the schema of technophysio evolution as the following:

1. *The nutritional status of a generation – shown by the size and shape of their bodies – determines how long that generation will live and how much work its members will be able to do.*
2. *The work of a generation, measured both in hours, days and weeks of work and in work intensity, when combined with available technology, determines the output of that generation in terms of goods and services.*
3. *The output of a generation is partly determined by its inheritance from past generations; it also determines its standard of living and its distribution of income and wealth, together with the investment it makes in technology.*
4. *The standard of living of a generation determines, through its fertility and the distribution of income and wealth, the nutritional status of the next generation.*
5. *And so on ad infinitum.*

The schema is not meant to be taken as a deterministic model; rather each statement should be considered *ceteris paribus* – other things being equal (Floud et al., 2011). By placing observed difference in body size and shape into an economic evolution model as anthropologists we are able to make better inferences as to why observed changes, or lack of change is present. This is especially the case when we track economic changes and changes in body form over time, what is typically observed is that in situations where socioeconomic situations are improving there will be a lag before these improvements are seen in body size and shape measures (Fogel, 2004; Floud et al., 2011).

Methods of assessing patterns of human growth and developmental plasticity from anthropometrics (body measurements) in anthropology and other disciplines include measurements of juveniles and adults. While measurements of adults are typically more prevalent in historical data these data provide us with the end result of the environmental influences on the individual. They do not provide detailed information about the dynamics of growth such as changes in the rate of growth (Bogin, 1999). It is a similar case with juvenile cross-sectional data, where measurement data is

collected from individuals once in their lifetime, rather than a series of repeated measurements taken over time as in longitudinal studies. Cross-sectional data is more common as it is less costly and takes significantly less time and effort to complete than longitudinal studies where subjects are tracked over a period of years. One of the longest longitudinal growth studies is the Fels Longitudinal Study which started in 1929 in Yellow Springs, Ohio and is still in progress although now part of the Wright State University's Boonshoft School of Medicine (Rouche, 1992; Boonshoft School of Medicine, 2012). The results of the Fels Longitudinal Study through 1991 is published in Roche (1992), and continues to be significant today with the United States pediatric growth charts from 1978 to 2000 produced exclusively from these data for children from birth to 3 years of age (Boonshoft School of Medicine, 2012). Additionally, Fels data was also used to produce standard methods of measuring skeletal maturation of American children was (Boonshoft School of Medicine, 2012).

Longitudinal studies are thought to be more informative than cross-sectional studies because "they indicate the rate of growth, timing of the adolescent growth spurt, and attainment of adult size" (Zemel and Johnston, 1994:563). However, given sufficiently large sample sizes, cross-sectional data can approximate longitudinal growth patterns (Zemel and Johnston, 1994). Zemel and Johnston (1994) have demonstrated that cross-sectional data can be analyzed using growth models as for males parameter estimates were very similar to those obtained through the true longitudinal growth patterns. However, this was not the case with the females in this study and demonstrates the need to carefully assess assumptions and potential sources of bias before this method is used (Zemel and Johnston, 1994). The model selected, in this case the Preece-Baines model inferred longitudinal growth parameters well for males, but not so in females. Additionally, variability in growth rates of the females in this study had a significant impact on the sampling error rendering the models of cross-sectional data useless (Zemel and Johnson, 1994). From this study it is clear that only a limited number of cross-sectional datasets could be appropriate for this type of approach. Cross-sectional data would ideally have a representative sample in each age-sex group of interest and be sufficiently large as an age-group sample mean is used in lieu of the measurements of an individual (as in longitudinal data). Zemel and Johnson (1994) recommend sample sizes of a minimum 500 individuals, with at least 20 individuals per age-sex group. Most of the time this is not possible and analyses are limited to comparison of age-group averages with national standards and/or other studies.

Although the use of cross-sectional data at times may appear limited especially comprised only of adults, given data on the right variables, ones including body proportions, more information can be gleaned from a simple comparison of averages. Allometry is defined as the "differential rates of growth of parts of the body relative to the growth of the body as a whole" (Bogin, 1999:399) and can be assessed using measurements of body proportions. The concept of plasticity in body proportions implies that different parts of the body respond differently to whatever factors are responsible for secular changes (Himes, 1979). In general, body parts that grow the

fastest will be more affected by a shortage of nutrients, infection, etc. and using the cephalo-caudal principle of growth “the legs, especially the tibia, are growing faster relative to other body segments from birth to age 7 years” (Bogin and Varela-Silva, 2009:448). Several recent studies have demonstrated that leg length and body proportions are strong indicators of the quality of the environment, with increases in all measures of leg length associated with better environments and overall health (Frisancho et al., 2001; Bogin, 2002; Wadsworth et al., 2002; Malina et al., 2004; Li et al., 2007; Dasgupta et al., 2008; Floyd, 2008).

Changes in limb proportions have also been examined in skeletal samples. The Arikara Indians dating from AD1600 to 1830 show a temporal pattern in lower limb proportions with earlier sites characterized by longer femora and shorter tibiae, with the reverse for the later sites (Jantz and Owsley, 1984). Following Bogin and Varela-Silva (2009) these results could indicate that the environment, in a broad sense, was improving over time as reflected in the increase in relative tibia length. Overall from this information what we see is not just an increase in stature over time, but also a positive trend in relative leg length, longer legs with respect to total stature. Meadows and Jantz (1995) found in the United States that from the 1800s to 1995 there was an increasing trend in lower limb bone length that was accompanied by relatively longer tibiae. In the case of Mexico estimated leg length accounts for about 70% in the increase in height of young adult males over a period of 32 years (Malina et al., 2004). However, in females it is sitting height that is responsible for 66% of increase in height in adolescent and young adult females (Malina et al., 2004). Differences in secular trends between the sexes can be reflective of differences in growth, development and/or female “buffering” against negative environmental influences (Bogin, 1995). Overall, it is possible that changes in limb proportions could indicate different environments during childhood that individuals of the same stature were exposed to. Therefore analyzing limb proportions makes for more informative analyses than simple comparisons of stature. However, as all limb segments scale positively with stature one must be careful in interpretation of high intralimb indices as they can be the result of scaling rather than environment (Auerbach and Sylvester, 2011).

In Europe secular trends in stature have been recorded since the early 18th century and follow trends in socioeconomic prosperity and decline (Komlos and Cinnirella, 2007). However in an Eastern European study which analyzed 24,012 individuals born between 1933 and 1957 in Russia, Poland and the Czech Republic secular trends in stature did not correspond during periods of socioeconomic decline (Webb et al., 2008). Positive secular trends in height were observed throughout the entire study period with only a small reduction in height in individuals born during the Second World War that was only significant in Russian individuals from Novosibirsk (Webb et al., 2008). In a survey of 19 year old Polish conscripts in 1976 and 1986 this trend was also demonstrated, as despite a serious economic crisis in the early 1980s increases in stature continued unabated (Bielski and Waliszko, 1991). A similar trend, of significant increases in stature were also observed in analyses of Polish schoolboys aged

7-18 years from 1955 to 1988 despite dramatic periods of social and economic transitions (Bielicki et al., 2012). When compared to data from other European countries it is evident that in the 1960s Polish boys age 8 and 18 were significantly shorter but by the 1980s they had for the most part caught up to the average heights in other countries (Bielicki et al., 2012).

Additionally, it should be noted that differences between rural and urban populations were preserved, with individuals in rural areas being significantly shorter than their urban counterparts (Bielicki and Welon, 1982; Bielicki and Waliszko, 1991; Bielicki et al., 1992). A trend that appears to be reversing in conscripts examined in 1995, where conscripts whose parents were both from rural areas were on average taller than conscripts whose parents were of urban origin (Kolodziej et al., 2001). During this same period of time several studies investigating secular trends in age of menarche found that before the mid-1970s a significant trend toward earlier menarche was present, whereas between the mid-1970s and mid-1980s this trend ceased and in some groups reversed (Hulanucka et al., 1990; Łaska-Mierzejewska, 1991; Woronkiewicz, 2012). It seems apparent these two measures are not equally sensitive to changes in socioeconomic status, with menarche being more sensitive to changes whereas stature may be though to lag after such events. Bielicki et al., (2012) feel that the observations of increasing stature even in periods of economic decline are unlikely to be entirely attributable to a delay of maturation. Rather it may be a consequence of the very complex economic situation before, during and after the war, with even the war itself acting as a selective agent for the survival of stronger, healthier children (Bielicki et al., 2012).

Plasticity in craniofacial morphology was first presented in Boas' (1910) immigrant study. Despite this, the cranium is still regarded as being more genetically constrained compared to postcranial elements. This is because growth and development proceeds in a cranio-caudal manner, meaning that cranial elements are formed earlier during growth and development leaving significantly less time for the environment to influence them. Despite a more limited time for environmental influence significant secular trends have been consistently found. Early investigations found significant secular trends with changes in cranial depth and height measurements but no significant change in cranial breadth measurements (Kohn, 1991). A reevaluation of Boas' (1910) conclusions concerning change in cranial index of American and foreign born Hebrews and Sicilians support these initial findings where cranial length is more sensitive to environmental factors than that of cranial breadth (Jantz and Logan, 2010). As a result, positive environmental changes are typically associated with lower cranial indices, while negative environmental changes result in an increase in cranial index (Jantz and Logan, 2010).

Historically cranial index has been used more frequently than any other cranial dimension in the assessment of human variation over space and time. However, recent studies indicate that the craniofacial variable that shows the most significant change in populations over time is cranial (vault) height (Jantz and Jantz, 2000; Jantz, 2001).

Cranial components such as vault, neurocranial, facial, maxillary and mandibular dimensions are thought to vary independently of one another (Kohn, 1991) and there appears to be no consensus as to the degree of concordance with secular trends of body dimensions. The facial skeleton has been shown to exhibit the least amount of secular change despite its similarity in growth patterns as stature and long bones (Jantz and Jantz, 2000). With the exception of horizontal craniofacial measures Buretić-Tomljanović et al.'s (2006) results suggest a low relationship between craniofacial dimensions and body growth. Along the same lines Auerbach (2011) found that cranial height (basion-bregma) cannot be estimated from any postcranial element further supporting the idea that the cranium is independent of the postcranial skeleton. However, Jantz and Jantz (2000) found correspondence between secular trends of vault height and stature. It is possible that this correspondence or lack thereof is due to differences in growth and development as the most intensive period of growth for cranial elements is much early in life than that of postcranial elements. As a result changes in vault dimensions may be sensitive to environmental changes that occur much earlier life than those of the face and postcranial elements (Jantz and Jantz, 2000). Following this reasoning it may be that concordance between cranial and postcranial trends may indicate a consistent environment throughout growth and development; whereas discordance may demonstrate that the environment of early childhood differed from that experienced during later periods of growth. More research is needed so that we can better understand differential sensitivity to environmental condition between different portions of the body.

Unfortunately, secular trend in craniofacial morphology has not been as thoroughly investigated in the Polish population. Henneberg (1975) indicates that Poland follows the trend of other Central European populations in that there is an increase in brachycephalization, the increasing value of the cranial index (ratio maximum cranial breadth to length), since the early Middle Ages. Gleń et al. (1981) found that average cranial index was homogeneous in the 5 districts analyzed (Katowice, Knurów, Rybnik, Pszczyna and Tarnowskie Góry) and that stature best separated individuals based on profession rather than measures of craniofacial morphology. Lorkiewicz (2005) found that head length followed by head circumference differentiated children aged 7-19 of different socioeconomic status from the city of Łódź, Poland. The children from better socio-economic situation (higher parental education and occupational status, less children in the family) have larger head dimensions, they are more dolichocephalic, more narrow-faced and have relatively broader noses (Lorkiewicz, 2005). As evidenced by these studies further research is necessary to better evaluate secular trends in craniofacial morphology as the trend found in many European populations is debrachycephalization associated with increase in stature, which is the opposite of that found in Japanese and Korean populations (Kouchi, 2000). It may be the case that secular trends in craniofacial morphology are population specific (Jantz and Jantz, 2000).

In summary, anthropometric data provide a means to understand past populations and provide a comparative means to assess differences within populations over time as well as between populations. Developmental plasticity or environmental adaptation provides insight into the response of the human body to the significant socioeconomic changes that the population of the world has and is still going through. Despite the fact that these measures are influenced by the environment it is still possible to elucidate population structure and biological history allowing for the assessment of genetic relationships through the analysis of these quantitative traits (Relethford, 2004; Jantz, 2006).

Hypotheses

Based on what we know about Poland, population structure and secular change we would assume the following:

- ❖ Regional Variation and Population Structure is present in Poland
 - The genetic distance between pairs of populations will be small if they are geographically located near each other; whereas the genetic distance between pairs of populations will be large if they are geographically disparate
 - Patterns of regional variation and population structure in males and females will be different
 - Patterns of regional variation and population structure obtained using cranial dimensions will be the same as those obtained using body dimensions
- ❖ Secular Change in Body Size and Limb Proportions is present in Poland
 - Secular trends in males and females will be different
 - Secular trends in stature will primarily be due to change in the length of the lower limb rather than the length of the trunk
- ❖ Secular Change in Cranial Dimensions is present in Poland
 - Changes in Cephalic Index will primarily be due to change in cranial length rather than cranial breadth
 - Secular trends in cranial dimensions will not be as large or significant as that of body size and limb proportions

Population structure (subdivision) is when populations deviate from Hardy-Weinberg proportions when influences such as non-random mating, selection and/or gene flow are present. It is expected that population structure is present in Poland as significant assortative (non-random) mating has been demonstrated (Wolanski, 1975; Siniarska, 1984; Wolanski and Siniarska, 1984; Wolanski, 1994). According to a neutral or isolation by distance model it is expected that populations near each other are more genetically similar than populations that live further away. This is due to the tendency of individuals to find mates in nearby populations rather than more distant ones. A deviation from this pattern would indicate a more complicated migration, selection, and/or mate choice selection. Patterns of population structure and regional variation in this study have the potential to be different between males and females as Poland is a patrilocal society, meaning that females would be more mobile than males. It is assumed that this would be reflected in higher F_{ST} estimates in males as compared to females and has been demonstrated worldwide (Seielstad, et al., 1998; Prugnolle and de Meeus, 2002). As for patterns obtained using cranial versus body dimensions the assumption of no difference is employed. This is because the results obtained in previous studies are inconsistent (Jantz and Meadows, 1995; Relethford, 1997; Wescott and Jantz, 1999).

As the time period examined in this study represents a time of significant change in Poland so it is expected that secular trends would be present in both cranial and body dimensions. Differences in secular trends between the sexes are expected due to differences in growth, development and/or female “buffering” against negative environmental influences (Bogin, 1995). Previous research has indicated that secular trends in stature have primarily been due to changes in the length of the lower limb rather than the length of the trunk (Meadows and Jantz, 1995; Malina et al., 2004). It is assumed that the Polish population will also exhibit this trend. It is assumed that breadth measurements are more genetically constrained than length measurements so it is expected that changes in Cephalic Index will primarily be due to change in cranial length as shown in Jantz and Logan (2010). On this same vein cranial dimensions are also regarded as being more genetically constrained as compared to postcranial elements, and so it is also expected that secular change in cranial dimensions will not be as large or as significant as those found using body dimensions.

CHAPTER III

MATERIALS AND METHODS

This study used anthropometric data of Polish adults that were available to the author at the present time (Boas, 1928; Sikora, 1956; Stołyhwo et al., 1956; Miskiewicz, 1956; Miskiewicz, 1960; USHMM, 2008a). An in depth discussion of data sources, selection of anthropometric measurements and statistical methods follows.

Data Sources

The records of the Institute für Deutsche Ostarbeit (IDO) represent an anthropometric resource that has yet to be analyzed in a modern anthropological perspective. Included are forms with biographical, genealogical information, dermatoglyphics, medical data and anthropometrics (Schuster, 2007; USHMM, 2008a). The bulk of the collection is field data and analysis, including some data by Gottong and Plügel gathered before the founding of the IDO (Schuster, 2007; USHMM, 2008a). The field data series (2) is comprised of 23 subseries, each focusing on different localities (Schuster, 2007; USHMM, 2008a). Due to the vast nature of this resource it would be unrealistic to think that all possible aspects of this data set could be analyzed in a single dissertation. Instead, my dissertation will serve as the start of the analysis of the records of the IDO. My focus will be limited to analysis of anthropometric measurements in Series 2, subseries 1-4 and 6-7, combining these data with other Polish anthropometric data sources (Boas, 1928; Sikora, 1956; Stołyhwo et al., 1956; Miskiewicz, 1956; Miskiewicz, 1960) to assess regional variation, as well as change over time (secular trends).

Multiple data sources were used in the anthropometric analysis of the Polish population. To meet the goals of this study, individuals were selected from each data source using the following selection criteria. Individuals had to be of known sex, region, and age with recorded anthropometric measurements of interest (*selection of anthropometric measurements is discussed later in this chapter*). A map of Poland after the territory shifts resulting from World War II (Figure 3) and provides context for the map indicating where sources for raw data were obtained (Figure 4). An in depth discussion of each data source follows.

Series 2 from the Records of the Institut Für Deutsche Ostarbeit

Series 2 from the Records of the Institut Fur Deutsche Ostarbeit (IDO) contain anthropometric measurements of Polish individuals taken between 1940 and 1943 (Schuster, 2007). A copy of the original data sheets was obtained from The United States Holocaust Memorial Museum (USHMM, 2008a). These data sheets were predominantly

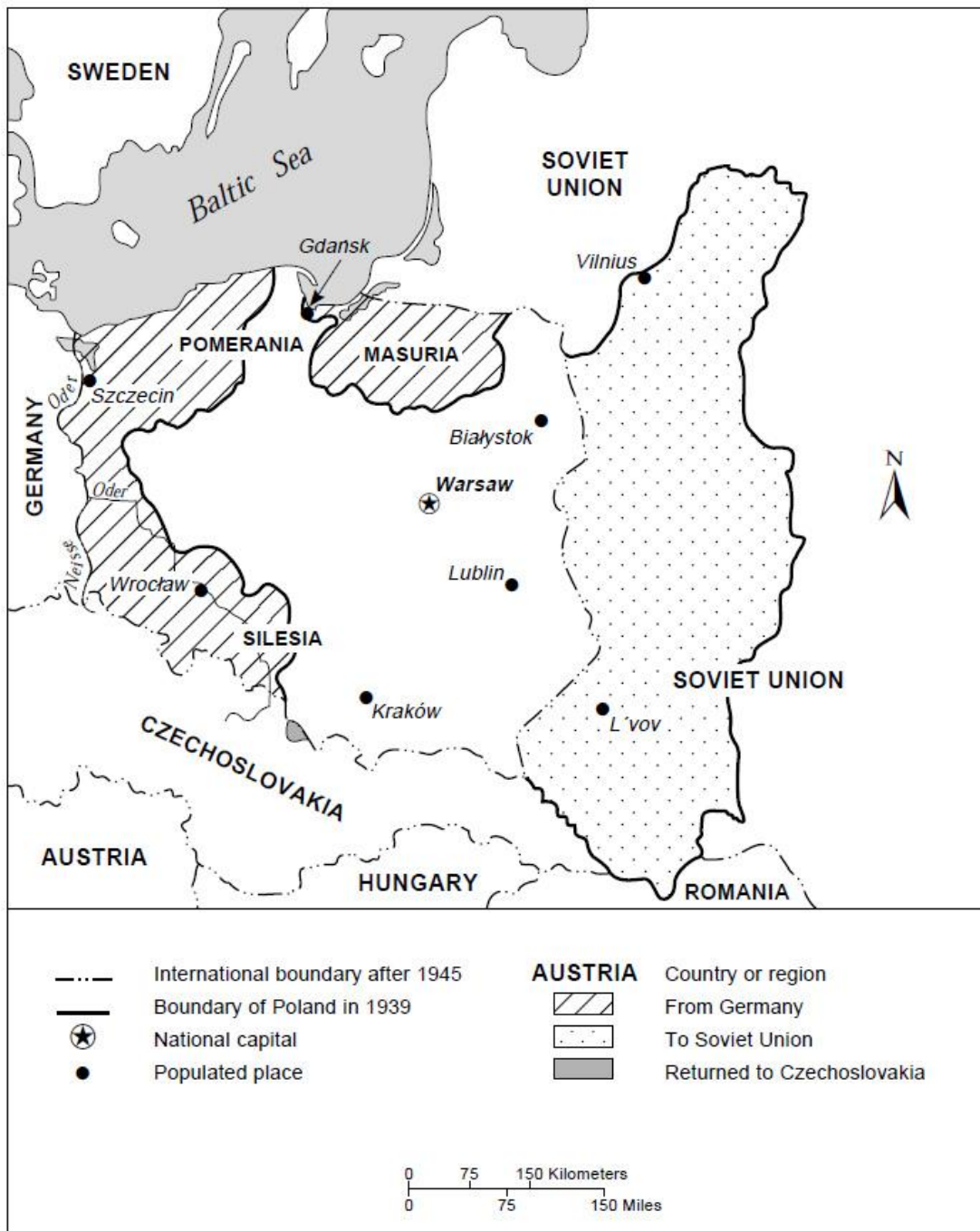


Figure 3. Poland 1945; Post World War II Territory Shifts (Curtis, 1994)

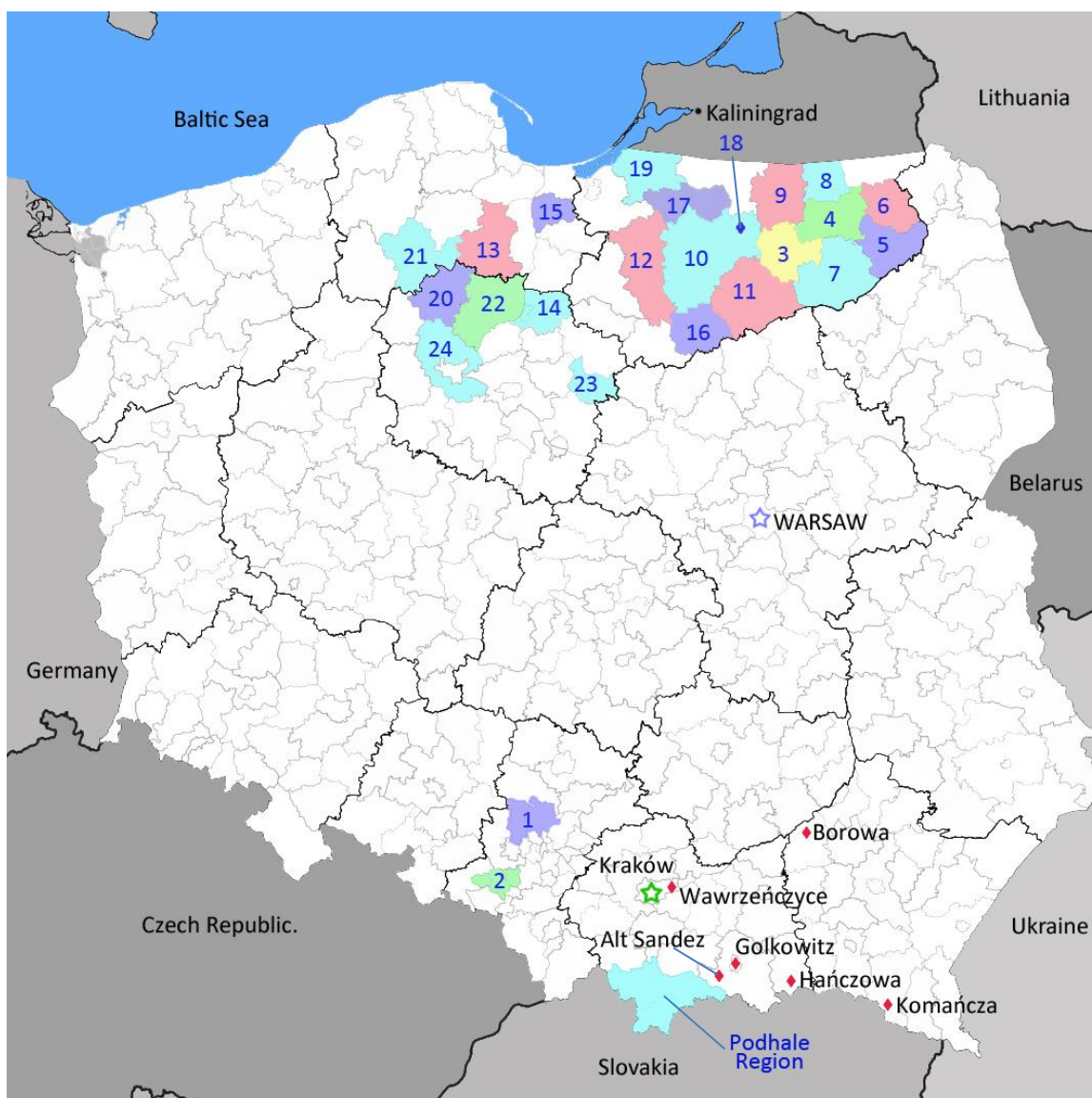


Figure 4. Map of Poland showing the location of data sources

Map modified courtesy of Jay Lanfear, with permission (Aotearoa, 2007). Counties are numbered and their names and sources are listed below. Cities marked with red dots, Krakow and the Podhale region indicate data sources from the IDO (USHMM, 2008a). Warsaw is the capital of Poland and provided for reference.

ID	County	Source	ID	County	Source
1	Tarnowskie Gory	Sikora, 1956	13	Starograd Gdanski	Miszkievicz, 1956
2	Rybnik	Stołyhwo et al., 1956	14	Grudziadz	Miszkievicz, 1956
3	Mragowo	Miszkievicz, 1956	15	Malbock	Miszkievicz, 1956
4	Gizycko	Miszkievicz, 1956	16	Szczycienski	Miszkievicz, 1956
5	Elk	Miszkievicz, 1956	17	Lidzbark Warminski	Miszkievicz, 1960
6	Olecko	Miszkievicz, 1956	18	Reszelski	Miszkievicz, 1960
7	Pisz	Miszkievicz, 1956	19	Braniewski	Miszkievicz, 1960
8	Wegorzewo	Miszkievicz, 1956	20	Tucholski	Miszkievicz, 1960
9	Ketrzyn	Miszkievicz, 1956	21	Chojnicki	Miszkievicz, 1960
10	Olsztyn	Miszkievicz, 1956 & 1960	22	Swiecki	Miszkievicz, 1960
11	Szczytno	Miszkievicz, 1956 & 1960	23	Rypinski	Miszkievicz, 1960
12	Ostroda	Miszkievicz, 1956	24	Bydgoski	Miszkievicz, 1960

hand written or in a format that prevented optical character recognition (OCR). A sample data sheet from each subseries used in this analysis is presented in Appendix A, Figures A-1 through A-8 (USHMM, 2008a). The information from each datasheet was manually entered into a Microsoft® Access® 2010 database and then exported into SAS® 9.3 and/or NCSS 2007 (Hintze, 2009) software for data analysis. Series 2 of the IDO is an anthropometric source comprised of 8 subseries, 5 of which are included in this analysis.

Subseries 1: Goralen 1940

The data contained in subseries 1 of the IDO are the result of anthropometric measurements taken of individuals residing in the towns of Koscielisko, Zakopane, Poronin and Nowy Bystre, the Podhale region, located in Województwo Małopolskie, the province of Little Poland (Figure 4). Individuals residing in the Podhale region are known as Górale, which translated into English, means highlanders or mountain people. Górale are a distinct ethnic group in Poland with their own traditions, customs and dialect. Although there is one Górale dialect, it varies regionally with individuals living in the Podhale region speaking the podhalańska subdialect. According to Schuster (2007) each of the 162 individuals was measured three times; however, there are only two copies of the completed form for each individual in the records obtained from USHMM (2008a). One copy was handwritten (Figure A- 1), whereas the other was typed. The recorded measurements (in mm) for each individual did not vary between the two forms; therefore a measure of inter- or intra-observer error was not possible using these data. The degree to which each form was completed varied from individual to individual, with young children and the elderly having the most incomplete forms.

The number individuals measured in this data series was 157, with 41 adult males and 35 adult females, and 43 boys and 38 girls. A summary of this data series is presented in Table A- 4 and Table A- 14 with an example of the data sheet provided in Figure A-1. This subseries will only be used in the analysis of secular change as individuals are from multiple towns within the Podhale cultural region without a large enough number of individuals from each town to facilitate analysis of regional variation at this level.

Subseries 2: Podhale 1940

Although catalogued as a separate data series, subseries 2 of the IDO is actually the missing third replicate from subseries 1. This was identifying after data entry, during data screening as the names, measurements were identical to those of subseries 1. As no new individuals or different measurement were present in this subseries it will not be used in subsequent analyses.

Subseries 3: Baudienst & Sonderdienst Studies 1941

The data contained in subseries 2 of the IDO are anthropometric measurements of Polish individuals selected for work in German labor camps that originated in Krakow during 1940 (Wróblewski, 1984). The dataset represents some individuals from Karkow; however, as the concept spread it appears the anthropologists seized the opportunity to gather more data and individuals from all over Poland are represented in this sample. The data contained in this subseries originates from 4 data collections, one in December 1940, March 1941, April 1941, and October 1941.

Although the form provided space to designate the sex of the individual this information was not filled out (Figure A- 2). Sex of the individual was determined by their photograph (if present), their first name (if legible), or the designation of profession (indicating a male) or maiden name (indicating a female). In instances where there was no photograph and the writing was illegible, reliance on the presence or absence of information for profession / maiden name introduces a source of error into these data. With the handwriting being illegible it prevents discerning whether a profession or maiden name is provided on the form, and as such the author is relying on this information being written in separate locations designated within a single box. On other forms, such as those used in subseries 1 and 2, this information was provided for in the same place without any labels. One way of ensuring that the correct sex was attributed to each individual was by also looking at the information provided for the individual's father. Even if illegible, if the same word appeared in the maiden name section and the father's name then it was logical to assume that the individual was female. Additionally, children tend to be listed on the fathers form as opposed to the mothers form in cases where both were measured.

The number of individuals measured in this data series was 337, with 270 adult males and 41 adult females, and 26 boys. . A summary of this data series is presented in Table A- 5 and Table A- 15 with an example of the data sheet provided in Figure A- 2. This subseries will only be used in the analysis of secular change as individuals are from multiple regions of Poland without a large enough number of individuals from each area to facilitate analysis of regional variation.

Subseries 4: Charków 1942

The data contained in subseries 4 of the IDO are the result of anthropometric measurements taken in 1942 of Polish individuals residing in Charków, present day Ukraine (Figure 5; Figure A- 3; Figure A- 4). This dataset represents the most geographically disparate population of Polish individual in this analysis. It is unclear how the investigators determined that these individuals were Polish, as all but 4 individuals measured were born and resided in Charków (Figure A- 3). It is possible that a migrant community was identified through retention of Polish language and customs. The number of individuals measured in this data series was 165, with 73 adult males and 90 adult females, 2 girls. . A summary of this data series is presented in Table A- 6 and

Table A- 16 with an example of the data sheet provided in Figure A- 3 and Figure A- 4. This subseries will be treated as one population and used in analysis of both geographic variation and secular change.

Subseries 6: Kraków 1942

The data contained in subseries 6 of the IDO are the result of anthropometric measurements taken in June, 1942 of individuals at a delousing station in Kraków. It is not known whether these individuals were in transit, in labor camps or migrants to Kraków. Relatively few individuals were born in Kraków and no information was provided as to where they resided. Individuals from as far as Warszawa, Rzeszów and Lublin are present in this sample. As individuals are from multiple regions of Poland without a large enough number of individuals from each area to facilitate analysis of regional variation it will only be used in the analysis of secular change. The number of individuals measured in this data series was 576, with 335 adult males and 231 adult females, 8 girls and 2 boys. A summary of this data series is presented in Table A- 5 and Table A- 15 with an example of the data sheet provided in Figure A- 5 and Figure A- 6.

Subseries 7: Anthropologische Erhebungsblätter 1942-3

The data contained in subseries 7 of the IDO are the result of anthropometric measurements taken during 1942 and 1943 in 6 towns located in Southern Poland. The anthropometric form used in this series was developed by Anton Plugel (Schuster, 2007). Although the form allows for the recording of over 100 variables, only 39 were collected from most individuals. Some individuals measured in Hanczowa are identified as being Lemkos. The Lemkos are a unique cultural group that lived on the Polish-Slovak border in southeastern Poland (Rieger, 1995). The Lemkos speak a distinctive Ukrainian dialect and have their own distinctive customs and culture (Rieger, 1995). After World War II most Lemkos were resettled to the Soviet Ukraine, with only a few small groups allowed to remain (Rieger, 1995). Other ethnic groups represented in this sample include Poles and Ukrainians. How individuals were classified as Pole, Ukrainian or Lemko is unclear as all individuals measured in this subseries were born and resided in Poland. The number of individuals measured in this data series was 1902, with 885 adult males and 1017 adult females. This subseries will be treated as six populations and used in analysis of both geographic variation and secular change. A summary of this data series is presented in Table A- 7, Table A- 8, Table A- 17 and Table A- 18 with an example of the data sheet provided in Figure A- 7 and Figure A- 8.

Zdjęcie Antropologiczne Śląska – Powiat Tarnowskie Góry (Sikora, 1956)

The anthropological survey of Silesia, district (county) of Tarnowskie Góry was conducted from 1934 to 1939 and from 1946 to 1947 by the Department of

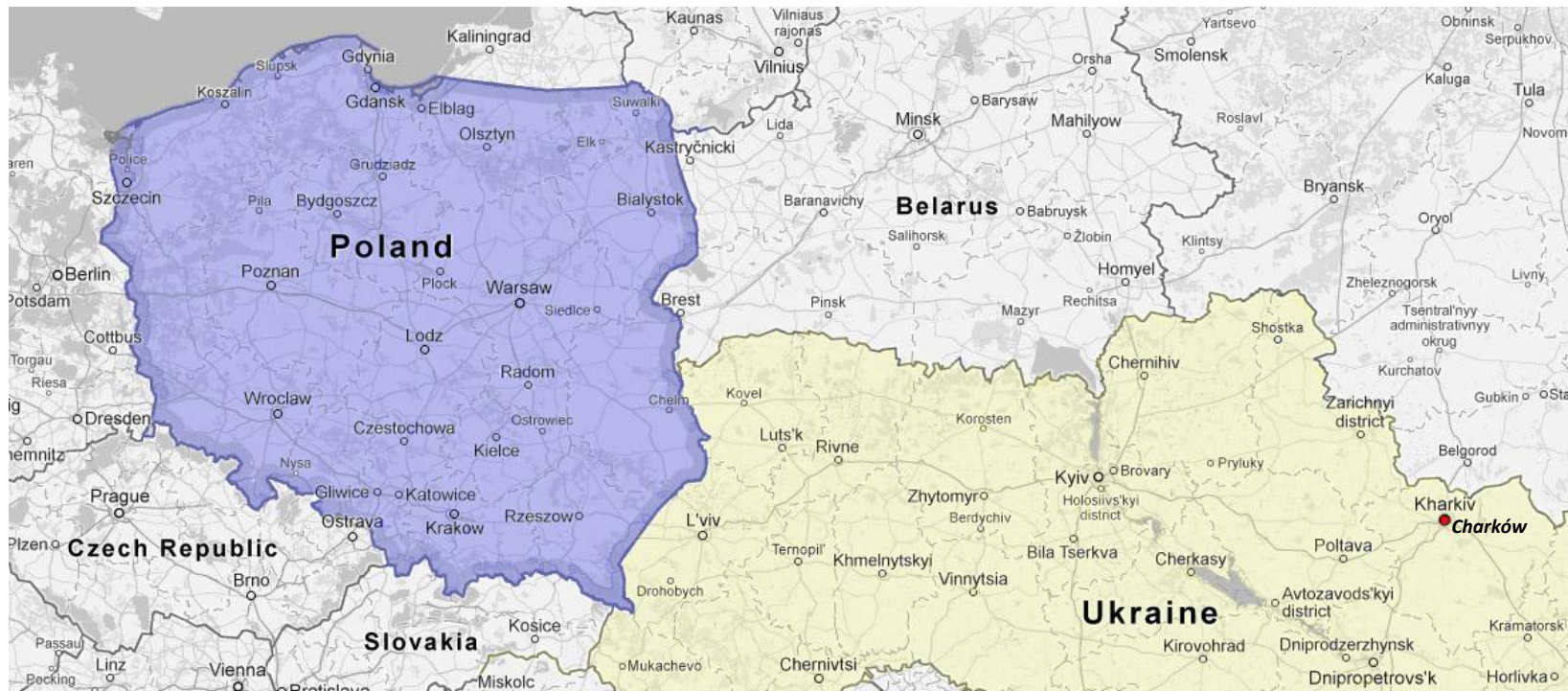


Figure 5. Map of Poland and the Ukraine with the location of Charków (Kharkiv in Ukrainian). Map Modified from Google Maps.

Anthropology at the Jagiellonian University, supported by grants from the Polish Academy of Sciences. In this study approximately 50 adult males and 50 adult females were measured from 24 villages from the district of Tarnowskie Góry for a total of 1069 males and 1060 females. The raw data for each of the 24 variables collected is presented in Sikora (1956) and was transferred into a Microsoft® Excel® spreadsheet using a combination of optical character recognition (OCR) and manual data entry. The number of individuals measured in this data series was 2,129, with 1,069 adult males and 1,060 adult females (Table A- 9 and Table A- 19). This subseries will be used in conjunction with data from Rybnik (Stołyhwo et al., 1956) to analyze population structure at the level of municipality in Poland. As year of birth was not provided and the data was collected over several years (not able to calculate year of birth from age) these data will not be used in the analysis of secular change.

Zdjęcie Antropologiczne Śląska – Powiat Rybnicki (Stołyhwo et al., 1956)

The anthropological survey of Silesia, district (county) of Rybnik was conducted from 1934 to 1939 and from 1946 to 1947 by the Department of Anthropology at the Jagiellonian University, supported by grants from the Polish Academy of Sciences. In this study adult males and adult females were measured from 99 villages and 3 cities, for a total of 102 municipalities, from the district of Rybnik and a total of 5417 males and 5247 females (Table A-10 and Table A-20). There is a discrepancy between the published total number of individuals and the raw data that were published with only 5417 males as opposed to the published 5609. The raw data for each of the 24 variables collected is presented in Stołyhwo et al. (1956) and was transferred into a Microsoft® Excel® spreadsheet using a combination of optical character recognition (OCR) and manual data entry. This subseries will be used in conjunction with data from Rybnik (Sikora, 1956) to analyze population structure at the level of municipality in Poland. As year of birth was not provided and the data was collected over several years (not able to calculate year of birth from age) these data will not be used in the analysis of secular change.

Struktura Antropologiczna Mazurów (Miskiewicz, 1956)

The anthropological survey of the province of Mazury was conducted in June 1954 by Brunon Miskiewicz (1956). The province of Mazury is located in Northern Poland and has an interesting colonization pattern (Figure 7). The land was originally inhabited by Old Prussians and from the 13th century the land was colonized by the Poles (Miskiewicz, 1956). Relatively few Germans lived in the area; however, German colonization steadily increased from the 17th century (Miskiewicz, 1956). In 1726 King Fryderyk Wilhelm had declared Polish to be the official language of the land and German colonization ceased (Miskiewicz, 1956). During World War II in an effort to

demonstrate German ties to Mazury, Hitler made the Polish language illegal and even changed the names of Polish cities (Miskiewicz, 1956).

In this study adult males and adult females were measured from 11 counties for a total 610 individuals, 174 males and 437 females (Table A- 11, Table A- 21). Additionally Miskiewicz (1956) obtained a sample 95 individuals, 30 males and 65 females from the Anthropometry Commission of the Presidium Polish Academy of Sciences. These additional data were obtained in Wrocław during 1955 and represent immigrants from 9 counties within the Mazury region. Overall the sample is overrepresented by females due to the casualties of World War II (Miskiewicz, 1956). Data for height is missing for some individuals typically in those older in age (approx. 69+). The raw data for each of the 13 variables collected is presented in Miskiewicz (1956) and was transferred into a Microsoft® Excel® spreadsheet using a combination of optical character recognition (OCR) and manual data entry. This subseries will be treated as 11 counties and used in analysis of both geographic variation and secular change.

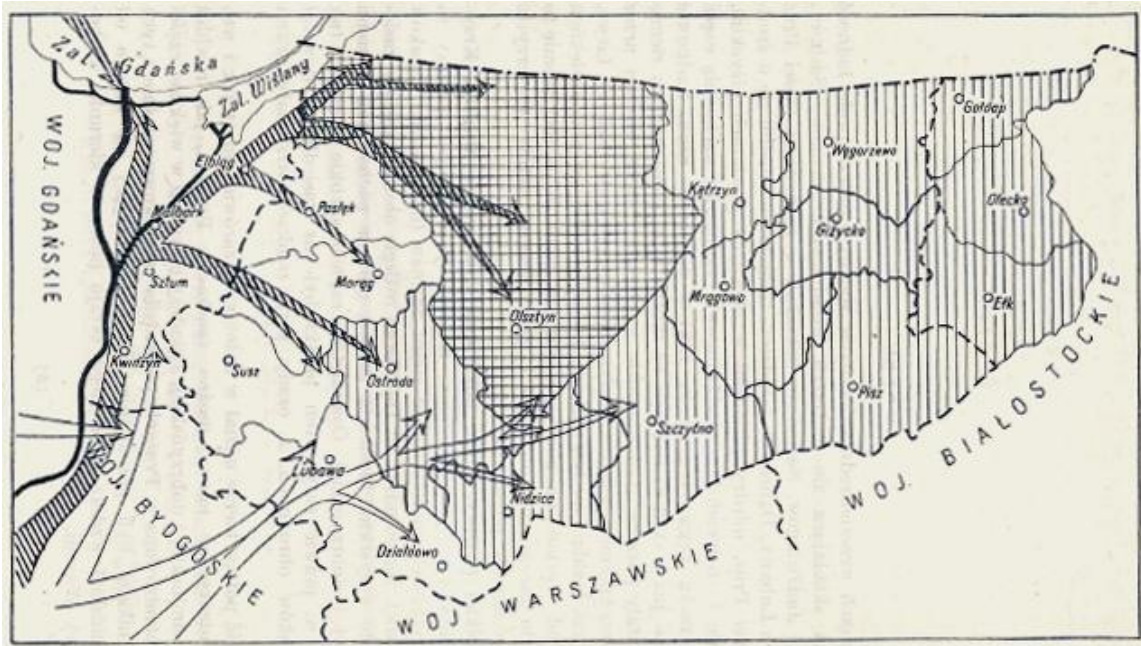


Figure 6. Migration Patterns of Polish (open arrows) and German (filled arrows) people from the 13th to 15th centuries into the Mazury (are filled with grid pattern) and Warmia (area filled with vertical lines) area (Miskiewicz, 1956).

Struktura Antropologiczna Warmii (Miskiewicz, 1960)

The anthropological survey of several counties in the province of Warmia was conducted from 1954 to 1956 by Mydlarski and Miskiewicz. In this study adult males and adult females were measured from 10 counties in Warmia for a total of 974 individuals, 497 males and 477 females (Table A- 12, Table A- 22). The raw data for each of the 15 variables collected is presented in Miskiewicz (1960) and was transferred into a Microsoft® Excel® spreadsheet using a combination of optical character recognition (OCR) and data manual entry. This subseries will be treated as 10 counties and used in analysis of both geographic variation and secular change.

Boas' Immigrant Study (Boas, 1928)

A subset of Boas' immigrant study was used in this research. It includes Polish born immigrants to the United States that were 18 years or older at the time of anthropometric study (Table A- 13, Table A- 23). Individuals with data missing for either stature or cephalic index were omitted. This group was then subdivided into Polish born males (n=110) and females (n=144). These data will be used in the analysis of secular change but not for analyses of regional variation because this sample represents individuals from various regions in Poland.

Selection of Anthropometric Measurements

As one can now appreciate the datasets used in this analysis are not uniform and more importantly, don't necessarily contain all of the anthropometric measurements present in other datasets. Therefore, selection of anthropometric measurements for analysis in this study was first dependent on which datasets were being used. Definitions for each measurement used and its assigned three letter code can be found in Table A- 1 (Appendix B). The methods of selection of anthropometric measurements will be presented by each type of analysis performed.

Selection for Analysis of Regional Variation

The datasets that allowed for the analysis of regional variation include IDO subseries 1, 4, and 7 (USHMM, 2008a) as well as Rybnik (Stołyhwo et al., 1956), Tarnowskie Gory (Sikora, 1956), Mazury (Miskiewicz, 1956) and Warmia (Miskiewicz, 1960). Three levels of analysis will be conducted, at the town, municipality and county levels. For each level the dataset was screened for missing values resulting at times in a subset of populations and variables being analyzed (Table 1). More specifically, for males in the county dataset (Warmia and Marzury) only 5 out of the total 22 represented had enough individuals for analysis. There was more data available for females; however for consistency the same 5 counties were used in the analysis of

Table 1. Populations and Variables Selected for the Analysis of Regional Variation. 3 letter variables codes are defined in Table A- 1.

Level	FEMALES			MALES			Data Source
	Number of Groups	Total number of individuals	Variables	Number of Groups	Total number of individuals	Variables	
Town	7	900	10 Total 2 Body: HGT SHB 8 Cranial: BIB FAH MCB MCL NAB NAH WFB ZYG	7	857	10 Total 2 Body: HGT SHB 8 Cranial: BIB FAH MCB MCL NAB NAH WFB ZYG	USHMM, 2008a
Municipality (Gmina)	122	5,757	13 Total 6 Body: ACH DAH HGT ICB SHB STH 7 Cranial: ZYG FAH MCB MCL NAB NAL NPH	123	5,939	14 Total 7 Body: ACH DAH HGT ICB PUH SHB STH 7 Cranial: ZYG FAH MCB MCL NAB NAL NPH	Stołyhwo et al., 1956; Sikora, 1956
County (Powiat)	5	522	10 Total 1 Body: HGT 7 Cranial: FAH MCB MCL NAB NAL NPH ZYG	5	358	10 total 1 Body: HGT 7 Cranial: FAH MCB MCL NAB NAL NPH ZYG	Miskiewicz, 1956 & 1960

females. Additionally, the municipality of Nowa Wies had to be removed from the municipality analysis as it was represented by only a few individuals. Analysis of females in the municipality dataset did not include pubic height as too many missing values were present. The male dataset for municipality (Adamowicz) contained data from a municipality where there was no data obtained for females resulting in the analysis of 123 municipalities for males, while 122 for females.

Selection for Analysis of Secular Trends

The datasets that allowed for the analysis of secular change include all IDO subseries (USHMM, 2008a), Mazury (Miskiewicz, 1956), Warmia (Miskiewicz, 1960) and the Boas data (1928). The variables originally selected for analysis are ones which have been shown to exhibit secular trends; however, adequate sample sizes were not present for all of them (Table 2). Unfortunately although cranial height has been shown to be the most significant cranial measurement to demonstrate secular trends, this sample is very limited in the number of individuals that were measured for this, and other significant variables (Table 2). Analysis of secular trend will involve the use of 3 body and 4 cranial dimensions (Table 2).

Statistical Methods

Many multivariate statistical methods have been employed in the anthropometric analysis of the Polish population. Multivariate methods allow for the simultaneous consideration, analysis and interpretation, of all (or a subset) of the anthropometric measurements (variables) selected (Huberty and Olejnik, 2006). What follows is an explanation of each method used including the method's purpose, assumptions, and limitations. The outcome or results of each method will be presented in Chapter 3.

Data Screening

There are various assumptions that need to be met in order to run multivariate analyses. Data screening allows one to understand the dataset and ensure assumptions are met. One of the main purposes of data screening is to flag observations that are not possible, those due to data entry errors, but also to identify outliers. Data screening also identifies where data values are missing, allowing us to deal with these missing values. Tests of normality, equality of covariance matrices and residuals during data screening ensure that the assumptions of the proposed analyses are met.

Table 2. Variables Selected for the Analysis of Secular Change, 3 letter variables codes are defined in Table A- 1.

FEMALES			MALES		
Variable	N	Year of Birth Range	Variable	N	Year of Birth Range
HGT	2,244	1852-1937	HGT	2,198	1851-1936
SIH*	127	1872-1924	SIH*	384	1869-1923
COI*	127	1872-1924	COI*	384	1869-1923
SHB	1,360	1862-1924	SHB	1,587	1862-1924
PEB*	245	1872-1924	PEB*	356	1869-1924
LLL	935	1862-1924	LLL	963	1865-1924
TLI*	127	1876-1923	TLI*	127	1891-1922
CEI	2,416	1852-1937	CEI	2,300	1851-1936
CRH*	111	1885-1924	CRH*	360	1880-1923
ZYB	2,430	1852-1937	ZYB	2,308	1851-1936
MCL	2,419	1852-1937	MCL	2,300	1851-1936
MCB	2,416	1852-1937	MCB	2,302	1851-1936

Asterisk () indicate variables not used due to small sample size.*

Measurement Error

This dataset is comprised of measurements taken by multiple observers and contains an unknown amount of measurement error. In this analysis it is assumed that the error contained in this data set due to multiple observers and measurement error is random. Although random measurement error does not bias the expected value of a variable it does inflate its variance. Therefore, the accuracy (how close the observed is to the true value) of the measurement may not be affected, but the precision (how close repeated measures) is. While methods exist to deal with issues of unknown measurement error they will not be employed in the current analysis.

Regional Variation and Population Structure

This dataset provides the opportunity to assess regional variation on a genetic basis using the *R* matrix.

Population Structure Analysis (RMET 5.0, Custom Version)

Population-genetic parameters can be derived using quantitative traits and the extension of *R* matrix theory (Williams-Blangero and Blangero, 1989; Relethford and Blagero, 1990; Relethford et al., 1997; Relethford, 2002). After Z-score standardization of the data matrix the minimum *R* matrix can be calculated. For “metric traits for *g* groups based on *t* traits it is a function of the codivergence matrix *C*

$$\begin{aligned} c_{ij} &= (x_i - \mu)'P^{-1}(x_j - \mu) \left(\frac{1}{2}t\right) \\ &= \Delta_i'P^{-1}\Delta_j \left(\frac{1}{2}t\right) \end{aligned}$$

where x_i and x_j are the mean vectors for groups *i* and *j*, μ is a vector of total means over all groups, *P* is the pooled within-group phenotypic covariance matrix, and the prime indicates transposition. Δ_i and Δ_j are the deviations of group means from the total means. Both *P* and the total means are computed by weighting by relative population size (w_i) (Relethford et al., 1997:459). The minimum *R* matrix is then defined as

$$R = C(1 - F_{ST})$$

The average diagonal element of the *R* matrix is an estimate of Wright's F_{ST} , which “can be defined as a ‘fixation index’, or the decrease in total heterozygosity relative to expected heterozygosity. It can also be defined as one-fourth of the genetic distance between a pair of populations or as a probability of identity by descent” (Mielke et al., 2006:77). Put simply, F_{ST} is the proportion of variation attributed to population subdivision, or a measure of how different two subpopulations are.

All R matrix calculations were performed with a custom version of RMET 5.0 authored by Relethford (2012) with all of the samples in the analysis weighted equally (considered an unscaled R matrix). The derivation of the computations made with RMET 5.0, namely minimum F_{ST} , minimum R matrix, genetic distances and their standard errors and corrections for sampling bias are provided in Relethford et al. (1997:459-463). With this model of genetic structure it is assumed that the traits are selectively neutral and with the use of quantitative traits it requires the knowledge of either the additive genetic covariance matrix or the heritabilities of individual traits (Relethford and Blangero, 1990). However, as shown in Relethford and Blangero (1990:23) the methods used in RMET 5.0 are “quite robust to imprecise knowledge of the underlying patterns of genetic inheritance”.

Secular Change

This dataset provides the opportunity to assess secular change over 70 years and is organized into X year birth cohorts approximately equal in size. As there is a significant time component to these data time series methods will be employed in the analysis of secular change. Time series should be used in the analysis of secular change because these methods are able to account for the potential internal structure due to the time component of these data. The internal structure of a time series can contain the following components, trend, seasonality, cyclical, irregular and autocorrelation. Trend in a time series is a slowly evolving change at the level of the entire series, typically caused by long-term population changes (DeLurgio, 1998). A time series contains seasonality if there are periodic or recurrent changes in the series, such as monthly changes recurring each year (DeLurgio, 1998). A recurrent change can also indicate a cyclical component to a series unlike seasonality it is not periodic; meaning that the spacing between occurrences are irregular rather than a fixed interval such as day of the week (DeLurgio, 1998). Any erratic movement in a series that lacks a recognizable pattern is considered irregular. In order to detect an irregular component to a series the first three components need to have been modeled and extracted from the series. In a sense the irregular component can be thought of as the residual of the model once all other factors have been accounted for. Autocorrelation is said to be present when the value of a series in one time period is related to the value of itself in previous periods (DeLurgio, 1998). As one can appreciate even the momentum of series can be responsible for autocorrelation in that values tend to be related to or build on past values (DeLurgio, 1998). Not all data series contain all of these components. It is expected that the data used in the analysis of secular change in the current study will contain a significant trend, with little seasonal or cyclical components. Although the Irregular is typically not modeled, it is informative in that the residuals may indicate events that deviate significantly from the proposed model, where something occurs to change the series at a specific point in time.

The following models will be used in the analysis of secular change, and although one model may outperform others the process of model selection is just as an important and informative process as is presenting the best performing model.

Time Series Regression

Regression methods predict future values by modeling past relationships between a dependent and one or more independent or predictor variables. The resulting model also tests the degree of association between the dependent and independent variables. There are six main assumptions made by in regression analysis starting with the assumption that the fitted relationship is the correct form and should include all important variables, meaning that if a linear regression is fit the population relationship should also be linear otherwise the model will be misleading (DeLugio, 1998). In regression the model errors are assumed to be homoscedastic, meaning that there is equal scatter about the regression line. The errors should also be free of serial correlation, meaning that the residuals in one time period should not be relation to those in other periods and should be normally distributed. Finally the independent variables should not be highly correlated. In practice these assumptions are hard to achieve; however unlike ARIMA and exponential smoothing models there are robust regression methods that are available in mainstream software packages.

Exponential Smoothing Models

This is a method that employs exponentially weighted moving averages (exponential smoothing). Smoothing constants determine the weight given to the most recent past observations, by doing it requires less data than other simple time series models. In essence the smoothing constant, α , controls the rate of smoothing or averaging that is present in the model (DeLurgio, 1998). Brown's double exponential smoothing method uses the single coefficient in both smoothing operations. Holt's double exponential smoothing is different from other exponential smoothing methods in that it is a two-parameter double exponential smoothing model uses a smoothing constant, θ , to separately smooth the trend (DeLurgio, 1998). By doing so this model as the potential to more accurately model situations where there is a changing trend. Both of these models only consider the trend component of a time series, and are not appropriate if seasonality is present in the series. As it is anticipated that the data analyzed will be free of any seasonal component these two models provide a simple means to model and determine whether a significant trend is present in the series. One disadvantage to the use of these models is that they require a starting value to initialize the formulas. In situations where there is little historical data these model will be greatly influenced by the choice of initialization procedure (DeLurgio, 1998).

ARIMA

An ARIMA model has 3 components; AutoRegressive, Integrated and Moving Average. ARIMA models are identified by a simple model notation that indicates the order of each of the three components of ARIMA; (p, d, q) where p is the order of autoregression, d is the order of integration or differencing and q is the order of moving average. The goal of ARIMA modeling is to identify the order of each of these three components such that the model's residuals are distributed as white noise (without any remaining pattern as determined by the Q statistic). A trial and error approach is typically taken to ARIMA although some statistical software packages like SAS are able to automatically detect the appropriate ARIMA model for a data series; however, this type of software does have limitations. For example, SAS will not fit an ARIMA model where the order of the autoregressive component is not one more than that of the moving average, with the only exception being the (1,0,1) model. As such automatic ARIMA methods should be used to as a starting point and several ARIMA models should be tested for fit as there can be more than one model that performs well; however, it is best to stick with the simplest model when possible. ARIMA models tend to require a lot of data in order to detect patterns particularly if they are not strong and obvious. While ARIMA models are probably one of the most accurate class of forecasting methods it does not provide interpretable coefficients; however, it does provide information about the components of the series that may help in fitting other models that provide parameter estimates.

CHAPTER IV

ANTHROPOMETRIC ANALYSIS

Data Screening

First the data was screened for impossible values. Data entry errors were corrected and values due to measurement error were removed. Despite this data screening, a significant number of outliers remain in the dataset although no significant pattern to them is present. Missing data was not estimated and observations with missing values were not included in this analysis. Most of the time missing values are due to the nature of this composite data series where they are not missing at random; rather they are missing because they were never collected for a particular subset of the data series. As such estimating these values would prove to be a difficult task one which will be addressed in future research involving this data series.

Regional Variation

Population Structure

The analysis of population structure was conducted using a customized version of RMET 5.0 (Relethford, 2012) with graphs generated using NCSS 2007 (Hintze, 2009) at three levels, town, municipality and county; corresponding to the level at which these data were collected. As information on actual population size was not available the calculated F_{ST} values reflect equal weighting. Results are presented by level of analysis.

Town

Overall the analysis of population structure indicates that there is significant amount of differentiation between the 7 towns in this analysis (Female Min F_{ST} = 0.022581; Male Min F_{ST} = 0.021509; Table 3; Table 4). It appears that high levels of gene flow is present in all of these towns as the $r(ii)$ values are very low, while the within-group phenotypic variances are very high (Table 5). Wawarzenyzyce appears to have relatively less gene flow than the other 6 towns as the observed within-group phenotypic variation is consistently lower than expected (Table 5). The within group phenotypic variation is high in some populations such as Golkowitz which has the highest variance at 1.15, higher than expected indicating that gene flow is higher here than in the other 6 towns (Table 5). Although the data was screened for outliers there is a possibility that there is still a significant source of error in these data, particularly in the Golkowitz sample. Development of robust methods of estimating the R matrix could prove useful to further evaluate this. The graph of the principle coordinates analysis of the R matrix (Figure 7; Figure 8; Figure 9) shows the most geographically disparate town,

Table 3. Results of *R* matrix for Females in 7 Towns

	<i>Min F_{ST}</i>	<i>Standard Error</i>	<i>Confidence Interval Min F_{ST}</i>	<i>Unbiased Min F_{ST}</i>	<i>Mean within group phenotypic variance</i>	<i>Non-zero eigenvalues</i>	<i>First Eigenvalue</i>	<i>Second Eigenvalue</i>
Female all	0.022581	0.002584	0.017413-0.027749	0.0189092	0.958	5	53.5%	22.1%
Female head	0.023485	0.002934	0.017617-0.029353	0.0189960	0.953	4	52.1%	22.3%
Female body	0.023630	0.005981	0.011668-0.035592	0.0195440	0.978	2	66.4%	33.6%

Table 4. Results of *R* matrix for Males in 7 towns

	<i>Min F_{ST}</i>	<i>Standard Error</i>	<i>Confidence Interval Min F_{ST}</i>	<i>Unbiased Min F_{ST}</i>	<i>Mean within group phenotypic variance</i>	<i>Non-zero eigenvalues</i>	<i>First Eigenvalue</i>	<i>Second Eigenvalue</i>
Male all	0.021509	0.002403	0.016703-0.026315	0.016861	0.975	5	56.8%	17.3%
Male head	0.017185	0.002325	0.012535-0.021835	0.012537	0.970	4	44.3%	24.6%
Male body	0.041688	0.007684	0.026320-0.057056	0.037507	0.992	2	84.9%	15.1%

Table 5. Relethford-Blangero Analysis of 7 Towns

		<i>FEMALES</i>				<i>MALES</i>			
Variables	Population	r(ii)	Observed	Expected	Residual	r(ii)	Observed	Expected	Residual
All	Charkow	0.040461	0.910	0.936	-0.026	0.051363	0.977	0.940	0.037
	Hanczowa	0.020709	1.049	0.955	0.093	0.014085	0.969	0.977	-0.008
	Komancza	0.020368	0.900	0.956	-0.056	0.007901	0.948	0.984	-0.036
	Golkowitz	0.023501	0.922	0.953	-0.03	0.005719	1.072	0.986	0.087
	Alt Sandez	0.007992	0.997	0.968	0.03	0.003457	0.913	0.988	-0.075
	Borowa	0.008198	1.028	0.968	0.061	0.013548	1.016	0.978	0.038
	Wawrzencyce	0.005418	0.899	0.970	-0.071	0.021951	0.926	0.97	-0.044
Cranial	Charkow	0.039037	0.923	0.933	-0.011	0.018399	1.004	0.965	0.039
	Hanczowa	0.024915	1.036	0.947	0.088	0.010663	0.908	0.972	-0.065
	Komancza	0.024494	0.908	0.948	-0.04	0.010588	0.882	0.972	-0.091
	Golkowitz	0.026441	0.865	0.946	-0.08	0.00764	1.086	0.975	0.111
	Alt Sandez	0.004637	0.991	0.967	0.024	0.002718	0.927	0.980	-0.053
	Borowa	0.009375	1.022	0.962	0.06	0.017112	1.044	0.966	0.079
	Wawrzencyce	0.004074	0.926	0.967	-0.041	0.020643	0.943	0.962	-0.020
Body	Charkow	0.051308	0.858	0.946	-0.088	0.182734	0.872	0.842	0.03
	Hanczowa	0.026035	1.101	0.971	0.130	0.041886	1.217	0.987	0.23
	Komancza	0	0.868	0.997	-0.129	0	1.214	1.030	0.183
	Golkowitz	0.019768	1.150	0.978	0.172	0.000912	1.019	1.029	-0.011
	Alt Sandez	0.026859	1.022	0.971	0.052	0.006656	0.858	1.023	-0.165
	Borowa	0	1.054	0.997	0.057	0.006184	0.904	1.024	-0.120
	Wawrzencyce	0.012836	0.792	0.985	-0.193	0.024175	0.858	1.005	-0.147

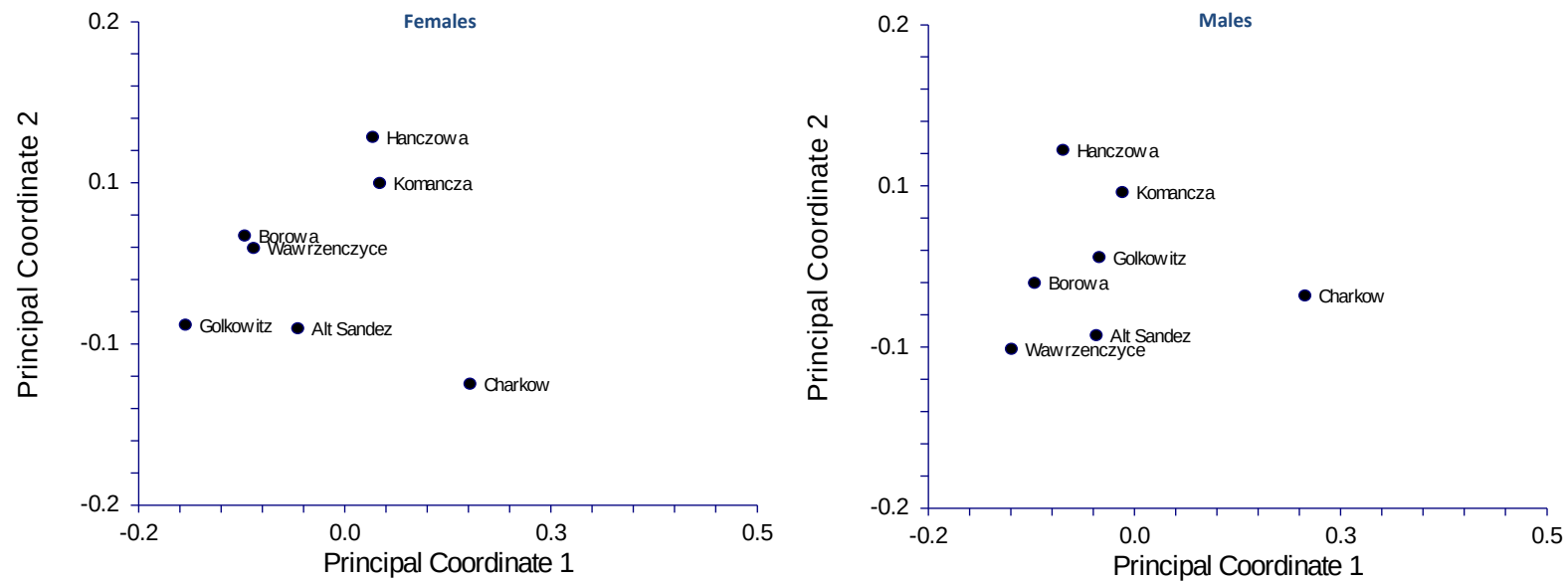


Figure 7. Principle Coordinate Analysis of *R* Matrix for Analysis at the Level of Town Using All Variables.

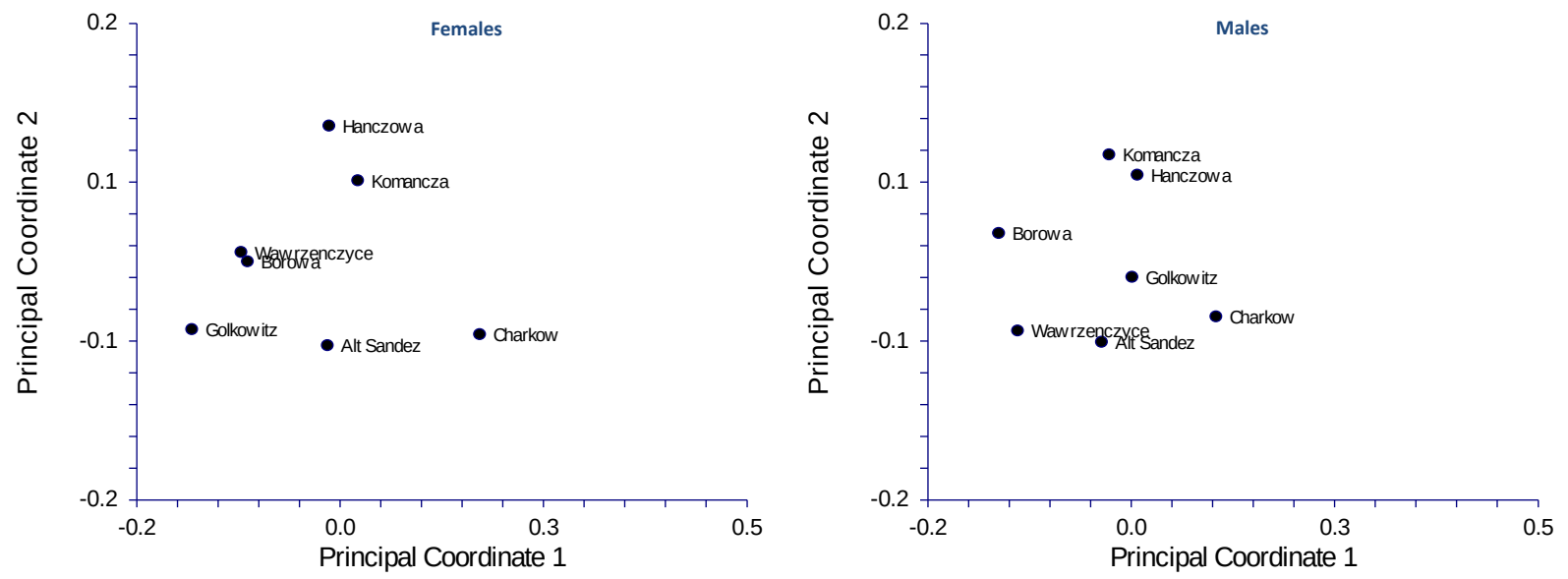


Figure 8. Principle Coordinate Analysis of *R* Matrix for Analysis at the Level of Town Using Cranial Dimensions.

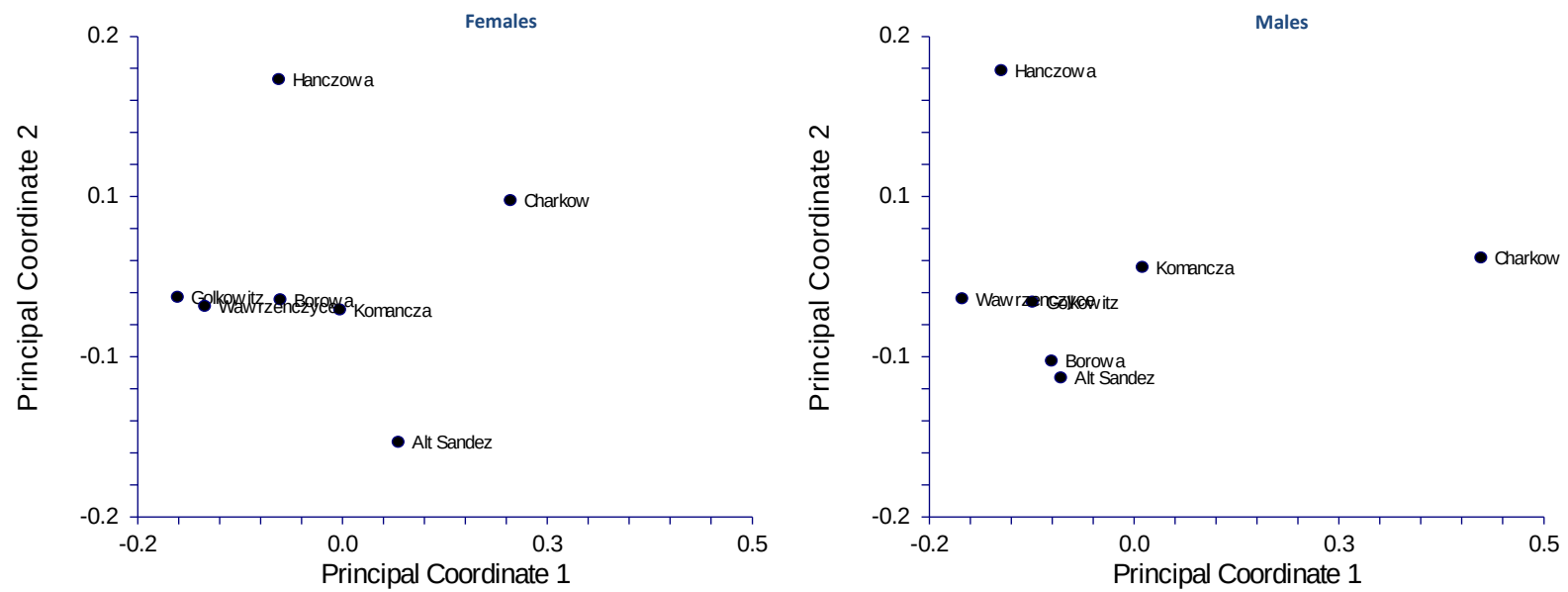


Figure 9. Principle Coordinate Analysis of *R* Matrix for Analysis at the Level of Town Using Body Dimensions

Charkow (Figure 5) is consistently distant from the other 6 towns. It also shows that the remaining six towns tend to group together in pairs roughly corresponding to geographic proximity (Figure 4; Figure 7; Figure 8; Figure 9). The PCA analysis of the R matrix indicated that there is a difference between the sexes in the magnitude of differentiation between the pair of towns, Borowa and Wawrzencyce (Figure 7; Figure 8; Figure 9) with the difference in males being more pronounced. Otherwise the PCA analysis of the R matrix demonstrates a pattern of differentiation that is similar between the sexes and roughly follows geographic distance (Figure 7; Figure 8; Figure 9). No significant differences in $\text{Min } F_{ST}$ are present between the sexes (Table 3; Table 4). At first glance it appears that there is a difference between the Male $\text{Min } F_{ST}$ for body dimensions (0.041688) and that of females (0.23630); however when the confidence intervals are calculated for each estimate ($\text{Min } F_{ST} \pm \text{Standard Error} \times 2$; Table 3; Table 4) they overlap (Males = 0.026320-0.057056; Females = 0.011668-0.035592) indicating that the difference is not statistically significant. As for differences in $\text{Min } F_{ST}$ estimated obtained from cranial versus body dimensions (Table 4; Table 5), there is only a significant difference between these in males (Cranial Confidence Interval = 0.012535-0.021835; Body Confidence Interval = 0.026320-0.057056). Overall males have higher mean within group variance estimates than females, and body dimensions in both sexes have higher within group variance estimates than those obtained using cranial dimensions (Table 3; Table 4).

Municipality (Gmina)

Overall the analysis of population structure indicates a significant amount of differentiation between the 123 municipalities in this analysis (Female $\text{Min } F_{ST} = 0.047551$; Male $\text{Min } F_{ST} = 0.046790$; Table 6; Table 7). Overall the amount of differentiation between municipalities is greater than that observed in the analysis of towns ($\text{Min } F_{ST} = 0.022581$ and counties ($\text{Min } F_{ST} = 0.020473$), with the exception of male body dimension in the town analysis ($\text{Min } F_{ST} = 0.041688$). The between municipality differentiation ($\text{Min } F_{ST}$) is larger in cranial measurements than that of body measurements (Table 6; Table 7); however, this difference is only significant in females where the confidence intervals do not overlap. No significant differences in $\text{Min } F_{ST}$ are present between the sexes (Table 6; Table 7). Overall the mean within group variance estimates are similar for both sexes, and with body dimensions having higher within group variance estimates than those obtained using cranial dimensions.

In addition to differentiating municipalities, there is also separation by county as demonstrated in graph of the PCA analysis of the R matrix (Figure 10; Figure 11; Figure 12). Overall, cranial and body dimensions do not present the same pattern of genetic variation (Figure 11; Figure 12). There is also a different pattern of genetic variation present in males and females (Figure 10; Figure 11; Figure 12). There appears to be differences between the sexes in the magnitude of differentiation between municipalities in the two counties with it being more pronounced in females than in

Table 6. *R* matrix analysis of Females level of municipality (gmina)

	<i>Min F_{ST}</i>	<i>Standard Error</i>	<i>Confidence Interval Min F_{ST}</i>	<i>Unbiased Min F_{ST}</i>	<i>Mean within group phenotypic variance</i>	<i>Non-zero eigenvalues</i>	<i>First Eigenvalue</i>	<i>Second Eigenvalue</i>
Female all	0.047551	0.001115	0.045321- 0.049781	0.035957	0.935	13	32.4%	14.6%
Female head	0.052328	0.001591	0.049146- 0.055510	0.040727	0.919	7	36.5%	20.4%
Female body	0.039257	0.001498	0.036261- 0.042253	0.027942	0.958	6	38.3%	23.1%

Table 7. *R* matrix analysis of Males level municipality (gmina)

	<i>Min F_{ST}</i>	<i>Standard Error</i>	<i>Confidence Interval Min F_{ST}</i>	<i>Unbiased Min F_{ST}</i>	<i>Mean within group phenotypic variance</i>	<i>Non-zero eigenvalues</i>	<i>First Eigenvalue</i>	<i>Second Eigenvalue</i>
Male all	0.046790	0.001027	0.044736- 0.048844	0.035683	0.930	14	34.3%	13.3%
Male head	0.048777	0.001471	0.045835- 0.051719	0.037755	0.915	7	46.9%	14.8%
Male body	0.044300	0.001425	0.041450- 0.04715	0.033262	0.946	7	32.9%	22.3%

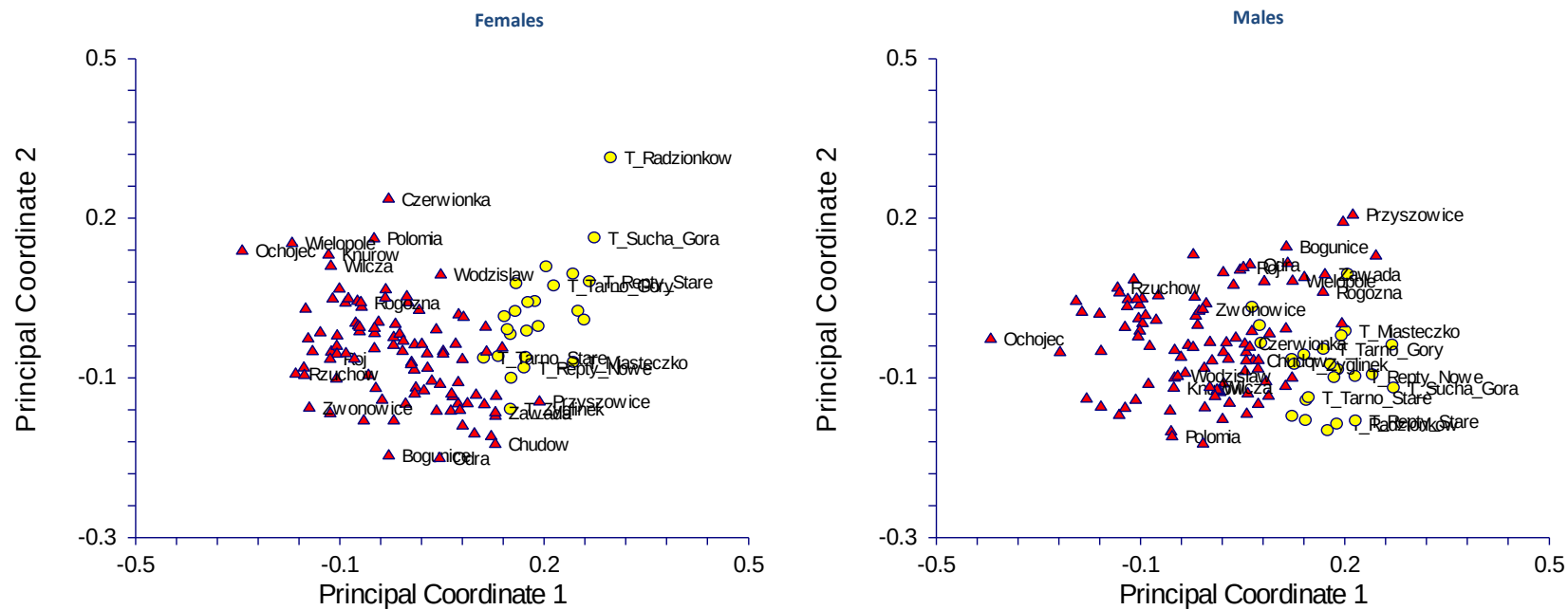


Figure 10. Principle Coordinate Analysis of *R* Matrix for Analysis at the Level of Municipality Using All Variables.

The same municipalities are labeled to facilitate observation in changing patterns. Municipalities in the Rybnik county are designated as red triangles, with those in the Tarnowski Gory county designated as yellow circles

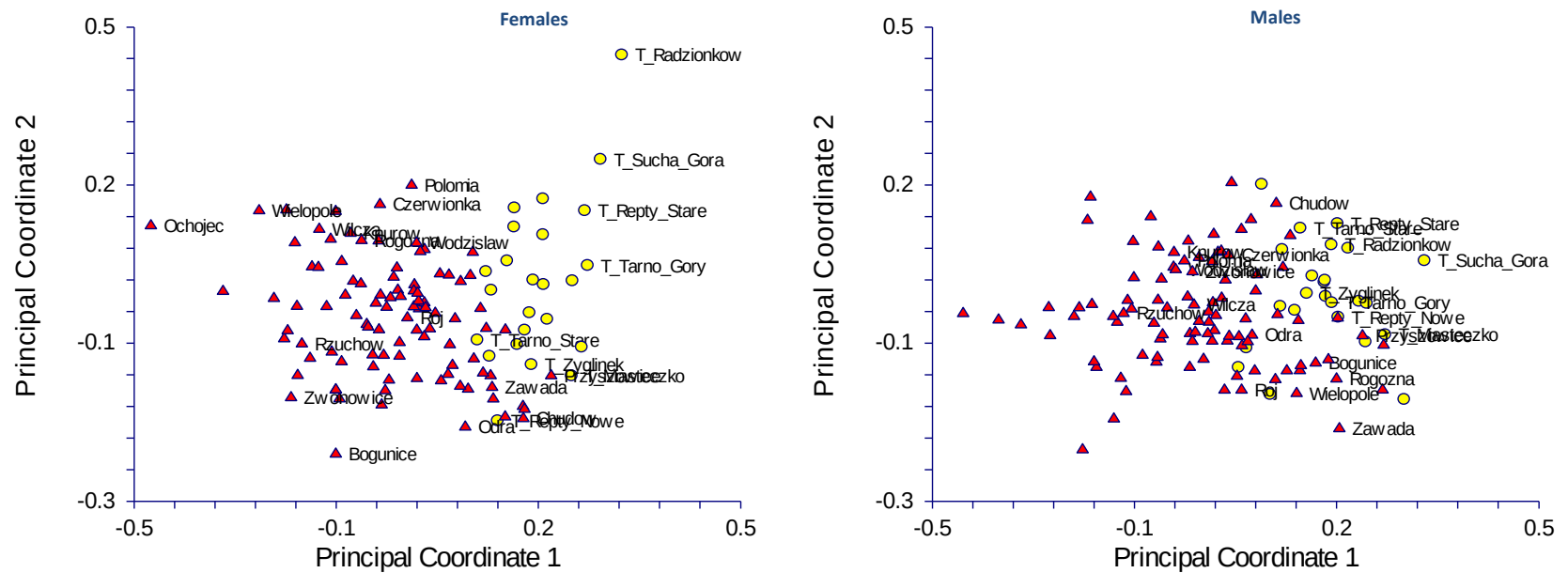


Figure 11. Principle Coordinate Analysis of *R* Matrix for Analysis at the Level of Municipality Using Cranial Dimensions.

The same municipalities are labeled to facilitate observation in changing patterns. Municipalities in the Rybnik county are designated as red triangles, with those in the Tarnowski Gory county designated as yellow circles

males (Figure 10; Figure 11; Figure 12). Substantial amounts of gene flow is seen in Przyszowice, Ochojec, Such Gora, Radzionkow as they are located far from the centroid with higher than expected variance (Figure 13; Figure 14; Figure 15). Genetic drift appears to have played a larger role in Rogozna, Zawada as well as Repty Stare and Nowe due to their location close to the centroid with lower than expected within group phenotypic variance (Figure 13; Figure 14; Figure 15).

County (Powiat)

Overall the analysis of population structure indicates that there is significant differentiation between the 5 counties in this analysis (Female Min F_{ST} = 0.020473; Male Min F_{ST} = 0.017120; Table 8 & Table 9). It appears that significant gene flow was occurring in all of these counties as the r (*iii*) values are very low, while the within-group phenotypic variances are very high (Table 10). The highest amount of gene flow is present in Gizycko, whereas the lowest is present in the county of Tucholski for females and Olsztyn for males (Table 10). Of the five counties Tucholski is the most geographically disparate (Figure 4), and despite relatively low between-group differentiation it is consistently separated from the other counties in the graph of the principle coordinate analysis of the R matrix (Figure 16; Figure 17). The remaining four counties tend to group together in pairs roughly corresponding to geographic proximity (Figure 4; Figure 16; Figure 17). There also appears to be a difference between the sexes in the magnitude of differentiation between the pair of Olsztyn and Szczycienski when using cranial dimensions (Figure 17) with the difference in females being more pronounced. Otherwise the pattern of differentiation is similar between the sexes and roughly follows geographic distance (Figure 4; Figure 16; Figure 17) No significant differences in Min F_{ST} estimates are present between cranial and body dimensions or between the sexes (Table 8; Table 9). Overall males have slightly higher mean within group variance estimates than females, and body dimensions in both sexes have higher within group variance estimates than those obtained using cranial dimensions (Table 8; Table 9).

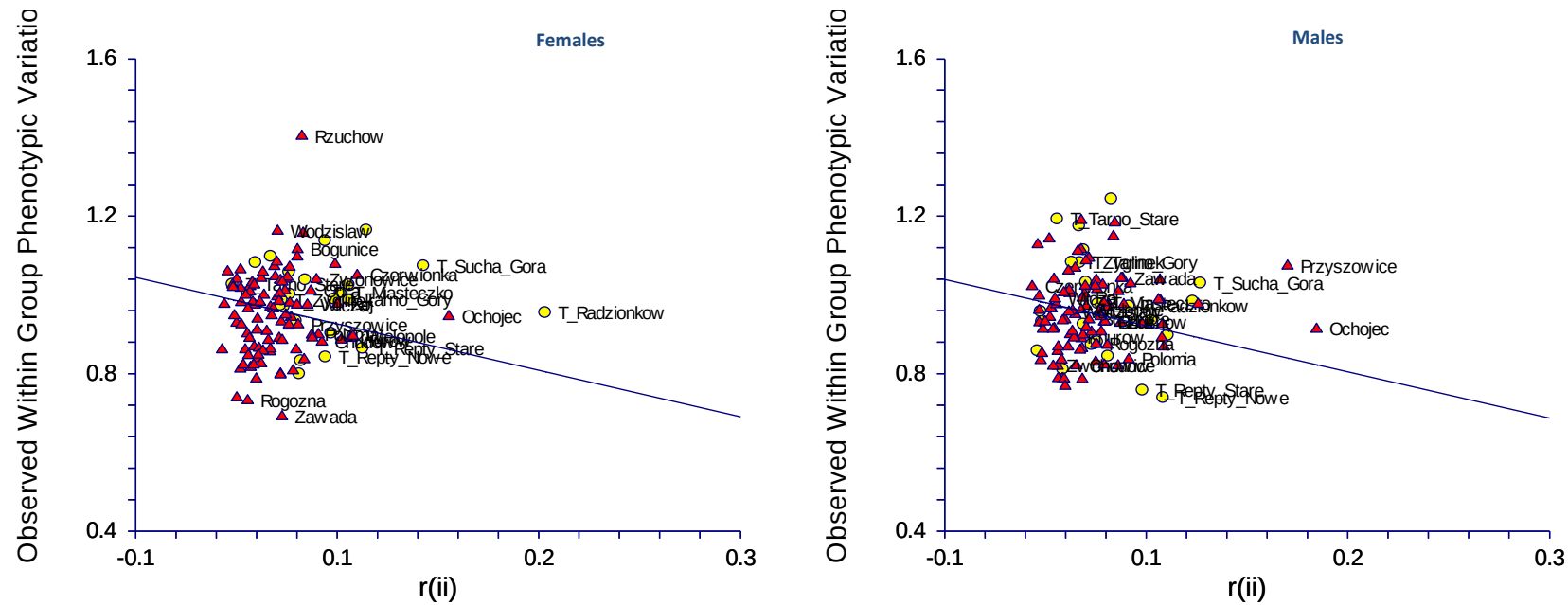


Figure 13. Distance from Centroid Versus Observed Within-Group Phenotypic Variation Using All Variables.

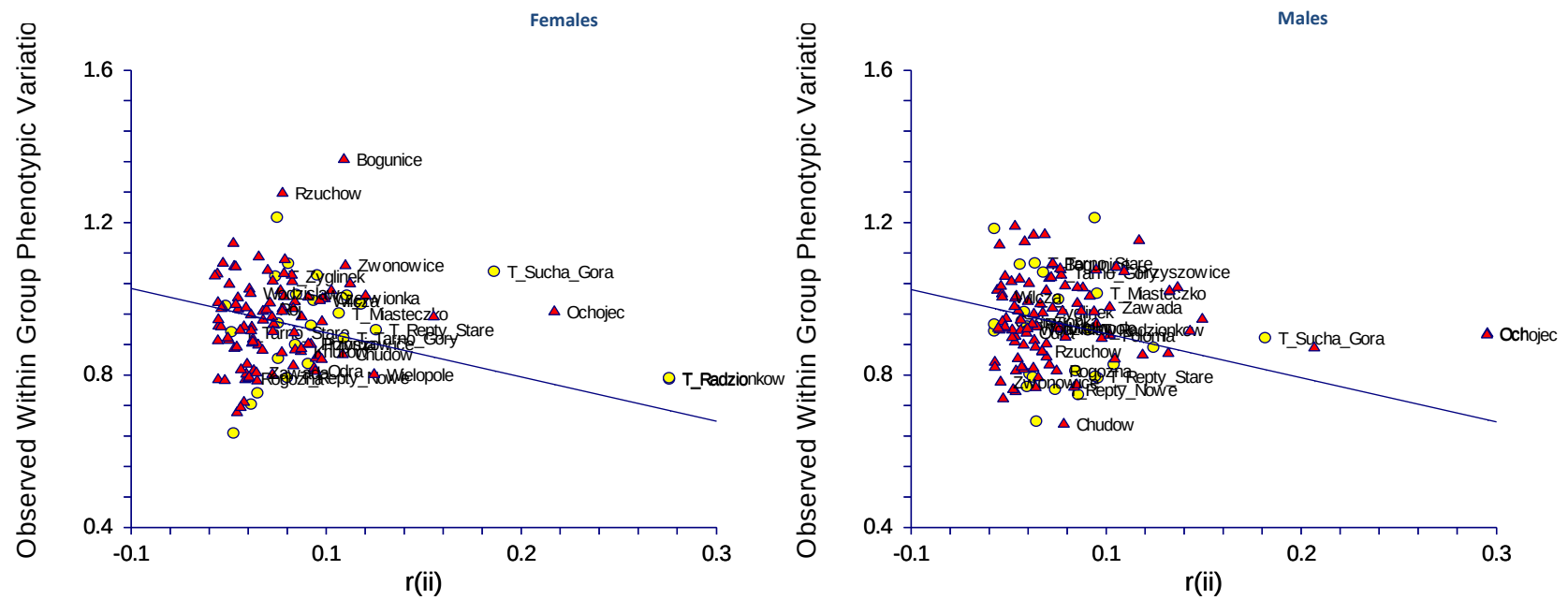


Figure 14. Distance from Centroid Versus Observed Within-Group Phenotypic Variation Using Cranial Dimensions.

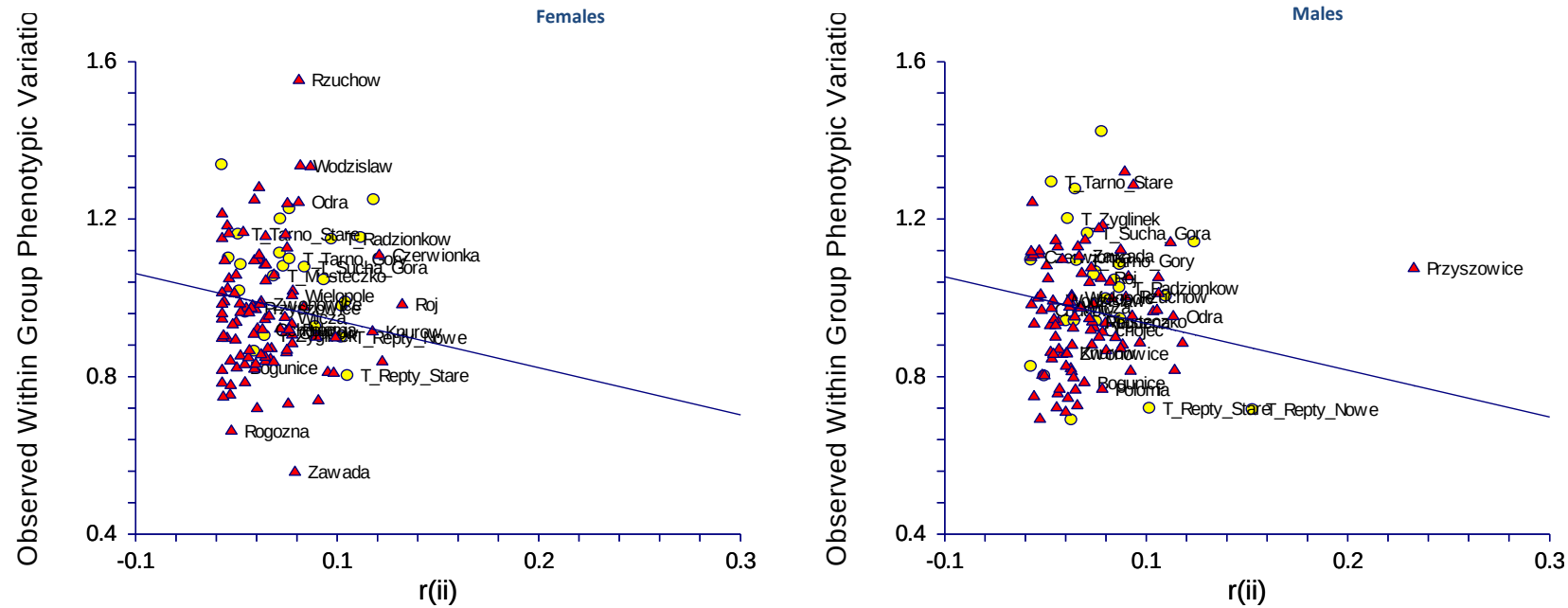


Figure 15. Distance from Centroid Versus Observed Within-Group Phenotypic Variation Using Body Dimensions.

Table 8. R matrix analysis of Females level of county (Powiat)

	<i>Min F_{ST}</i>	<i>Standard Error</i>	<i>Confidence Interval Min F_{ST}</i>	<i>Unbiased Min F_{ST}</i>	<i>Mean within group phenotypic variance</i>	<i>Non-zero eigenvalues</i>	<i>First Eigenvalue</i>	<i>Second Eigenvalue</i>
Female all	0.020473	0.003303	0.013867-0.027079	0.014866	0.988	4	68.1%	24.9%
Female head	0.019012	0.003515	0.011982-0.026042	0.013405	0.994	3	75.8%	17.1%
Female body	0.027607	0.009115	0.009377-0.045837	0.024312	0.946	1	100%	-

Table 9. R matrix analysis of Males level of county (Powiat)

	<i>Min F_{ST}</i>	<i>Standard Error</i>	<i>Confidence Interval Min F_{ST}</i>	<i>Unbiased Min F_{ST}</i>	<i>Mean within group phenotypic variance</i>	<i>Non-zero eigenvalues</i>	<i>First Eigenvalue</i>	<i>Second Eigenvalue</i>
Male all	0.017120	0.003605	0.00991-0.02433	0.008714	1.013	3	43.4%	42.9%
Male head	0.016275	0.003731	0.008813-0.023737	0.008112	1.017	2	53.8%	43.2%
Male body	0.021345	0.011605	-0.00187-0.044555	0.01436	0.986	1	100%	-

Table 10. Relethford-Blangero Analysis of 5 Counties (Powiat)

Variables	Population	FEMALES				MALES			
		r(ii)	Observed	Expected	Residual	r(ii)	Observed	Expected	Residual
All	Mragowo	0.013181	0.983	0.990	-0.007	0.011960	1.030	1.010	0.020
	Gizycko	0.026551	1.134	0.977	0.157	0.001080	1.232	1.021	0.210
	Olsztyn	0.009935	1.043	0.993	0.050	0.003113	0.805	1.019	-0.214
	Szczycienski	0.013455	0.900	0.990	-0.090	0.009489	1.066	1.013	0.053
	Tucholski	0.011208	0.881	0.992	-0.111	0.017927	0.935	1.004	-0.069
Cranial	Mragowo	0.006480	0.986	1.001	-0.016	0.014677	1.038	1.011	0.028
	Gizycko	0.030932	1.120	0.977	0.143	0	1.245	1.026	0.219
	Olsztyn	0.012102	1.048	0.996	0.052	0	0.818	1.026	-0.208
	Szczycienski	0.004656	0.916	1.003	-0.087	0.006649	1.048	1.019	0.030
	Tucholski	0.012858	0.903	0.995	-0.092	0.019235	0.937	1.006	-0.069
Body	Mragowo	0.058785	0.965	0.912	0.053	0	0.975	1.000	-0.025
	Gizycko	0	1.231	0.969	0.262	0.007233	1.138	0.993	0.145
	Olsztyn	0	1.015	0.969	0.045	0.031604	0.711	0.969	-0.258
	Szczycienski	0.062774	0.790	0.908	-0.118	0.017334	1.187	0.983	0.204
	Tucholski	0	0.727	0.969	-0.242	0.015630	0.918	0.985	-0.067

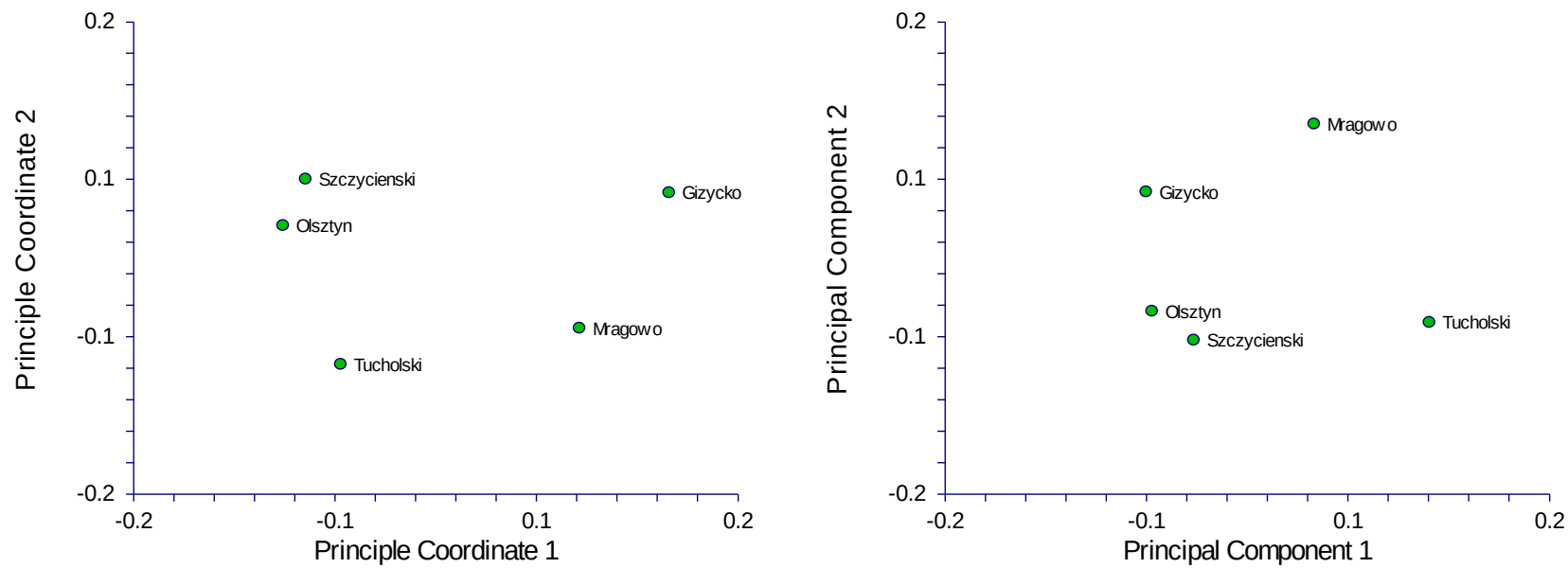


Figure 16. Principle Component Analysis of *R* Matrix for Analysis at the Level of County Using All Variables.

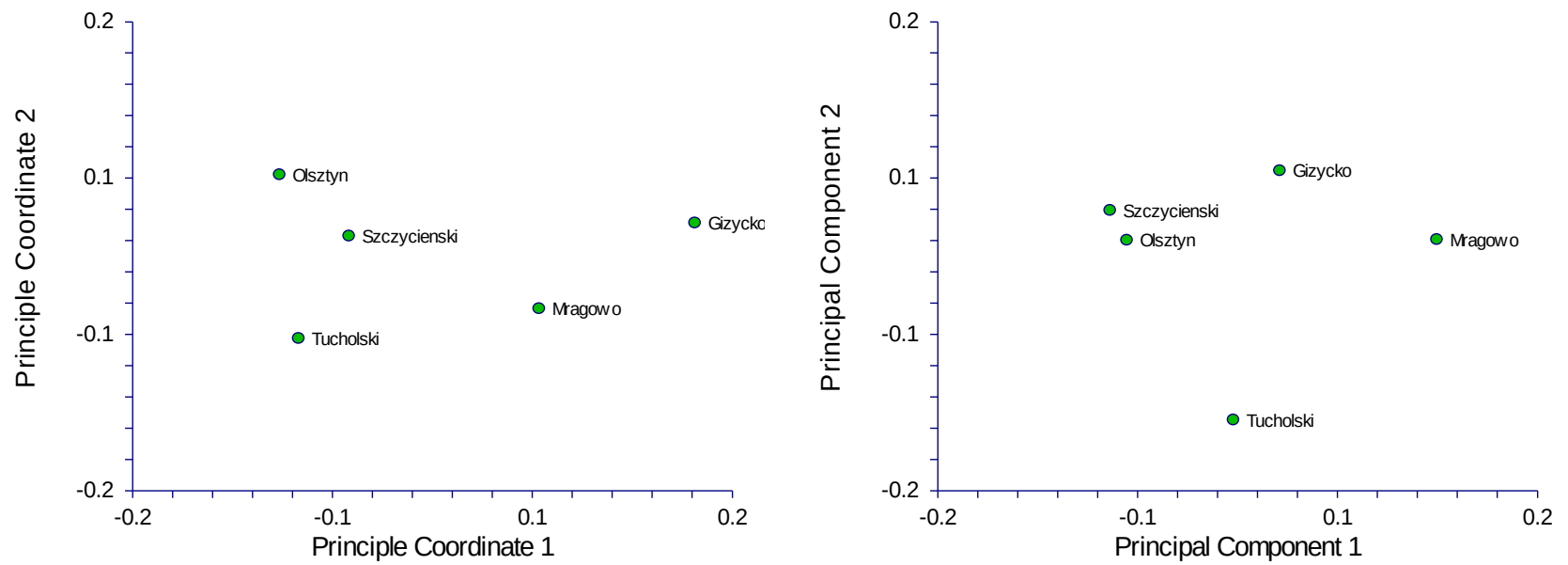


Figure 17. Principle Component Analysis of *R* Matrix for Analysis at the Level of County Using Cranial Dimensions.

Secular Trends

The analysis of secular change in these data is complicated by the fact that although a long time period is represented, year of birth 1851-1937, individual observations are not equally dispersed throughout this time period. This means that even with very large sample sizes some birth cohorts may only be represented by a few individuals. One approach to this issue is to create random samples to achieve equal sample sizes. Unfortunately, this method is not effective in all cases as it can drastically reduce sample sizes or the time depth of the analysis. An alternative method to this is provided for in regression analysis where weights can be added to an observation. As one observation in these analyses represents the average of a time period the regression analysis can be weighted by the sample size for each average. Seven variables were assessed for secular trend using NCSS 2007 (Hintze, 2009). The results of these analyses follow and are presented in two sections for body and cranial dimensions.

Secular Change in Body Dimensions

Height (HGT)

There is a significant increasing trend in height over the time period investigated and the means, standard deviations and sample sizes are presented in Table 11 and Table 12. Through ARIMA modeling it was determined that there is a significant first order autoregressive component to both male and female series ($p < 0.000001$). Holt's double exponential smoothing method tracked the trend in the series well (Females $Pseudo R^2 = 0.763399$; Males $Pseudo R^2 = 0.697853$); outperforming the random sample regression model in the female sample, but performed poorly in comparison to the regression models for the male sample. The robust weighted regression analysis also tracked the trend well (Females $R^2 = 0.7698$; Males $R^2 = 0.8626$; both at $p < 0.000001$); however, there were problems with the residuals not being normally distributed. Although the analysis using the random sample with equal sample sizes for each time period is outperformed by the weighted averages model it does not have the same problems with non-normality of residuals and is the preferred model in this analysis (Females $R^2 = 0.7288$; Males $R^2 = 0.7480$; both at $p < 0.000001$). Models for the male sample perform consistently better than that for the female sample. There is an unusually high average height in the first female cohort but the models that use cohorts 1 through 3 in their analysis actually perform better on the basis of R^2 than the random sample regression analysis which does not. In all cases a significant positive trend in height was observed but it is much steeper in males (Figure 18).

Table 11. Summary Data in the Analysis of Secular Change in Female Height

Cohort	YOB Range	Raw Data					Random Sample for equal n				
		N	Mean HGT	SD_{HGT}	Mean AGE	SD_{AGE}	N	Mean HGT	SD_{HGT}	Mean AGE	SD_{AGE}
1	<1860	5	1590.80	45.20	52.00	3.46	-				
2	1861-1865	9	1515.78	61.00	57.67	16.05	-				
3	1866-1870	27	1536.78	60.78	48.04	14.83	-				
4	1871-1875	46	1539.87	66.50	48.89	17.78	46	1539.87	66.50	48.89	17.78
5	1876-1880	55	1548.55	71.89	43.69	17.80	46	1548.52	74.94	44.28	17.56
6	1881-1885	61	1543.69	53.47	47.84	18.61	46	1536.37	52.69	49.67	18.38
7	1886-1890	52	1546.79	66.30	49.46	16.71	46	1547.93	67.92	49.96	16.51
8	1891-1895	99	1539.48	59.25	50.87	8.03	46	1544.98	65.23	50.98	7.33
9	1896-1900	207	1549.08	65.05	45.72	4.90	46	1549.85	60.00	45.65	5.16
10	1901-1905	251	1554.87	62.63	40.85	4.63	46	1555.04	65.10	41.41	4.61
11	1906-1910	315	1553.24	60.91	35.43	4.03	46	1544.54	61.74	34.89	3.36
12	1911-1915	284	1559.01	59.05	31.83	5.19	46	1567.63	56.31	32.57	5.64
13	1916-1920	244	1569.00	58.28	25.90	5.16	46	1560.39	48.72	26.46	5.05
14	1921-1925	216	1568.52	58.54	23.40	5.28	46	1560.04	55.53	22.35	4.87
15	1926-1930	109	1587.88	64.92	25.87	1.53	46	1576.48	61.88	26.04	1.50
16	1931-1935	211	1598.44	55.50	21.07	1.42	46	1600.00	51.72	21.15	1.58
17	>1935	53	1605.55	50.21	18.00	0	46	1605.57	52.11	18.00	0

Table 12. Summary Data in the Analysis of Secular Change in Male Height

Cohort	YOB Range	<i>Raw Data</i>					<i>Random Sample for equal n</i>				
		N	Mean HGT	SD_{HGT}	Mean AGE	SD_{AGE}	N	Mean HGT	SD_{HGT}	Mean AGE	SD_{AGE}
1	<1860	8	1646.88	80.53	53.25	3.15	-				
2	1861-1865	18	1650.67	36.93	48.50	7.20	-				
3	1866-1870	25	1648.36	81.15	50.40	16.59	-				
4	1871-1875	39	1641.05	72.64	48.59	17.51	34	1642.68	76.52	47.91	16.71
5	1876-1880	47	1654.98	51.36	54.26	18.88	34	1659.59	46.00	49.74	19.22
6	1881-1885	34	1660.74	63.62	54.85	14.99	34	1660.74	63.62	54.85	14.99
7	1886-1890	71	1661.00	85.57	51.76	13.74	34	1669.47	91.02	52.50	13.81
8	1891-1895	111	1650.13	57.11	49.38	6.97	34	1639.94	62.14	48.53	6.37
9	1896-1900	205	1662.21	61.29	44.84	3.89	34	1640.29	70.22	45.09	4.20
10	1901-1905	294	1669.29	64.71	40.65	4.58	34	1657.53	58.42	39.76	3.31
11	1906-1910	308	1667.70	69.89	35.39	4.28	34	1672.59	61.74	36.03	5.11
12	1911-1915	268	1678.41	62.16	30.67	4.37	34	1683.68	53.72	30.18	3.66
13	1916-1920	293	1693.76	62.51	24.01	3.73	34	1698.71	55.13	24.09	3.41
14	1921-1925	243	1690.60	66.58	21.04	4.39	34	1688.79	69.99	21.26	4.59
15	1926-1930	105	1694.90	54.91	25.46	1.34	34	1687.79	61.93	25.76	1.35
16	1931-1935	89	1695.67	60.11	20.96	1.35	34	1704.56	58.97	20.76	1.39
17	>1935	40	1718.45	67.29	18.03	0.16	34	1715.15	68.79	18.03	0.17

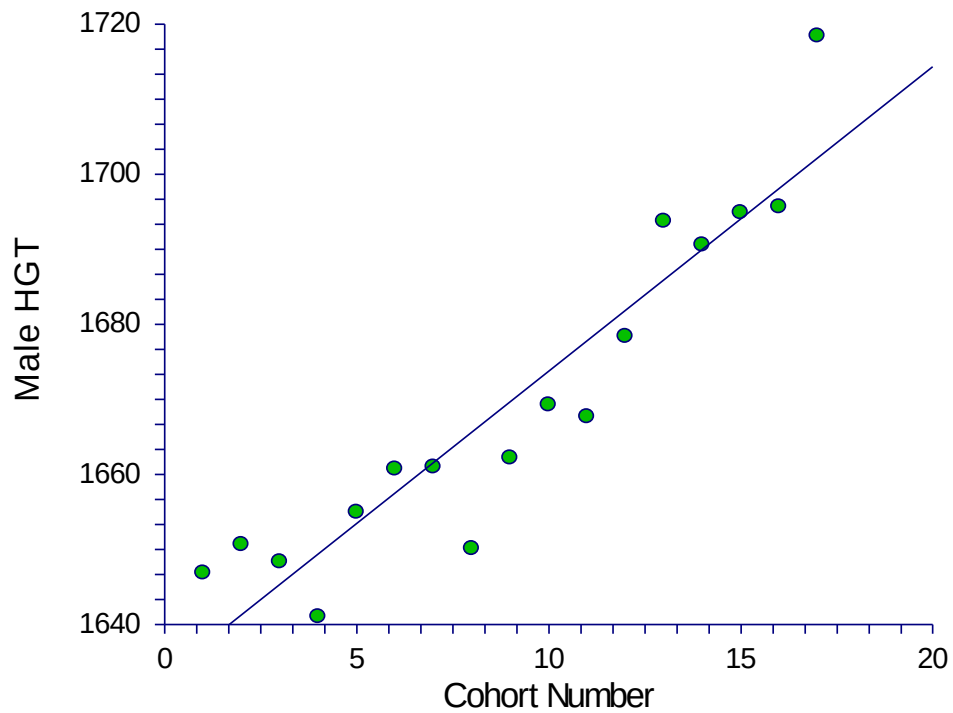
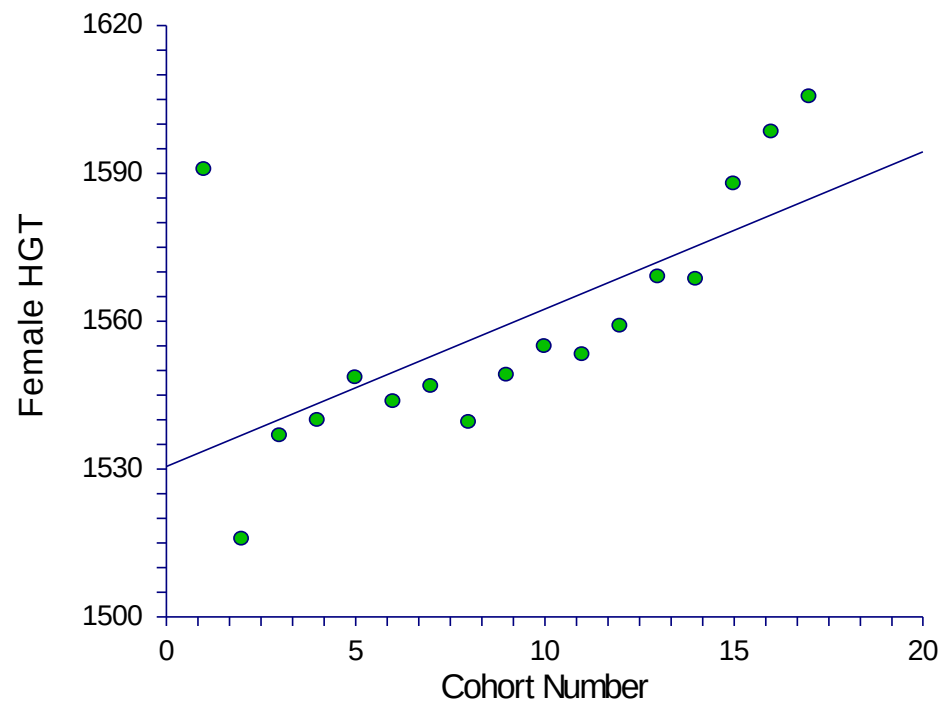


Figure 18. Scatterplot of average height for males and females born between 1860-1935. Each cohort represents 5 years and the regression lines are significant ($p=0.00001$).

Shoulder Breadth (SHB)

There is a slight increasing trend in shoulder breadth over the time period investigated and the means, standard deviations and sample sizes are presented in Table 13 and Table 14. Through ARIMA modeling it was determined that there is a significant first order autoregressive and moving average components to the raw female data, while only a significant first order moving average component was found in the random sample series ($p < 0.00001$). The male sample is more complex with significant first order moving average and differencing components to both data series ($p < 0.00001$). Holt's double exponential smoothing method only tracked the trend moderately well in the female raw data series and was completely insignificant for both male data series (Females *Pseudo* $R^2 = 0.36$; Males *Pseudo* $R^2 < 0.001$). Both robust regression models were insignificant for the male sample (Males_{RAW} $R^2 = 0.0520$; Males_{EQN} $R^2 = 0.0679$; both at $p = 0.4536$). The robust weighted regression was significant in the female sample ($R^2 = 0.6602$, $p = 0.0007$); however, there were problems with the residuals not being normally distributed. The robust regression using the female random sample data was insignificant ($R^2 = 0.3339$, $p = 0.1742$). Overall, a slight but insignificant increasing trend in shoulder breadth was observed, with it being more pronounced in females than in males (Figure 19).

Lower Limb Length (LLL)

There is a significant increasing trend in the length of the lower limb over the study period (Figure 20). Holt's double exponential smoothing method only tracked the trend moderately well in the female raw data series and was completely insignificant for both male data series (Females *Pseudo* $R^2 = 0.389$; Males *Pseudo* $R^2 < 0.001$). The robust weighted regression was significant in the female sample ($R^2 = 0.9033$, $p < 0.0001$); however, there were problems with the residuals not being normally distributed. The robust regression using the female random sample data was also significant but performs worse considering R^2 estimates ($R^2 = 0.6731$, $p = 0.0238$). However in this model the residuals are normally distributed and it meets all assumptions making this the model of choice for the female sample. For the male sample both robust regression models fail to meet model assumptions ($R^2_{WEIGHTED} = 0.5237$, $p = 0.0078$; $R^2_{EQUAL N} = 0.6868$, $p = 0.0212$). The means, standard deviations and sample sizes are presented in Table 15 and Table 16.

Table 13. Summary Data in the Analysis of Secular Change in Female Shoulder Breadth

Cohort	YOB Range	<i>Raw Data</i>					<i>Random Sample for equal n</i>				
		N	Mean SHB	SD_{SHB}	Mean AGE	SD_{AGE}	N	Mean SHB	SD_{SHB}	Mean AGE	SD_{AGE}
1	<1860	-					-				
2	1861-1865	3	341.67	16.01	79.00	1.00	-				
3	1866-1870	3	337.67	3.06	72.33	2.52	-				
4	1871-1875	9	362.67	15.58	68.67	1.41	-				
5	1876-1880	11	344.27	20.75	64.64	1.50	-				
6	1881-1885	19	349.37	14.17	58.63	1.42	-				
7	1886-1890	25	350.36	13.73	54.40	1.41	-				
8	1891-1895	69	353.49	15.25	48.68	1.47	69	353.49	15.25	48.68	1.47
9	1896-1900	170	356.42	34.88	43.57	1.47	69	358.25	33.51	43.68	1.57
10	1901-1905	208	355.42	26.49	38.88	1.40	69	354.19	21.00	39.14	1.42
11	1906-1910	279	356.85	24.38	34.09	1.49	69	354.81	16.53	34.09	1.61
12	1911-1915	221	356.69	26.57	29.20	1.40	69	353.68	21.69	29.49	1.29
13	1916-1920	196	360.29	37.48	23.51	1.51	69	365.78	55.25	23.65	1.60
14	1921-1925	147	358.21	28.70	19.92	1.04	69	356.68	14.40	19.91	1.09
15	1926-1930	-					-				
16	1931-1935	-					-				
17	>1935	-					-				

Table 14. Summary Data in the Analysis of Secular Change in Male Shoulder Breadth

Cohort	YOB Range	Raw Data					Random Sample for equal n				
		N	Mean SHB	SD_{SHB}	Mean AGE	SD_{AGE}	N	Mean SHB	SD_{SHB}	Mean AGE	SD_{AGE}
1	<1860	-					-				
2	1861-1865	2	376.00	5.66	77.50	0.71	-				
3	1866-1870	3	370.33	3.06	72.00	1.00	-				
4	1871-1875	9	382.00	19.77	68.89	1.54	-				
5	1876-1880	16	374.56	18.65	63.69	1.74	-				
6	1881-1885	18	376.33	16.00	57.94	1.86	-				
7	1886-1890	41	375.59	23.21	53.68	1.44	41	375.59	23.21	53.68	1.44
8	1891-1895	92	378.77	20.66	48.48	1.57	41	381.00	22.79	48.39	1.34
9	1896-1900	185	380.00	29.56	43.66	1.49	41	381.95	18.89	43.73	1.53
10	1901-1905	248	385.97	29.27	38.80	1.52	41	384.22	26.64	39.07	1.37
11	1906-1910	268	383.23	27.39	33.88	1.57	41	380.37	23.89	33.85	1.81
12	1911-1915	231	387.07	23.11	29.08	1.50	41	391.29	37.09	29.07	1.60
13	1916-1920	266	379.07	20.57	22.99	1.49	41	383.39	18.67	22.98	1.33
14	1921-1925	208	371.41	23.22	19.30	1.14	41	368.49	21.38	19.49	1.10
15	1926-1930	-					-				
16	1931-1935	-					-				
17	>1935	-					-				

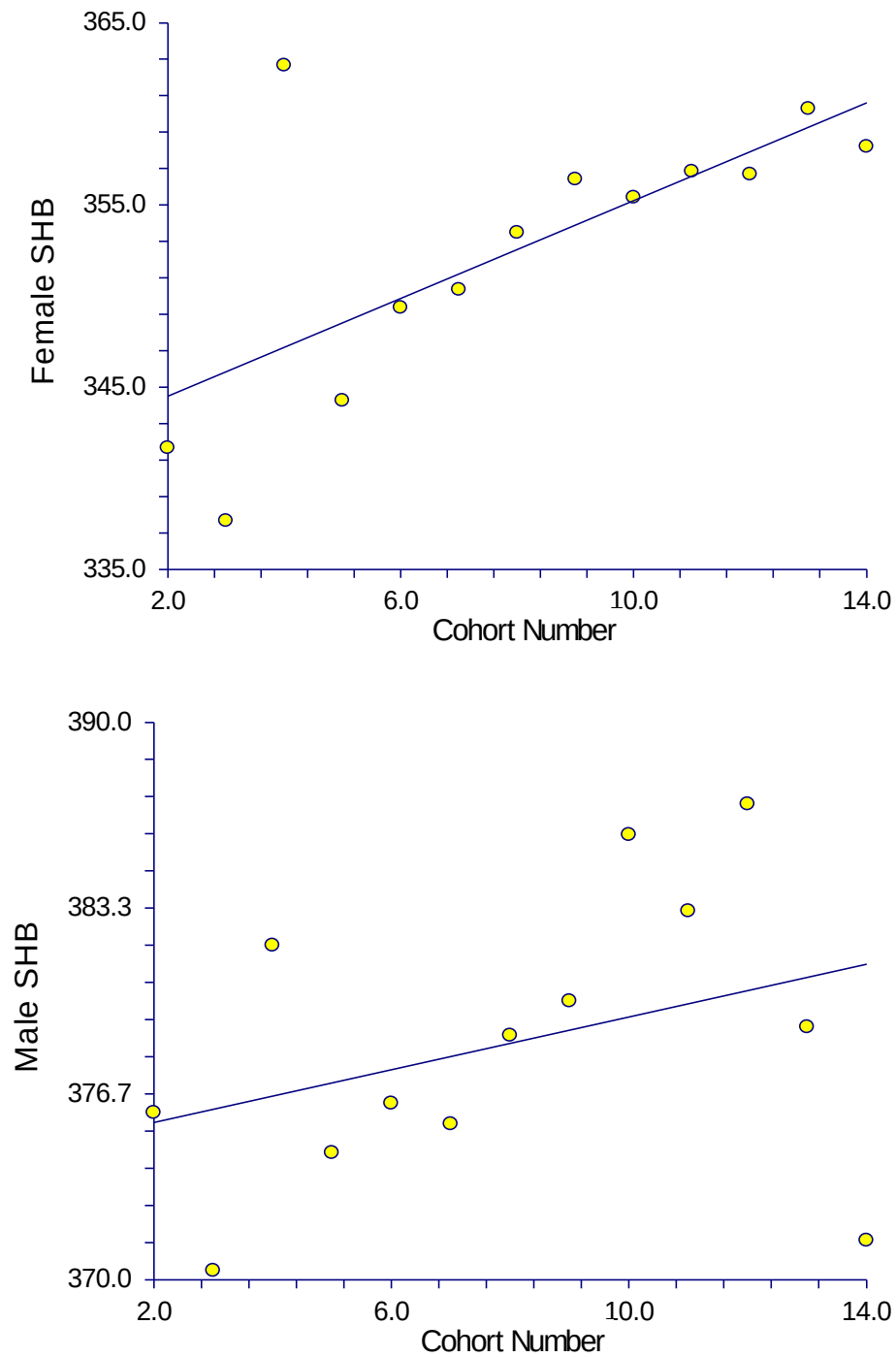


Figure 19. Scatterplot of average shoulder breadth for males and females born between 1860-1935. Each cohort represents 5 years and the regression lines are not significant.

Table 15. Summary Data in the Analysis of Secular Change in the Length of the Lower Limb (LLL) in Females.

Cohort	YOB Range	Raw Data					Random Sample for equal n				
		N	Mean LLL	SD_{LLL}	Mean AGE	SD_{AGE}	N	Mean LLL	SD_{LLL}	Mean AGE	SD_{AGE}
1	<1860	-	-	-	-	-	-	-	-	-	-
2	1861-1865	3	724.00	65.09	79.00	1.00	-	-	-	-	-
3	1866-1870	-	-	-	-	-	-	-	-	-	-
4	1871-1875	1	706.00	0	70.00	0	-	-	-	-	-
5	1876-1880	2	755.50	54.45	64.00	2.83	-	-	-	-	-
6	1881-1885	8	725.00	40.25	58.75	1.39	-	-	-	-	-
7	1886-1890	15	735.40	25.19	54.33	1.23	-	-	-	-	-
8	1891-1895	48	735.10	43.56	48.63	1.35	48	735.10	43.56	48.63	1.35
9	1896-1900	113	737.92	35.24	43.88	1.50	48	738.90	37.54	43.92	1.54
10	1901-1905	131	744.34	36.00	38.94	1.39	48	753.38	39.27	39.04	1.46
11	1906-1910	183	745.90	37.17	34.21	1.42	48	741.92	37.03	34.19	1.50
12	1911-1915	157	748.47	33.86	29.28	1.45	48	743.21	33.60	29.06	1.56
13	1916-1920	154	759.10	36.84	23.60	1.45	48	755.56	38.45	23.48	1.49
14	1921-1925	120	756.43	36.48	19.99	1.00	48	762.54	39.80	20.13	0.96
15	1926-1930	-	-	-	-	-	-	-	-	-	-
16	1931-1935	-	-	-	-	-	-	-	-	-	-
17	>1935	-	-	-	-	-	-	-	-	-	-

Table 16. Summary Data in the Analysis of Secular Change in the Length of the Lower Limb (LLL) in Males.

Cohort	YOB Range	Raw Data					Random Sample for equal n				
		N	Mean LLL	SD_{LLL}	Mean AGE	SD_{AGE}	N	Mean LLL	SD_{LLL}	Mean AGE	SD_{AGE}
1	<1860	-	-	-	-	-	-	-	-	-	-
2	1861-1865	1	835.00	0	77.00	0	-	-	-	-	-
3	1866-1870	-	-	-	-	-	-	-	-	-	-
4	1871-1875	3	782.00	21.70	67.33	0.58	-	-	-	-	-
5	1876-1880	3	799.67	9.87	63.67	1.53	-	-	-	-	-
6	1881-1885	5	826.60	14.84	58.60	1.82	-	-	-	-	-
7	1886-1890	17	815.76	39.59	54.12	1.50	-	-	-	-	-
8	1891-1895	58	816.03	37.46	48.76	1.56	58	816.03	37.46	48.76	1.56
9	1896-1900	116	823.86	37.42	43.95	1.35	58	824.62	39.09	43.93	1.39
10	1901-1905	157	820.50	37.55	39.06	1.40	58	818.66	41.19	39.07	1.40
11	1906-1910	188	826.13	38.59	34.07	1.47	58	827.02	36.91	34.21	1.54
12	1911-1915	176	825.13	37.91	29.08	1.46	58	822.55	39.78	28.84	1.50
13	1916-1920	149	829.70	34.94	23.54	1.32	58	830.64	32.09	23.88	1.26
14	1921-1925	90	824.83	34.92	19.90	1.14	58	825.79	33.92	19.88	1.19
15	1926-1930	-	-	-	-	-	-	-	-	-	-
16	1931-1935	-	-	-	-	-	-	-	-	-	-
17	>1935	-	-	-	-	-	-	-	-	-	-

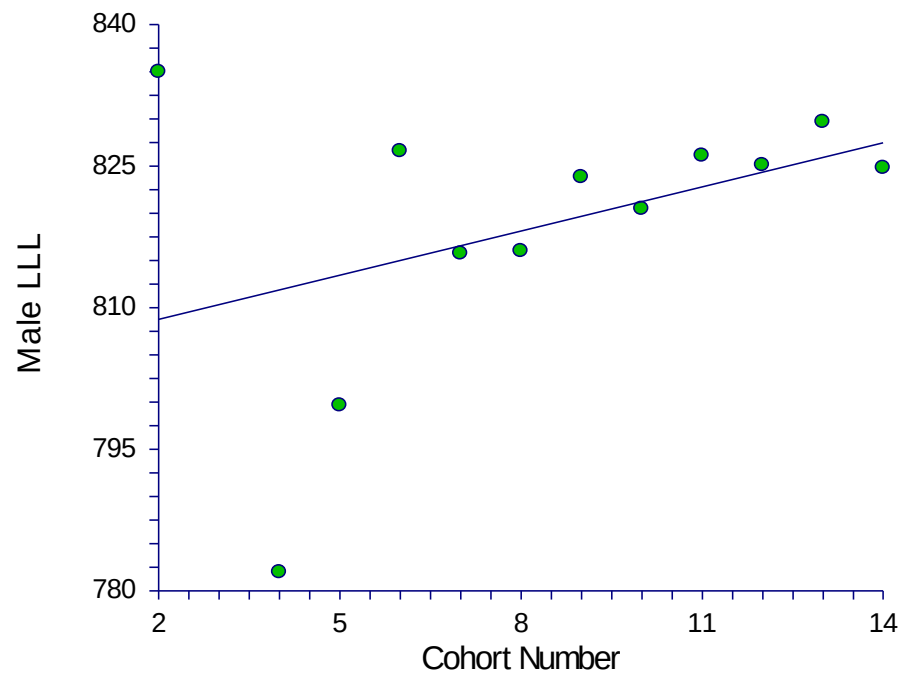
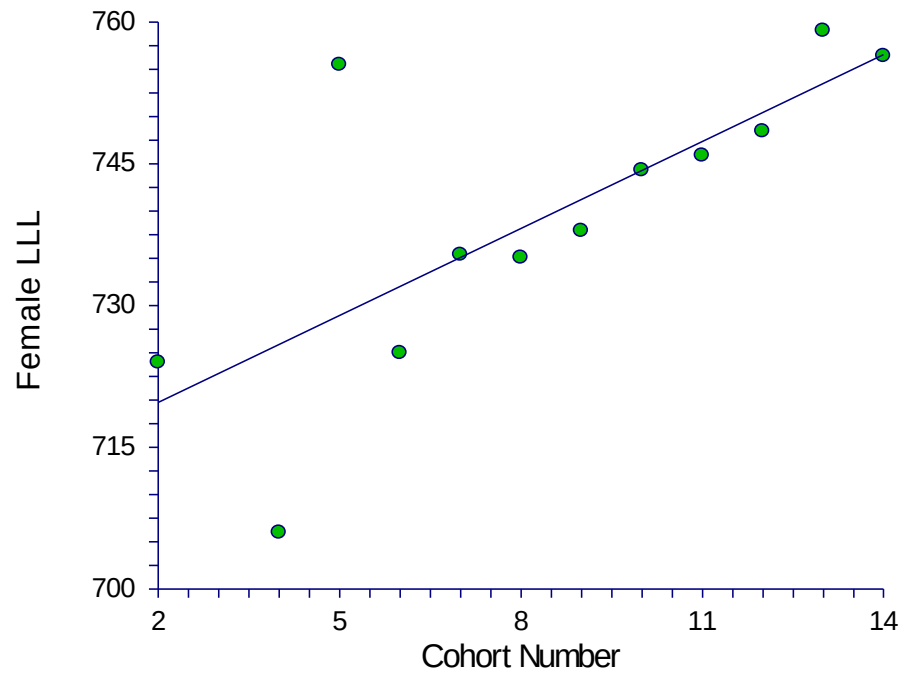


Figure 20. Scatterplot of average lower limb length for males and females born between 1860-1935. Each cohort represents 5 years and the regression lines are significant.

Secular Change in Cranial Dimensions

Cephalic Index (CEI)

A quadratic function captures the transition in males ($R^2 = 0.803$) and females ($R^2 = 0.881$) from increasing to decreasing cephalic indices (Figure 21). For obvious reasons no other model performed well for this sample. The means, standard deviations and sample sizes are presented in Table 17 and Table 18.

Maximum Cranial Length (MCL)

A quadratic function captures the transition in males ($R^2 = 0.618344$) and females ($R^2 = 0.828087$) of decreasing to increasing cranial length measurements (Figure 22). Interestingly, Holt's Double Exponential Smoothing models the data very well for the female sample (*Pseudo* $R^2 = 0.644$) and decently for the male sample (*Pseudo* $R^2 = 0.2964$); however, neither model is significant ($p > 0.05$) although this test of significance can only determine the significance of linear and one directional trends. The trend in maximum cranial length mirrors that of cephalic index, indicating that changes in length contributed to the change observed in cephalic index (Figure 21; Figure 22). The means, standard deviations and sample sizes are presented in Table 19 and Table 20.

Maximum Cranial Breadth (MCB)

A quadratic function captures the transition in males ($R^2 = 0.8082$) and females ($R^2 = 0.7759$) of increasing to decreasing cranial breadth measurements (Figure 23). The trend in maximum cranial breadth mirrors that of cephalic index, indicating that changes in breadth as well as length are responsible for the change in cephalic index (Figure 21; Figure 22; Figure 23). The means, standard deviations and sample sizes are presented in Table 21 and Table 22.

Zygomatic Breadth (MCB)

There is a decreasing trend in zygomatic breadth in both males and females indicating that the face in addition to the vault is getting narrower in both sexes (Figure 24). This trend is significant in the male sample ($R^2 = 0.7923$, $p = 0.0000$), but not in the female sample ($R^2 = 0.0765$, $p = 0.2826$). Both regression models and Holt's Double Exponential Smoothing Method failed to model a significant trend in the female sample. The means, standard deviations and sample sizes are presented in Table 23 and Table 24.

Table 17. Summary Data in the Analysis of Secular Change in the Cephalic Index (CEI) in Females

Cohort	YOB Range	<i>Raw Data</i>					<i>Random Sample for equal n</i>				
		N	Mean CEI	SD_{CEI}	Mean AGE	SD_{AGE}	N	Mean CEI	SD_{CEI}	Mean AGE	SD_{AGE}
1	<1860	-					-				
2	1861-1865	-					-				
3	1866-1870	-					-				
4	1871-1875	61	82.12	3.18	56.87	20.88	50	83.93	3.75	50.44	16.81
5	1876-1880	76	83.12	3.36	52.62	20.98	50	85.32	3.27	52.24	6.24
6	1881-1885	81	83.34	3.12	53.32	18.85	50	84.03	3.88	46.74	5.51
7	1886-1890	55	83.98	3.67	50.31	16.62	50	85.31	3.69	40.08	4.13
8	1891-1895	111	84.46	3.51	51.92	8.17	50	85.56	3.53	35.98	4.92
9	1896-1900	210	84.52	3.73	46.21	5.27	50	84.98	3.23	32.88	5.51
10	1901-1905	259	85.06	3.73	41.25	4.96	50	84.50	3.47	26.46	6.01
11	1906-1910	322	85.32	3.94	35.81	4.46	50	84.13	3.03	24.32	5.42
12	1911-1915	290	85.06	3.93	32.23	5.45	50	82.86	3.73	25.62	1.50
13	1916-1920	248	84.66	3.73	26.21	5.37	50	84.40	3.22	21.10	1.43
14	1921-1925	223	84.57	3.38	23.70	5.4	50	82.87	3.30	18.00	0
15	1926-1930	126	83.01	3.27	25.79	1.51	50	83.93	3.75	50.44	16.81
16	1931-1935	242	83.61	3.19	21.11	1.43	50	85.32	3.27	52.24	6.24
17	>1935	61	83.09	3.24	18.00	0	50	84.03	3.88	46.74	5.51

Table 18. Summary Data in the Analysis of Secular Change in the Cephalic Index (CEI) in Males.

Cohort	YOB Range	Raw Data					Random Sample for equal n				
		N	Mean CEI	SD_{CEI}	Mean AGE	SD_{AGE}	N	Mean CEI	SD_{CEI}	Mean AGE	SD_{AGE}
1	<1860	8	79.06	3.01	53.25	3.15	-				
2	1861-1865	23	82.70	3.22	56.52	16.99	-				
3	1866-1870	32	81.65	4.51	57.75	20.42	30	81.80	4.54	55.93	19.78
4	1871-1875	55	82.15	3.26	57.80	20.70	30	82.29	2.67	56.27	20.39
5	1876-1880	52	82.80	3.71	56.31	19.03	30	83.21	3.88	55.60	20.07
6	1881-1885	35	82.79	3.23	56.03	15.48	30	83.01	3.37	53.93	15.67
7	1886-1890	76	83.06	4.07	52.72	13.77	30	82.26	4.00	52.60	13.38
8	1891-1895	116	83.93	3.78	49.89	7.23	30	84.04	3.84	49.67	7.98
9	1896-1900	202	84.20	3.40	45.21	4.28	30	84.70	3.13	46.47	5.01
10	1901-1905	301	83.89	4.27	40.86	4.73	30	83.76	3.28	41.23	5.11
11	1906-1910	313	84.23	4.03	35.63	4.51	30	84.45	3.14	35.97	4.82
12	1911-1915	269	84.23	3.41	30.75	4.46	30	84.08	3.29	30.50	4.63
13	1916-1920	288	83.61	3.93	24.02	3.76	30	84.48	3.40	23.50	2.64
14	1921-1925	243	84.12	3.71	21.19	4.53	30	84.02	3.45	21.23	4.24
15	1926-1930	122	83.08	3.14	25.38	1.31	30	83.55	3.15	25.37	1.27
16	1931-1935	120	82.74	3.36	21.09	1.41	30	82.57	3.71	21.10	1.45
17	>1935	45	82.06	3.55	18.02	0.15	30	82.56	3.19	18.03	0.18

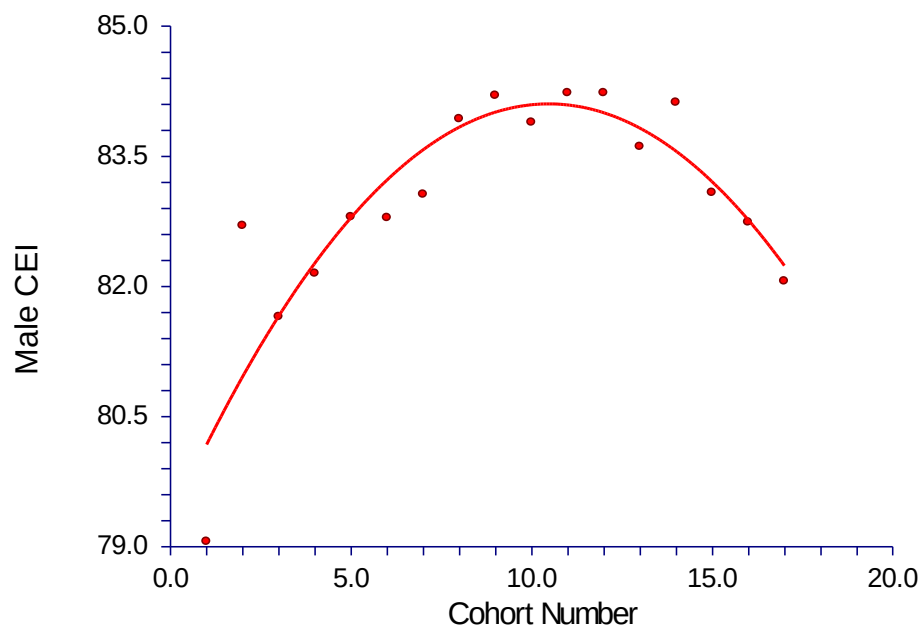
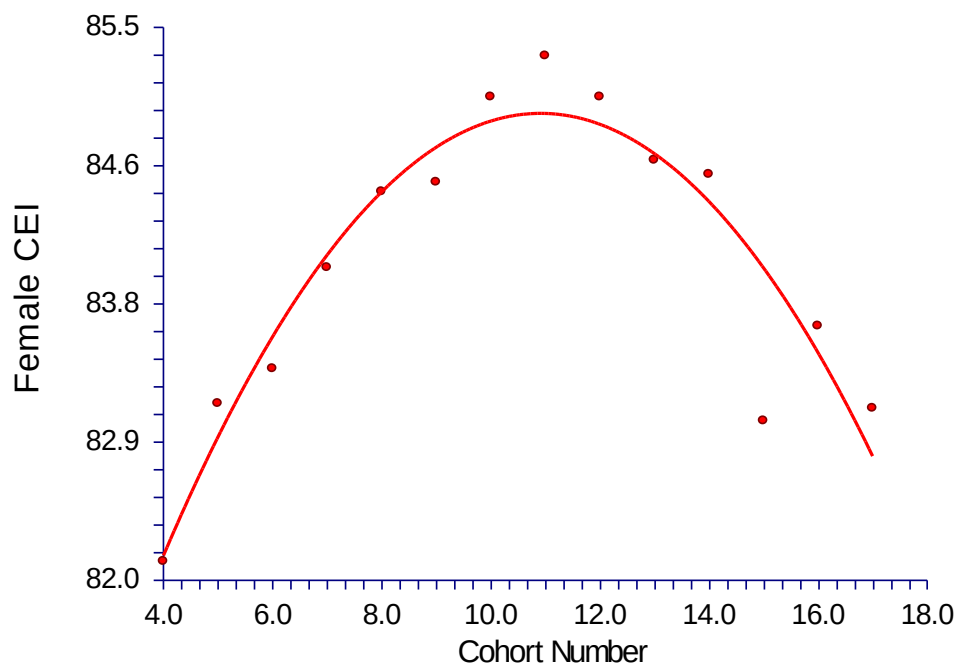


Figure 21. Scatterplot of average cephalic index for males and females born between 1860-1935. Each cohort represents 5 years. The quadratic regression lines are significant.

Table 19. Summary Data in the Analysis of Secular Change in the Maximum Cranial Length (MCL) in Females.

Cohort	YOB Range	<i>Raw Data</i>					<i>Random Sample for equal n</i>				
		N	Mean MCL	SD_{MCL}	Mean AGE	SD_{AGE}	N	Mean MCL	SD_{MCL}	Mean AGE	SD_{AGE}
1	<1860	5	183.80	9.39	52.00	3.46	-				
2	1861-1865	13	182.15	6.18	67.15	19.99	-				
3	1866-1870	33	183.00	6.08	54.33	19.16	-				
4	1871-1875	61	182.44	5.40	56.87	20.88	55	182.11	5.17	57.75	20.97
5	1876-1880	76	180.72	6.62	52.62	20.98	55	180.49	6.60	51.64	20.70
6	1881-1885	81	180.38	5.99	53.32	18.85	55	179.73	6.04	53.22	19.27
7	1886-1890	55	180.56	6.01	50.31	16.62	55	180.56	6.01	50.31	16.62
8	1891-1895	111	180.14	6.26	51.92	8.17	55	179.05	6.93	50.80	9.65
9	1896-1900	211	179.15	6.92	46.20	5.26	55	180.53	6.51	46.49	5.34
10	1901-1905	260	179.08	6.14	41.25	4.96	55	178.62	5.83	40.87	5.02
11	1906-1910	322	178.46	6.12	35.81	4.46	55	178.07	6.92	36.15	4.98
12	1911-1915	291	179.04	6.57	32.22	5.45	55	178.87	7.65	31.64	5.00
13	1916-1920	248	179.36	5.81	26.21	5.37	55	179.31	5.90	27.02	6.11
14	1921-1925	223	179.30	5.80	23.70	5.40	55	180.07	5.81	22.95	5.00
15	1926-1930	126	181.37	5.85	25.79	1.51	55	180.07	4.90	25.42	1.40
16	1931-1935	242	180.76	5.89	21.11	1.43	55	181.11	6.01	21.15	1.48
17	>1935	61	180.03	5.35	18.00	0	55	180.27	5.43	18.00	0

Table 20. Summary Data in the Analysis of Secular Change in the Maximum Cranial Length (MCL) in Males.

Cohort	YOB Range	<i>Raw Data</i>					<i>Random Sample for equal n</i>				
		N	Mean MCL	SD_{MCL}	Mean AGE	SD_{AGE}	N	Mean MCL	SD_{MCL}	Mean AGE	SD_{AGE}
1	<1860	8	194.13	5.89	53.25	3.15	-				
2	1861-1865	23	188.35	7.49	56.52	16.99	-				
3	1866-1870	32	189.91	7.99	57.75	20.42	30	189.50	8.09	55.93	19.78
4	1871-1875	55	189.65	5.54	57.80	20.70	30	188.73	5.11	56.27	20.39
5	1876-1880	52	189.58	6.78	56.31	19.03	30	190.70	7.17	55.60	20.07
6	1881-1885	35	189.94	5.78	56.03	15.48	30	189.63	6.08	53.93	15.67
7	1886-1890	76	189.42	7.58	52.72	13.77	30	190.70	8.10	52.60	13.38
8	1891-1895	116	187.13	6.89	49.89	7.23	30	186.83	7.00	49.67	7.98
9	1896-1900	204	187.26	6.91	45.18	4.28	30	188.33	5.54	46.07	4.81
10	1901-1905	301	187.25	7.17	40.86	4.73	30	188.63	5.71	41.23	5.11
11	1906-1910	313	187.18	6.53	35.63	4.51	30	186.37	5.87	35.97	4.82
12	1911-1915	269	187.22	6.06	30.75	4.46	30	189.17	5.66	30.50	4.63
13	1916-1920	288	187.14	6.62	24.02	3.76	30	186.30	6.88	23.50	2.64
14	1921-1925	243	185.68	6.19	21.19	4.53	30	186.63	7.37	21.23	4.24
15	1926-1930	122	188.62	6.31	25.38	1.31	30	189.37	6.40	25.37	1.27
16	1931-1935	120	188.42	6.37	21.09	1.41	30	189.30	6.64	21.10	1.45
17	>1935	45	190.07	6.80	18.02	0.15	30	190.00	7.23	18.03	0.18

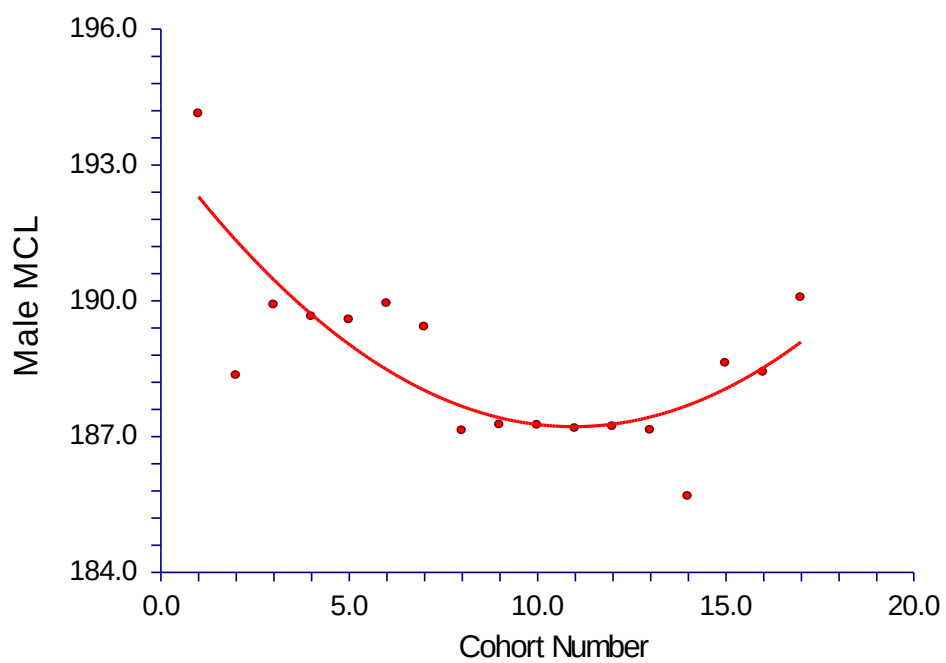
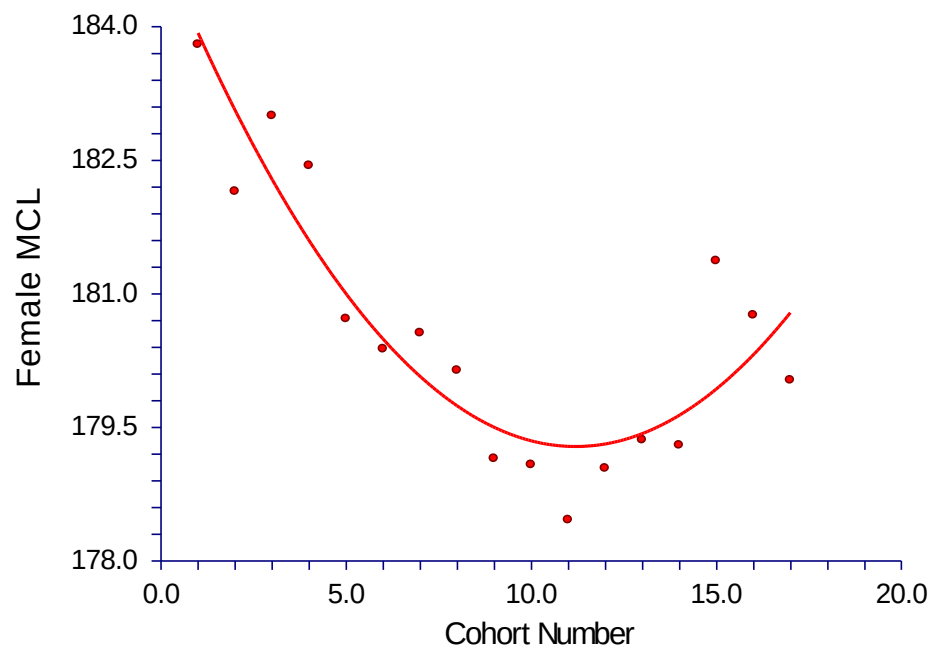


Figure 22. Scatterplot of average maximum cranial length for males and females born between 1860-1935. Each cohort represents 5 years. The quadratic regression lines are significant follow the trend in cephalic index.

Table 21. Summary Data in the Analysis of Secular Change in the Maximum Cranial Breadth (MCB) in Females

Cohort	YOB Range	Raw Data					Random Sample for equal n				
		N	Mean MCB	SD_{MCB}	Mean AGE	SD_{AGE}	N	Mean MCB	SD_{MCB}	Mean AGE	SD_{AGE}
1	<1860	5	148.60	4.67	52.00	3.46	-				
2	1861-1865	13	149.92	5.31	67.15	19.99	-				
3	1866-1870	33	150.36	4.83	54.33	19.16	-				
4	1871-1875	61	149.74	5.15	56.87	20.88	55	149.71	5.30	57.75	20.97
5	1876-1880	76	150.08	5.21	52.62	20.98	55	150.25	5.27	51.64	20.70
6	1881-1885	81	150.22	4.69	53.32	18.85	55	149.80	5.19	53.22	19.27
7	1886-1890	55	151.51	5.55	50.31	16.62	55	151.51	5.55	50.31	16.62
8	1891-1895	111	152.00	5.14	51.92	8.17	55	151.25	4.53	50.80	9.65
9	1896-1900	210	151.27	6.69	46.21	5.27	55	152.42	4.69	46.20	5.07
10	1901-1905	259	152.15	5.55	41.25	4.96	55	153.55	5.96	40.76	4.97
11	1906-1910	322	152.15	6.44	35.81	4.46	55	152.36	5.77	36.15	4.98
12	1911-1915	290	152.16	5.76	32.23	5.45	55	152.18	5.63	31.09	4.75
13	1916-1920	248	151.73	5.55	26.21	5.37	55	151.58	5.24	27.02	6.11
14	1921-1925	223	151.52	5.33	23.70	5.40	55	151.44	4.22	22.95	5.00
15	1926-1930	126	150.44	5.21	25.79	1.51	55	150.25	4.30	25.42	1.40
16	1931-1935	242	151.03	5.24	21.11	1.43	55	151.96	4.85	21.15	1.48
17	>1935	61	149.51	5.46	18.00	0	55	149.42	5.56	18.00	0

Table 22. Summary Data in the Analysis of Secular Change in the Maximum Cranial Breadth (MCB) in Males.

Cohort	YOB Range	Raw Data					Random Sample for equal n				
		N	Mean MCB	SD_{MCB}	Mean AGE	SD_{AGE}	N	Mean MCB	SD_{MCB}	Mean AGE	SD_{AGE}
1	<1860	8	153.38	4.87	53.25	3.15	-				
2	1861-1865	23	155.65	5.96	56.52	16.99	-				
3	1866-1870	32	154.88	7.78	57.75	20.42	30	154.83	7.86	55.93	19.78
4	1871-1875	55	155.71	5.19	57.80	20.70	30	155.23	4.67	56.27	20.39
5	1876-1880	52	156.83	5.92	56.31	19.03	30	158.53	6.44	55.60	20.07
6	1881-1885	35	157.14	4.93	56.03	15.48	30	157.30	5.20	53.93	15.67
7	1886-1890	76	157.12	5.78	52.72	13.77	30	156.63	5.44	52.60	13.38
8	1891-1895	116	156.91	6.02	49.89	7.23	30	156.83	4.92	49.67	7.98
9	1896-1900	202	157.72	5.73	45.21	4.28	30	158.27	5.15	46.47	5.01
10	1901-1905	301	156.92	6.89	40.86	4.73	30	157.90	5.37	41.23	5.11
11	1906-1910	313	157.53	6.75	35.63	4.51	30	157.30	5.25	35.97	4.82
12	1911-1915	269	157.58	5.51	30.75	4.46	30	158.93	5.04	30.50	4.63
13	1916-1920	288	156.33	6.29	24.02	3.76	30	157.23	4.73	23.50	2.64
14	1921-1925	243	156.07	6.04	21.19	4.53	30	156.67	5.82	21.23	4.24
15	1926-1930	122	156.61	5.91	25.38	1.31	30	158.10	5.27	25.37	1.27
16	1931-1935	120	155.77	5.46	21.09	1.41	30	156.17	5.78	21.10	1.45
17	>1935	45	155.82	5.45	18.02	0.15	30	156.70	4.59	18.03	0.18

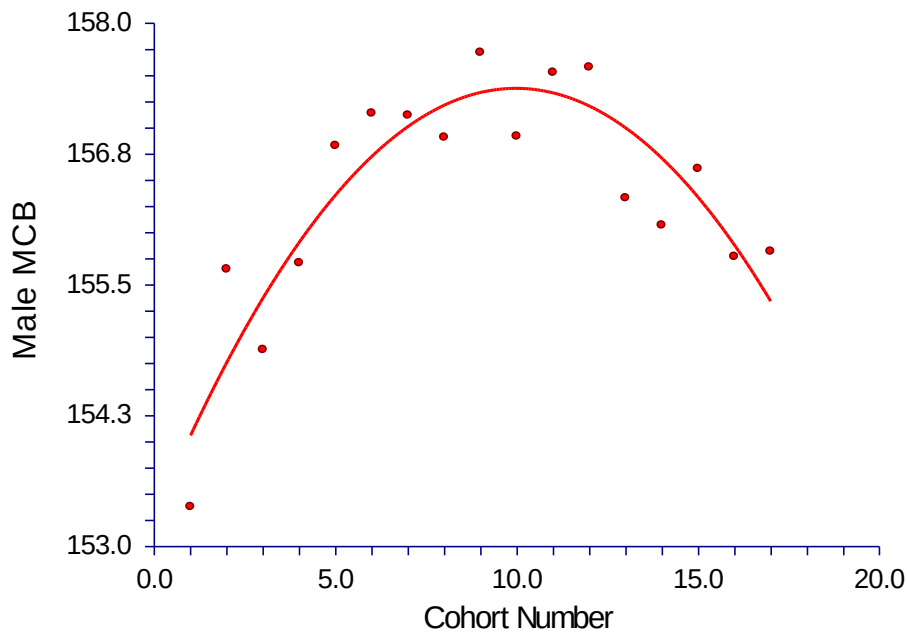
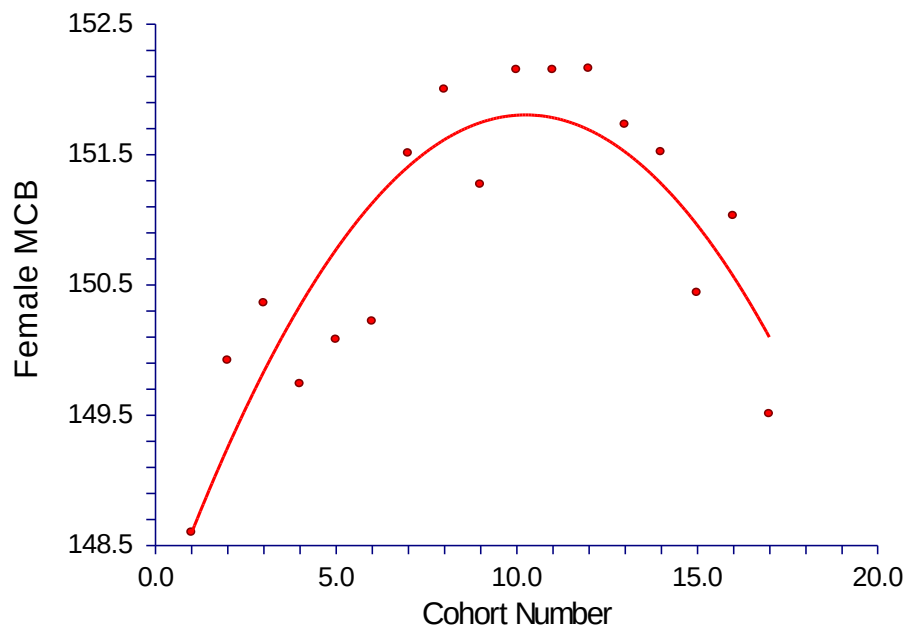


Figure 23. Scatterplot of average maximum cranial breadth for males and females born between 1860-1935. Each cohort represents 5 years. The quadratic regression lines are significant and mirror the trend in cephalic index.

Table 23. Summary Data in the Analysis of Secular Change in the Zygomatic Breadth (ZYB) in Females

Cohort	YOB Range	Raw Data					Random Sample for equal n				
		N	Mean ZYB	SD_{ZYB}	Mean AGE	SD_{AGE}	N	Mean ZYB	SD_{ZYB}	Mean AGE	SD_{AGE}
1	<1860	5	138.40	5.13	52.00	3.46	-				
2	1861-1865	13	135.15	6.72	67.15	19.99	-				
3	1866-1870	33	136.21	5.52	54.33	19.16	-				
4	1871-1875	61	135.21	4.37	56.87	20.88	55	135.07	4.53	57.75	20.97
5	1876-1880	76	134.16	5.64	52.62	20.98	55	134.45	5.94	51.64	20.70
6	1881-1885	81	134.43	5.05	53.32	18.85	55	133.55	5.09	53.22	19.27
7	1886-1890	55	136.11	5.04	50.31	16.62	55	136.11	5.04	50.31	16.62
8	1891-1895	111	134.57	4.97	51.92	8.17	55	134.00	4.86	50.80	9.65
9	1896-1900	215	134.53	7.10	46.13	5.23	55	133.76	5.41	46.85	5.53
10	1901-1905	262	134.73	5.22	41.24	4.94	55	135.85	5.26	40.67	4.73
11	1906-1910	325	134.60	7.37	35.80	4.44	55	136.78	12.34	36.38	4.89
12	1911-1915	295	134.78	5.59	32.18	5.42	55	134.67	5.62	30.96	4.53
13	1916-1920	251	134.02	5.88	26.18	5.35	55	134.47	5.38	27.44	6.36
14	1921-1925	218	133.81	5.40	23.82	5.41	55	134.44	6.45	23.20	5.11
15	1926-1930	126	134.39	4.97	25.79	1.51	55	133.76	4.35	25.42	1.40
16	1931-1935	242	135.26	5.01	21.11	1.43	55	135.60	4.47	21.15	1.48
17	>1935	61	133.18	5.27	18.00	0	55	132.89	5.31	18.00	0

Table 24. Summary Data in the Analysis of Secular Change in the Zygomatic Breadth (ZYB) in Males

Cohort	YOB Range	Raw Data					Random Sample for equal n				
		N	Mean ZYB	SD_{ZYB}	Mean AGE	SD_{AGE}	N	Mean ZYB	SD_{ZYB}	Mean AGE	SD_{AGE}
1	<1860	8	143.38	4.50	53.25	3.15	-				
2	1861-1865	23	141.26	5.49	56.52	16.99	-				
3	1866-1870	32	143.81	6.17	57.75	20.42	32	143.81	6.17	57.75	20.42
4	1871-1875	55	143.25	5.45	57.80	20.70	32	143.59	5.86	58.88	20.38
5	1876-1880	52	143.27	6.88	56.31	19.03	32	143.16	6.76	59.56	18.92
6	1881-1885	37	143.49	5.27	56.19	15.07	32	143.63	5.15	54.84	15.60
7	1886-1890	76	143.12	5.86	52.72	13.77	32	142.50	6.49	53.81	13.04
8	1891-1895	116	142.19	5.28	49.89	7.23	32	141.81	5.74	50.13	8.12
9	1896-1900	210	142.27	6.54	45.12	4.23	32	142.78	5.76	46.47	5.14
10	1901-1905	302	141.48	5.46	40.85	4.73	32	141.78	4.30	41.47	5.36
11	1906-1910	316	142.37	6.27	35.60	4.49	32	143.22	4.83	35.91	4.37
12	1911-1915	270	142.00	5.56	30.75	4.45	32	141.78	7.37	30.47	4.42
13	1916-1920	289	140.09	5.81	24.02	3.75	32	140.66	5.37	24.25	3.62
14	1921-1925	235	138.25	5.96	21.29	4.57	32	138.13	5.98	20.31	3.27
15	1926-1930	122	141.37	5.73	25.38	1.31	32	140.97	5.36	25.59	1.32
16	1931-1935	120	140.77	5.30	21.09	1.41	32	140.13	5.01	21.25	1.55
17	>1935	45	139.33	5.10	18.02	0.15	32	138.72	4.62	18.00	0

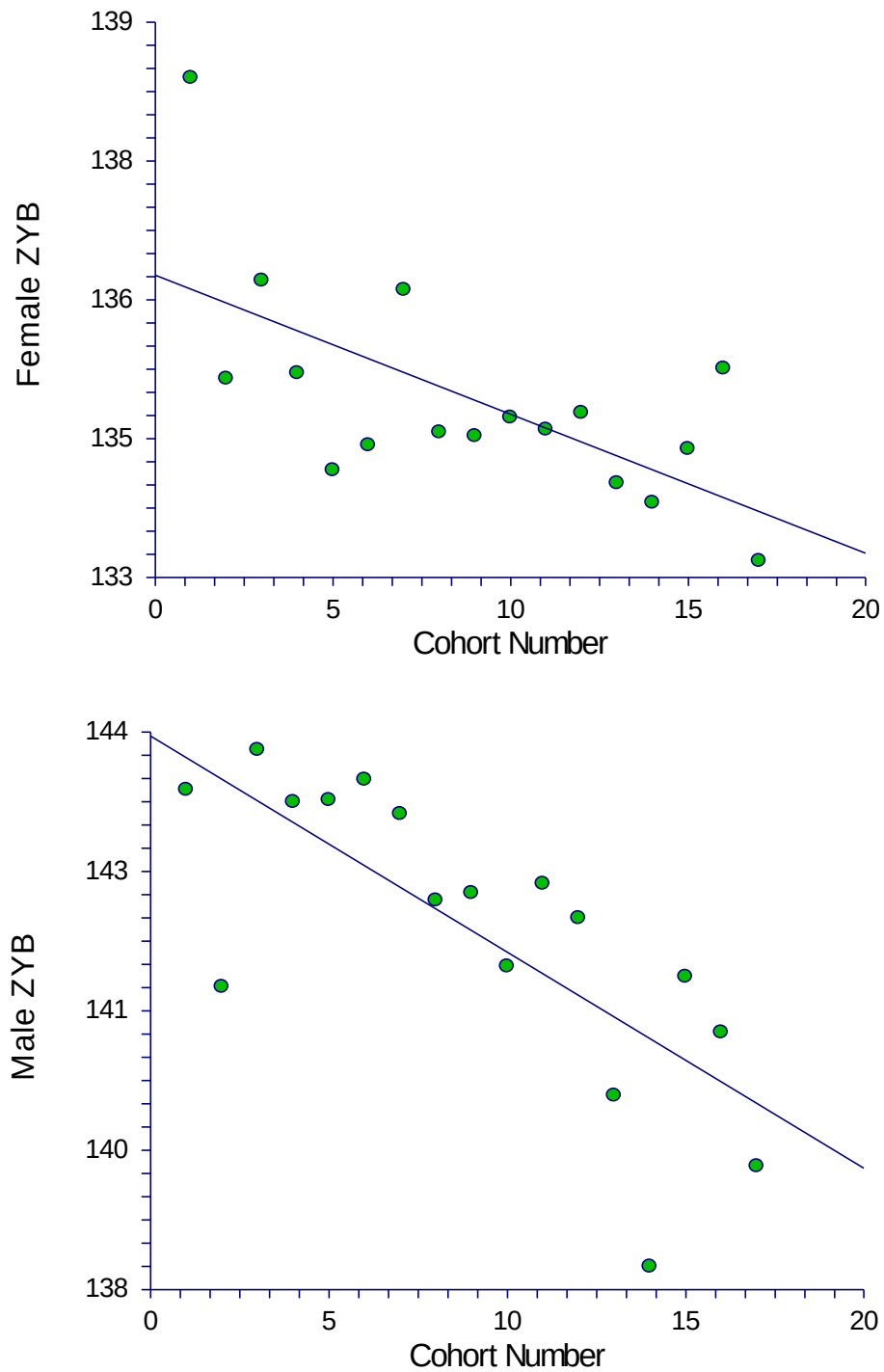


Figure 24. Scatterplot of average zygomatic breadths for males and females born between 1860-1935. Each cohort represents 5 years. The regression line is only significant in the male sample.

CHAPTER V

DISCUSSION

The goal of this study was to use the anthropometric data contained in the records of the *Institut für Deutsche Ostarbeit* (IDO) to assess regional variation and secular trends during an extreme period of change in Poland. In combination with other published data sources regional variation was assessed at three levels, town, municipality and county. Seven anthropometric traits were tracked over time to assess secular trends. A summary of the results of these analyses can be found in Table 25 and Table 26. A discussion of these results follows and concludes with an explanation of their significance to current and future research.

The results of the analyses of population structure are consistent across the three levels examined. Despite the claims that Poland is homogeneous, there is significant population structure present. Within each level of analysis genetic relationships tended to follow the pattern expected; genetic distances increased with larger geographic distances. Remarkably the largest average group differentiation (Min F_{ST}) was obtained at the level of municipality. It is uncertain why this is the case as one would expect that the highest group differentiation would be present at the level of towns, as these are more discrete units that are more geographically separated. It is possible that the way these data were sampled contributed to this result as sampling strategies by the original data collectors for towns and municipalities differed. The data for the analysis of towns was obtained from the IDO dataset whose goal was to describe the variation present in Poland, while the municipality dataset had the goal of equal representation (n) of each unit of analysis. It is possible that sampling of individuals in the IDO towns could overly represent minority groups, which would artificially inflate the within group phenotypic variance and possibly lower genetic differentiation between the towns in this analysis. Overall, Poland is much more differentiated than Ireland which is reported to have a minimum F_{ST} of 0.0087 (Relethford, 1997). At the municipality level minimum F_{ST} estimates using craniofacial dimensions (0.0476) are similar to that of head and face measurements of Algonquian speaking Native Americans reported to have minimum F_{ST} of 0.0547 (Jantz and Meadows, 1995). Additionally, analysis of population structure in the Sioux and Assiniboine reported a minimum F_{ST} 0.0332 (Wescott and Jantz, 1999) which is below that of obtained in the analysis of municipality in this study.

The data in this study allowed for the separate analysis of population structure in males and females to determine whether sex-biased migration patterns are present in the Polish population. Using the analysis at the level of municipality as an example, population structure patterns, as depicted in the plots of the principle coordinate analysis of the R matrix, differed between males and females indicating that the genetic similarity/dissimilarity between populations is somewhat sex dependent. This could be due to a pattern of sex-biased migration where one sex may tend to migrate more or

Table 25. Summary Table of Results from the Analysis of Regional Variation.

<i>Level of Analysis</i>	<i>Significant difference in F_{ST} between the sexes</i>	<i>Significant difference in F_{ST} between cranial and body dimensions</i>	<i>PCA Patterns approximate geographic distance</i>
Town	No	In Males Only	Yes
Municipality	No	In Females Only	Yes
County	No	No	Yes

Table 26. Summary Table of Results from the Analysis of Secular Change.

<i>Variable</i>	<i>Sex</i>	<i>Significant Trend</i>	<i>Change from YOB 1860 to 1924</i>
Height (HGT)	Male	Yes; Positive Linear	+7.2cm
	Female	Yes; Positive Linear	+9.0cm
Shoulder Breadth (SHB)	Male	No	-0.5cm
	Female	No	+1.7cm
Lower Limb Length (LLL)	Male	Yes; Positive Linear	+4.3cm
	Female	Yes; Positive Linear	+3.2cm
Cephalic Index (CEI)	Male	Yes; Non-Linear	-0.1cm
	Female	Yes; Non-Linear	-0.3cm
Maximum Cranial Length (MCL)	Male	Yes; Non-Linear	-0.4cm
	Female	Yes; Non-Linear	-0.5cm
Maximum Cranial Breadth (MCB)	Male	Yes; Non-Linear	+0.1cm
	Female	Yes; Non-Linear	+0.3cm
Zygomatic Breadth (ZYG)	Male	Yes; Negative Linear	-0.5cm
	Female	No	-0.4cm

less to certain areas as compared to the other. When looking at minimum F_{ST} values at first glance it also appears that the female population is on average more differentiated than that of the male population; however, when one takes into consideration the confidence intervals of these measurements it is evident that the estimates of group differentiation overlap. This is not the pattern that we would expect to see if the rate of migration for females was significantly higher than that of males (Prugonelle and Meeus, 2002). In general rates of migration in females have been reported to be significantly higher than that of males due to the practice of patrilocal, where females move to their husband's residence after marriage (Seielstad et al., 1998). This has been common practice in Poland and so it is interesting that this pattern is not significant in this analysis. It is possible that patrilocal is practiced at a smaller scale than that demonstrated by Prugonelle and Meeus (2002) and Seielstad et al. (1998). If females were to migrate within the same town, municipality or county this analysis would fail to detect this migration pattern. Further research is necessary.

Differences in minimum F_{ST} estimates obtained using cranial versus body dimensions were not consistent across the three levels of analysis. At the level of town, body dimensions exhibited significantly more differentiation in males while at the level of municipality cranial dimensions in females were more differentiated. While these findings are inconclusive they are consistent with the contradictory findings of previous studies. In some cases cranial dimensions are demonstrated to be more differentiated (Relethford, 1997); a finding that is consistent with the assumption that cranial dimensions are more genetically determined. While in others (Jantz and Meadows, 1995; Wescott and Jantz, 1999) minimum F_{ST} of cranial dimensions are significantly smaller than that of body dimensions. Clearly this is one question that cannot be resolved by the current analysis. More research is necessary, ensuring that the same cranial and body measurements are used to determine whether this is a population specific phenomenon or something that reflects the differences in the pattern of growth and development of the cranium and postcranium.

Some significant secular trends in body size and limb proportions were observed; however, not all of the variables investigated exhibited significant trends (Table 26). Shoulder breadth was the one body dimension to exhibit an insignificant secular trend. This result is not surprising as documented secular trends in shoulder breadth have not been frequently reported and when they have recorded secular trends were not large in magnitude (Kažoka and Vētra, 2008).

Height is one of the most investigated anthropometric measurements in the analysis of secular trends. It has been consistently demonstrated that as conditions improve, the height of a population increases (Komlos and Cinnirella, 2007). The most significant secular trend in body dimensions was observed as an increase in height in both males and females. This indicates that living conditions were improving for the Polish population, despite the stress and disruption of the World Wars. The rate of increase differed between males and females indicating that there is some degree of

inequality in the improvement of the environment. The female sample over this time period steadily increased in stature for a total increase in 9cm (if one discounts the abnormally tall individual in the first birth cohort) while males only attained an increase of 7.2cm in the same period of time.

Though surprising an increasing trend in stature during periods of stress has already been documented in Eastern Europe and Poland. Webb et al. (2008) demonstrated an increasing trend in height in individuals born during and after World War II (1933 to 1957) in Russia, Poland and the Czech Republic. Despite an economic crisis in the early 1980s Bielicki and Waliszko (1991) observed an unabated increasing trend in stature in a survey of 19 year old Polish conscripts in 1976 and 1986. The results of the current research indicate that this is a trend extends beyond this time period and is present well before the start of World War I, and the fact that it continues unabated until the present despite dramatic changes in Poland is remarkable. Bielicki et al. (2012) feel that observations of increasing stature during periods of economic decline are unlikely to be entirely due to delayed maturation. Rather it may be the consequence of the very complex economic situation before, during and after the world wars, with even the hardships experienced during this time serving as a selective agent for the survival of stronger, healthier children (Bielicki et al., 2012).

As most of the secular trend in height has been attributed to an increase in the length of the lower limb (Meadows and Jantz, 1995; Malina et al., 2004) it was hypothesized that the Polish population would also exhibit this trend. A significant increase in leg length was observed in both males (+4.3cm) and females (+3.2cm), but this increase only partially accounts for the increasing trend observed in stature (Males 59.72%; Females 35.56%). Although the other major component to height, the trunk, could not be assessed due to small sample size, it can be inferred that an increase in trunk and leg length is responsible for the overall increase in height over the study period.

There is a considerable difference between the sexes in the contribution that leg length has to the increase in stature over the study period. It is well documented that leg length is a strong indicator of the quality of the environment (Frisancho et al., 2001; Bogin, 2012; Wadsworth et al., 2002; Malina et al., 2004; Li et al., 2007; Dasgupta et al., 2008; Floyd, 2008), and so it appears by this measure that males are experiencing better environmental conditions than females during this time period. However, as these results are similar to those reported by Malina et al. (2004), where an increase in leg length was responsible for 70% of the increase in height in males but only 44% in females, it is possible that these differences correspond to sex differences in growth and maturation. More research is necessary to further explore these concepts.

Zygomatic breadth is the only cranial dimension to exhibit a significant linear trend (only in males), indicating that the face is narrowing over time. A narrowing face has been previously demonstrated in Poland to correspond with better socioeconomic status (Lorkiewicz, 2005). If this is the case, zygomatic breadth at least in males, follows

a similar pattern of secular change as that observed in body dimensions such as stature, and differs from that of the other cranial measures investigated in this study. This may be reflective of the similarity in growth patterns that the facial skeleton, stature and long bones share (Jantz and Jantz, 2000). As the magnitude of this trend is much lower than that of cranial vault measures, these results support the findings of Jantz and Jantz (2000) who propose that vault dimensions may be sensitive to environmental changes that occur much earlier in life than those of the face and postcranial elements. Following this reasoning it may be that concordance between cranial vault and postcranial secular trends may indicate a consistent environment throughout growth and development; whereas discordance may demonstrate that the environment of early childhood differed from that experienced during later periods of growth. More research is necessary to further understand the differential sensitivity to environmental conditions between different parts of the body.

As mentioned, the trends observed in body dimensions are not the same as those seen in some cranial dimensions. High values of cephalic index, the ratio of cranial breadth to length, are associated with lower socioeconomic status. While a decrease in cephalic index is observed in both males and females it is not a linear trend that is equally expressed over time. Up until 1901 cranial index is increasing, it plateaus and then begins to decline in individuals born after 1926. As the change in cephalic index is due to change in both cranial breadth and length similar patterns of increase and decrease are observed in all three measures.

If change in cranial dimensions can be thought of as reflecting stresses early in development, one could argue that conditions for early development, fetal and early childhood did not improve until birth year 1926. While conditions later in development were consistently improving resulting in a more consistent linear trend of increasing height. By taking this approach one can argue that cranial dimensions, namely cephalic index, were more influenced by detrimental effects of World War I (1914-1918) and the agrarian reforms and crises that occurred during late 19th century where massive crop failures drove the cost of grain and potato to double (Kopczynski, 2007). Additionally, after incorporation of Poland into the Russian Empire after 1864 and the abolishment of custom barrier the market was open for cheap food from Russia (Kopczynski, 2007). While this was positive for individuals living in the cities, the rural populations suffered as they now had to compete. As this dataset is primarily composed of rural populations the effects of the agrarian crisis should be evident in this data series. While we see a consistent increase in height over the entire time period investigated, cranial dimensions that of cephalic index and maximum cranial breadth and length provide a different picture. Changes in cephalic index and maximum cranial breadth could illustrate the detrimental effects that the agrarian crisis and World War I had on the population, with the reversal of this negative trend observed in males and females first evident in birth cohorts after 1916. It could also indicate that it takes longer for trends in cranial dimensions to respond to positive changes in the environment after a significant

insult. Hopefully additional datasets will be made available so that this can be further evaluated.

Does the existence of secular change invalidate population structure findings? As Relethford (2004:381) states “the question of whether plasticity exists is different from the question of whether it is the major influence on cranial variation”. Just because secular trends are present, does not imply that it is the major influence on variation of anthropometric measurements. As such plasticity as demonstrated in significant secular trends in this study do not necessarily obscure underlying genetic differences between populations, especially if the secular trend operates on all populations in the same way (Relethford, 2004; Relethford, 2007). Therefore the population structure findings in this dissertation are valid under our current understanding of quantitative traits.

In summary this dissertation has demonstrated that:

- There is significant regional variation and population structure in Poland
 - In general genetic distances mirrored geographic distance
 - There was no significant difference in the degree of differentiation (F_{ST}) between the sexes.
 - Patterns of regional variation obtained using cranial and body dimensions differed, but did so inconsistently.
- There is significant secular change in body size in Poland
 - Patterns of secular trends as well as magnitude differed between the sexes
 - Secular trends in stature were in part due to a significant increase in the length of the lower limb
- There is significant secular change in cranial dimensions in Poland
 - Changes in cephalic index were due to changes in both cranial length and breadth.
 - Secular trends in cranial dimensions are as significant as those of body size though different patterns between the two were observed.

Looking Forward

This dissertation marks the beginning of the analysis of the anthropometric data contained in the records of the *Institut für Deutsche Ostarbeit*. It is the first multivariate analysis of regional variation in Poland. As significant variation between populations was found in these data it is hoped that this analysis will refute the assumption of homogeneity and serve as a catalyst to further analyses of regional variation in Poland. As anthropometric data has been collected in Poland since the Second World War an analysis of regional variation with data representative of the whole or different parts of

the country could provide a deeper understanding of the population of Poland and of the loss of population diversity as a result of World War II.

The secular trends examined in this dissertation provide the context for trends that have been documented since the 1940s. It is hoped that integration of data sources representing individuals born after this dataset will occur. This in combination with the collaboration of Polish historians has the potential for creating an extended model of the effects of high stress on individuals through the World Wars, communism, and eventual establishment of the Republic of Poland.

This data source is vast and multifaceted. Many different types of questions can be addressed using the anthropometric data, dermatoglyphics (not yet analyzed) and extensive ethnographic information. Tests of new statistical methods and evaluation of confounding factors to analyses, such as age in analysis of secular change and the presence of secular trends in the analysis of population structure can be addressed using this series. It is my hope that this resource will be used, analyzed and evaluated to its maximum potential.

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APPENDIX

APPENDIX A
Data Entry Sheets

Figure A- 1. Data Sheet from IDO Subseries 1 (USHMM, 2008a)

M		Ort der Aufnahme		W	
Nr.	Zuname	Vorname	Beruf	Konf.	Kinderzahl u. Alter
	Wohnort	Kreis	Mädchenname	n-hat	1:87
Tag der Aufnahme	Volkstum	*	in	led., verh.	Alter
12.5.42	Polen	17.5.1892	Charlowe	mit Nr. 1932 verw., gesch.	59.11
Vater	Vorname	Beruf	*	in	jetziger Wohnort
	Zuname	Selbständig?	Nr.	Charlowe	gest.
Mutter	Vorname	Mädchenname	*	in	jetziger Wohnort
	Katharina	Klajan	Nr.	Charlowe	gest.
Vaters Vater	Vorname	Beruf	Todesur-		
	Zuname	*	in	Charlowe	Kinder-
Vaters Mutter	Vorname	Todesur-			Kinder-
	Mädchenname	*	in	Charlowe	
Mutters Vater	Vorname	Beruf	Todesur-		
	Zuname	*	in	Charlowe	Kinder-
Mutters Mutter	Vorname	Todesur-			Kinder-
	Mädchenname	*	in	Charlowe	
Geschwister:			Schulbesuch: Volksschule, Cymnasium, Hochschule		
Vorname, Zuname, vergl. Wohnort Nr.			Jahre		
1.	Anita	Interessen: Handwerk, Zeichnen, Bücher, Wissenschaft			
2.	Frankisch	Musik,			
3.		Sprachen: pol., Führerschein:			
4.		Vereinszugehörigkeit:			
5.		Wohnverhältnisse 2 Zimmer			
6.		Besitzverhältnisse: Landbesitz 2 1/2 Hektar			
7.		Wert der Gebäude, Werkstätten, Einrichtung			
8.		Zloty			
Krankheiten, in der Familie: Geisteskrankheiten, Nervenkrankheiten, Missbildungen, Tuberkulose, Verwachsungen, Blindheit, Taubheit.					
Bemerkungen über Abstammung, Familiengeschichte usw.:					

Figure A- 3. Demographic Side of a Two Sided Datasheet from Subseries 4 (USHMM, 2008a).

114/127 1205 55.78

Körperhöhe	1954-40	171	Gestalt:	schlank - hoch breit - hoch mittel untersetzt zierlich
Sitzhöhe		890 52.01		
Größte Breite		301 17.59		
Schulterbreite		395 23.08		
Handbreite		91	Stirn:	hoch, niedrig steil, geneigt fliehend gewölbt, flach Stirnhöcker
Handlänge		200		
Umfang des Handgelenks		185		
Kopfumfang		557		
Kopfhöhe		246	Augen:	Lidverwachsung ✓ Oberlidraum: hoch, mittel, niedrig
Kopflänge Kopfbreite		176 10.28	Lidspalte:	weit, mittel, eng
Ohrhöhe		165		
Kleinste Stirnbreite		107		
Jochbogenbreite		145	Nase:	eingebogen, ausgebogen gerade, wellig
Unterkieferwinkelbreite		112		
Morphol. Gesichtshöhe		125	Nasenwurzel:	hoch, mittel, tiefliegend
Nasenhöhe		60 48.1		
Nasenbreite		34	Lippen:	schmal, mittel, wulstig
Nasenboden		26		
Nasenflügeltiefe		36	Kinn:	zierlich, mittel, massig vorspringend, senkrecht, fliehend
Augenabstand		29		
Augenfarbe		1a	Ohrläppchen:	fehlend, verwachsen, frei
Haarfarbe		9a 10.5	Zinterhaupt:	gerade, gewölbt, ausladend
Haarform:	straff, schlicht, weitwellig engwellig, lockig, kraus			
Längenbreitenindex		93.75	Jasomandibularindex	77.24
Längenhöhenindex		68.46	Morphol. Gesichtindex	86.21
Breitenhöhenindex		73.03	Nasenindex	56.67
Frontoparietalindex		64.85	Handindex	45.50
Jugofrontalindex		73.79		

Figure A- 4. Anthropometric Side of a Two Sided Datasheet from Subseries 4 (USHMM, 2008a).

Ort: A: G: LZ:

Familienname
nazwisko *Pobrányi*

bei Frauen Geburtsname
panieńskie nazwisko

Vorname
imie *Imre Georg*

geboren am
data urodzenia *1920 V 21*

geboren in (Ort, Kreis, Woj., Staat)
urodzony w (miejscowość, okręg, woj., państwo) *Szekesfehervar*

Volkszugehörigkeit
przynależność narodowa *Ungarn Deutschland*

Muttersprache
język ojczysty *deutsch*

Staatsangehörigkeit
przynależność państwowa *"*

Beruf (Art und Zeit)
zawód (rodzaj i czas) *Postenmacher*

Familienstand (led., verm., gesch., verw.)
stan rodzinny, (kaw., zon., rozwiedziony, ponowił)

Konfession, auch frühere, Zeitpunkt des Konfessionswechsels
wyznanie, również poprzedz., okres zmiany wyznania

Geschlechterzahl:	männlich:	weiblich:	
rodzaj liczby:	rodzaj liczby:	rodzaj liczby:	
	lebend)	zmarłe:	
Kinderzahl	żywe)	männlich	weiblich
ilosc dzieci	tot)	zmarłe	zmarłe
	umarto)		

Figure A- 5. Demographic Side of a Two Sided Datasheet from Subseries 6 (USHMM, 2008a).

Körpergröße	100.0	1689	Ganze Kopfhöhe	100.0	389	218
Gnathionhöhe	821	1471	Halslänge	326	127	71
Sternumhöhe	829	1400	Rumpflänge	331	100.0	560
Akromionhöhe	840	1480	Armlänge	661	896	139.0
Daktylionhöhe	320	641	Beinlänge	515	100.0	155.2
Iliosspinalhöhe	539	910	Schulterabfall		36	2.0
Symphysionhöhe	199	336			100.0	600
Schulterbreite	163	275			88	491
Beckenbreite						
Haarform:	Kopfumfang					
straft, schlicht	Gr. Kopflänge		849	100.0	18.5	
weitwellig, engwellig	Gr. Kopfbreite		734	100.0	865	16.0
lockig, englockig	Ohrhöhe d.K.		624	850	973	13.6
kraus, engkraus			350	7250	8649	5.120
Haardicke:	Kl. Stirnbreite		509	694	600	11.1
dick, mittel, dünn	Jochbogenbreite		651	888	100.0	14.2
Haarpigmentwert:	Unterkieferwb.		486	663	747	10.6
Haargrundton: schwarz	Morph. Ges.h.		591	100.0	908	12.9
asch, grau, silber	Phys. Oberges.h.		376	635	577	8.2
gelb, gold, bronze	Phys. Ganzges.h.			100.0		
rötlich, bläulich	Stirnhöhe					
Haarprobe:	Nasenhöhe		294	100.0	6.4	
Bartform:	Oberlippenhöhe		83		1.8	
geteilt, mittel, ungeteilt	Kinnhöhe		215		4.7	
Bartstärke:	Nasenbreite		170	100.0	578	3.7
stark, mittel, schwach	Br. zw. d. inn. Aw.		56/46	919/270	534/150	34/10
Bartpigmentwert:	Nasenbodentiefe			676	390	2.5
Bartgrundton:	Nasenflügel			100.0		
asch, grau, bronze	Pigmentfleckenbildg.:		Faltenbildungen der Aw			
gelb, gold, rötlich	fehlt, schwach,					
Lippenfarbe:	mittel, stark					
blassrosa, rosa, rot	Häufungsstellen:					
hellkirsch, dunkelkirsch	Pigmentierung der Awtl.		Augenfarbe: grau blau			
hellviolett, dunkelviolett			Augenpigmentwert:			
oliv, bläulich						
Hautdicke:						
dick, mittel, dünn						
Hautfarbe:						
rosig						
hellfahl, grau						
hellgelblich, dunkelgelb						
hellbräunlich, dunkelbräunl.						
helloliv, dunkeloliv						
bläustichig						

Figure A- 6. Anthropometric Side of a Two Sided Datasheet from Subseries 6 (USHMM, 2008a).

Volk, Stamm <i>Poln.</i>		Alter	Altersklasse	Untersucher	L. Zl. <i>15</i>	
Wohnort <i>Argentinien</i>		Familienname <i>Rlich</i>		Veröffentlichung, Quelle	Film Nr.	
Geburtsort <i>Argentinien</i>		Vorname <i>Hans</i>		R		
Kreis usw.		Beruf/Mädchenname		Staatsangehörigkeit	Kinder ges.	lebend tot
Muttersprache <i>poln.</i>	Konfession <i>kat.</i>	geboren am <i>18.1.27</i>	Familienstand	V BS	M	K G

Meßverfahren		Größe Kopfhöhe pr. vertex-gnathion	16	1 0 0 0			
Hinterhaupt schwach abfallend rück steil flach gewölbt ausladend / spitz verrundet kuglig		Ohrhöhe des Kopfes (pr.) vertex-tragion	15				<i>131</i>
Schuppe stark abgesetzt verlaufend		Größe Kopflänge globella-episthokranion	1		1 0 0 0		<i>113</i>
Stirnhöcker 0 1 2 3 Brauenwulst 0 1 2 3 4		Präaurikularabschnitt pr. tragion auf die Gr. Kopflänge					
Stirnwalst 0 1 2 3 4 Glabellarwulst 0 1 2 3		Postaurikularabschnitt 1 - Präaurikularabschnitt					
Nasenwurzel sehr flach mittel hoch / sehr schmal mittel breit		Größe Kopfbreite euryon-euryon	3		1 0 0 0		<i>152</i>
Kopfhaut straff schlicht flach weit eng wellig lockig gekräuselt locker dicht kraus füllig spiralig / Dicke 1 2 3		Kleinste Stirnbreite frontotemporale-frontotemporale	4				
Pigment n. R grau asch silber bronze gelb gold rot kastanien braun blau schwarz lich		Jochbogenbreite zygion-zygion	6	A 1 0 0 0			
Brauen heller dunkler / Razel 0 1 2 3 4		Unterkieferwinkelbreite gonion-gonion	8				
Haarbreite 0 1 2 3 4		Wangenbeinbreite angulare-angulare			1 0 0 0		
Wimpern heller dunkler / lang mittel kurz stark geschweift gerade		Gesichtstiefe pr. pronasale-angulare					
Barthaar geteilt verwischt ungeteilt		Physiognomische Gesichtshöhe trichion-gnathion	17				
Bildungsstärke 0 1 2 3 4		Morpholog. Gesichtshöhe nasion-gnathion	18		1 0 0 0		
Pigment n. grau asch silber bronze gelb gold rot kastanien braun blau schwarz lich		Physiogn. Obergesichtshöhe nasion-stomion	19				
Augenfarbe n. 12 R L hell dunkel schwarz kastanien braun hasel orange gelb grün violett schiefer wasser milch grau blau albino klara weiß gelb grau braun blau lich		Morphol. Obergesichtshöhe nasion-prosthion	20				
Lippen blaß dunkel rosa rot kirsch violett blau oliv grau lich Lippenleiste 0 1 2 3 4		Physiognomische Stirnhöhe trichion-nasion	24				
Zähne sehr klein mittel groß / Prodentie Gebiß unregelmäßig / alveolare Prognathie Zangen Scheren Dach biß		Nasenhöhe nasion-subnasale	21		1 0 0 0		
Ohr absteigend anliegend		Oberlippenhöhe subnasale-stomion	26				
Muschel absteigend anliegend		Untergesichtshöhe stomion-gnathion	28				
Saumeinrollung 0 1 2 3 bandförmig		Lippenhöhe labrale superius - labrale inferius	25				
Haut fein grob porig / samtig weich rauhe feucht trocken fettig / Dicke 1 2 3 Durchscheinen der Blutgefäße 0 1 2 3 4		Mundspaltenbreite cheilion-cheilion	14		1 0 0 0		
Hautfarbe n. hell dunkel rötlich grau weiß gelb rot braun oliv blau schwarz lich		Nasenbreite alare-alare	13			1 0 0 0	
Bräunung 0 1 2 3 4 Pigmentflecken 0 1 2 3 4		Nasenwangentiefe pr. pronasale-postnasale	22a	1 0 0 0			
Häufungsstellen		Nasenbodenlänge pr. pronasale-subnasale	22				
Augenwille pigm. oben unten Ring Fläche 1 2 3		Höhe der Nasenwurzel pr. hyperhinton-entokanthon					
Fallenbildgen d. Awtle.		Abstand d. inn. Augenwinkel entokanthon-entokanthon	9	A			
Nägel Krümmung längs 0 1 2 3 4 quer kurz mittel lang / groß mittel klein Fächer Trapez Oval Rechteck Rund Quadrat Mondfarbe rasig weiß gelb blau lich		Pupillenabstand	12				
Anomalien, Deformationen		Abst. d. äuß. Augenwinkel ektokanthon-ektokanthon	10		1 0 0 0		
Blutgruppe		Länge der Lidspalte ektokanthon-entokanthon	11				
Blutfaktor		Abstand d. kn. äußeren Augenhöhlenränder in Höhe d. äuß. Lidspaltenendes 10(1)					
Ohrlänge 29/31 1 0 0 0							
Ohrbreite 30/32							
Horizontaler Kopfumfang 45							

Institut für Deutsche Ostarbeit, Krakau - Anthropologisches Erhebungsblatt							
Bildblatt	Soziologie	Haarproben	Abformungen	Gebiß	Akzentafel		
Morphologie	Psychologie	Haarskizze	Abdrücke H F	Phonogramm	Sippennachweis		
Kopfumrisse	Demographie	Physiologie	Umriss H F	Röntgenogramm	Sippenfotel	Dr. Plügel	

Figure A- 7. Demographic and Anthropometric Side of a Two Sided Datasheet from Subseries 7 (USHMM, 2008a).

Volk	Ort	Alter	Altersklasse	L. Zl.
Meßverfahren			Körpergröße	1 A 1 0 0 0 142.6
Körpergewicht 71	Konstitutionstyp	Höhe des Ohreingangs	2	
Knochenbau	Ernährungszustand	des Nasenbodens	3	
Körperfülle	Muskulatur	des unt. Kinnrandes	3(1)	
		gnathion	4	
		d. ob. Brustbeinrandes	5	
		suprasternale	6	
		des Nabels	6(1)	
		omphalion	7	
		d. ob. Schambeinrandes	8	
		symphyseon	9	
		des Damms	10	
		perineale	11	
		der Brustwarze	12	
		thellon	13	
		der Schulter	14	
		akromion	15	
		der Ellenfuge	16	
		radiale	17	
		der Griffelfuge	18	
		stylian	19	
		der Mittelfingerspitze	20	
		daktylion III	21	
		des Darmbeinkammes	22	
		iliacristale	23	
		d. v. Darmbeinstachels	24	
		iliospinale anterior	25	
		des Rollhügels	26	
		trochanteron	27	
		der Kniefuge	28	
		tibiale	29	
		der Knöchelspitze	30	
		sphyrian	31	
Ganze Kopfhöhe				
pr. vertex — gnathion [16]				
Halslänge				
pr. gnathion-suprasternale 29				
L. d. vord. Rumpfwand				
pr. suprasternale-symphysion 27				
Stammlänge				
23				
Brustwarzenlage				
pr. thellon — suprasternale 33				
Nabelhöhe				
pr. omphalion — suprasternale 31				
Unterleibshöhe				
pr. omphalion — symphysion 32				
Brustumfang b. r. Atmen 61				
bei Einatmen 61a				
bei Ausatmen 61b				
Atmungsspielraum 61a—61b				
Schulterabfall				
pr. akromion-suprasternale				
U. Ellen-Speichen-Br.				
pr. styl. ulnae-pr. st. radii 52(4)				
Br. d. u. Oberarmkopfs				
Ep. humeral-lat.-Ep. h. med. 52(3)				
Länge des Handrückens				
pr. styloid. ulnae / radii-phal. III 50				
Länge des Mittelfingers				
phalangion III—daktylion III 51				
Länge des Daumens				
phalangion I—daktylion I 51(1)				
Ganze Armlänge				
pr. akromion-daktylion III 45				
Arm ohne Hand				
pr. akromion-stylian 46				
Länge des Oberarms				
pr. akromion-radiale 47				
Länge des Unterarms				
pr. radiale-stylian 48				
Unterarm mit Hand				
pr. radiale-daktylion III 48(3)				
Länge der Hand				
pr. styloideus ulnae / radii-daktylion III 49				
Breite der Hand				
metacarpale radiale — metacarpale ulnare 52				
Ganze Beinlänge				
53				
Bein ohne Fuß				
54				
Oberschenkelhöhe				
[53—15] 55				
Unterschenkelhöhe				
pr. fibulare-sphyrian 56				
Länge des Fußes				
pternion-akropodion 58				
Breite des Fußes				
metatarsale medialis — metatarsale lateralis 59				
Transv. Brustdurchm.				
in Höhe des mesosternale 36				
Sagitt. Brustdurchm.				
in Höhe des mesosternale 37				
Schulterbreite				
akromion-akromion 35				
Brustwarzenabstand				
thellon-thellon 38				
Kleinste Rumpfbreite				
stärkste Einschnürung 39				
Darmbeinkammbreite				
iliacristale-iliacristale 40				
Vord. Darmbeinstachelbr.				
iliospinale ant.-iliosp. ant. 41				
Rollhügelbreite				
trochanter-trochanter 42				
Größte Hüftbreite				
breiteste Stelle 42a				
Spannweite				
17				
Transv. Brustdurchm.				
in Höhe des mesosternale 36				
Sagitt. Brustdurchm.				
in Höhe des mesosternale 37				
Schulterbreite				
akromion-akromion 35				
Brustwarzenabstand				
thellon-thellon 38				
Kleinste Rumpfbreite				
stärkste Einschnürung 39				
Darmbeinkammbreite				
iliacristale-iliacristale 40				
Vord. Darmbeinstachelbr.				
iliospinale ant.-iliosp. ant. 41				
Rollhügelbreite				
trochanter-trochanter 42				
Größte Hüftbreite				
breiteste Stelle 42a				
Spannweite				
17				
Transv. Brustdurchm.				
in Höhe des mesosternale 36				
Sagitt. Brustdurchm.				
in Höhe des mesosternale 37				
Schulterbreite				
akromion-akromion 35				
Brustwarzenabstand				
thellon-thellon 38				
Kleinste Rumpfbreite				
stärkste Einschnürung 39				
Darmbeinkammbreite				
iliacristale-iliacristale 40				
Vord. Darmbeinstachelbr.				
iliospinale ant.-iliosp. ant. 41				
Rollhügelbreite				
trochanter-trochanter 42				
Größte Hüftbreite				
breiteste Stelle 42a				
Spannweite				
17				
Transv. Brustdurchm.				
in Höhe des mesosternale 36				
Sagitt. Brustdurchm.				
in Höhe des mesosternale 37				
Schulterbreite				
akromion-akromion 35				
Brustwarzenabstand				
thellon-thellon 38				
Kleinste Rumpfbreite				
stärkste Einschnürung 39				
Darmbeinkammbreite				
iliacristale-iliacristale 40				
Vord. Darmbeinstachelbr.				
iliospinale ant.-iliosp. ant. 41				
Rollhügelbreite				
trochanter-trochanter 42				
Größte Hüftbreite				
breiteste Stelle 42a				
Spannweite				
17				
Transv. Brustdurchm.				
in Höhe des mesosternale 36				
Sagitt. Brustdurchm.				
in Höhe des mesosternale 37				
Schulterbreite				
akromion-akromion 35				
Brustwarzenabstand				
thellon-thellon 38				
Kleinste Rumpfbreite				
stärkste Einschnürung 39				
Darmbeinkammbreite				
iliacristale-iliacristale 40				
Vord. Darmbeinstachelbr.				
iliospinale ant.-iliosp. ant. 41				
Rollhügelbreite				
trochanter-trochanter 42				
Größte Hüftbreite				
breiteste Stelle 42a				
Spannweite				
17				
Transv. Brustdurchm.				
in Höhe des mesosternale 36				
Sagitt. Brustdurchm.				
in Höhe des mesosternale 37				
Schulterbreite				
akromion-akromion 35				
Brustwarzenabstand				
thellon-thellon 38				
Kleinste Rumpfbreite				
stärkste Einschnürung 39				
Darmbeinkammbreite				
iliacristale-iliacristale 40				
Vord. Darmbeinstachelbr.				
iliospinale ant.-iliosp. ant. 41				
Rollhügelbreite				
trochanter-trochanter 42				
Größte Hüftbreite				
breiteste Stelle 42a				
Spannweite				
17				
Transv. Brustdurchm.				
in Höhe des mesosternale 36				
Sagitt. Brustdurchm.				
in Höhe des mesosternale 37				
Schulterbreite				
akromion-akromion 35				
Brustwarzenabstand				
thellon-thellon 38				
Kleinste Rumpfbreite				
stärkste Einschnürung 39				
Darmbeinkammbreite				
iliacristale-iliacristale 40				
Vord. Darmbeinstachelbr.				
iliospinale ant.-iliosp. ant. 41				
Rollhügelbreite				
trochanter-trochanter 42				
Größte Hüftbreite				
breiteste Stelle 42a				
Spannweite				
17				

Figure A- 8. Anthropometric Side of a Two Sided Datasheet from Subseries 7 (USHMM, 2008a).

APPENDIX B
Anthropometric Measurements

Table A- 1. Key to the 3 letter code for anthropometric measurements used, including their German translation found in Figures A-1 through A-7.

	MEASUREMENT (LANDMARKS)	GERMAN (IDO FORMS)
ACH	Height of <i>Acromion</i>	Akromionhöhe
Age	Age	Alter
ARL	Arm Length	Armlänge
BIB	Bigonial Breadth	Unterkieferwinklebreite
CEI	Length-Breadth Index, cranial (max head breadth/max head length)*100	Längen-Breiten Index
CMB	Cranial Breadth at Mastoids (<i>mastoidale to mastoidale</i>)	-
COI	Cormic Index, Proportion of Sitting Height to Height (Sitting Height/Height)*100	-
CRC	Head circumference	Kopfumfang
CRH	Cranial (head) Height	Kopfhöhe
DAH	Height of <i>Dactylion</i>	Daktylionhöhe
EAH	Ear Height	Ohreingangshöhe / Höhe d Ohreingangs
EHH	Ear Height of Head	Ohrhöhe des kopfes
ESP	Eye Spacing	Augenabstand
FAH	Facial Height (<i>nasion to gnathion</i>)	Morpholo Gesichtshöhe
FAI	Facial Index (Bizygomatic Breadth/Max Cranial Breadth)*100	-
FLH	Height of left middle finger	Höhe d linken Mittelfingerspitze
FML	Face Length - Morphological	Morphol Gesichtslänge
FPI	Fronto-Parietal Index, cranial (min.frontal brth/max.head brth)*100	Fronto-Parietal Index
FRL	Length of Left Forearm with Hand	Länge d lk Unterarms mit hand
GNH	Height of chin at / Height of <i>Gnathion</i>	Höhe des unt Kinnrandes / Gnathionhöhe / Kinnhöhe
HAB	Hand Breadth	Handbreite / Breite der Hand
HAI	Hand Index (Hand breadth/Hand Length)*100	Hand Index
HAL	Hand Length	Handlänge / Länge der Hand
HGT	Height	Körpergröße / Körperhöhe
ICB	Iliac Crest Breadth (<i>iliocristale to iliocristale</i>)	Darmbeinkambbreite
ICH	Height of iliac crest (<i>iliocristale</i>)	Höhe des Darmbeinkammer
IEB	Breadth between the corners of the inner eye (<i>endocanthion to endocanthion</i>)	Br / Abst zw d inn Augenwinkeln
ISB	Iliac Spine Breadth (<i>iliospinale anterior to iliospinale anterior</i>)	Vord Darmbeinstachelbreite
JFI	Jugo-Frontal Index, cranial (min. frontal brth./bizy.brth)*100	Jugo-Frontal Index
JMI	Jugo-Mandibular Index, cranial (bigonial brth/bizy.brth)*100	Jugo-Mandibular Index
KFI	Kollman's Upper Facial Index (Upper facial height/bizygomatic breadth)*100	-
LFH	Lower Face Height (<i>stomion to gnathion</i>)	Untergesichtshöhe
LHI	Length-Height Index, cranial (head height/max head length)*100)	Längen-Höhen Index

Table A-1. (Continued)

	MEASUREMENT (LANDMARKS)	GERMAN (IDO FORMS)
LLI	Proportion of Lower Limb to Height (Length of Lower limb/Height)*100	-
LLL	Lower Limb Length	Ganze beinlänge / beinlänge
MAL	Whole Arm Length (<i>acromion to dactylion III</i>)	Ganze Armlänge
MCB	Greatest Cranial Breadth	Größte Kopfbreite
MCC	Maximum Cranial (head) Circumference	Größte kopfumfang
MCL	Greatest Cranial Length	Größte Kopflänge
MHB	Greatest Hip Breadth	Größte Hüftbreite
NAB	Nose Breadth (<i>alare-alare</i>)	Nasenbreite
NAD	Nasal Floor Depth	Nasenbodentiefe
NAH	Nose Height (<i>nasion to subnasale</i>)	Nasenhöhe
NAI	Nasal Index (nasal brth/nasal ht.)*100	Nasen Index
NAL	Nose Length	Nasenlänge
NFD	Nasal Floor Length (<i>pronasale to subnasale</i>)	Nasenbodenlänge
NPH	Upper Facial Height (<i>nasion to prosthion</i>)	Morphol Obergesichtshöhe
NSD	Nostril Depth	Nasenflugeltiefe
NSH	Upper Facial Height (<i>nasion to stomion</i>)	Physiogn Obergesichtshöhe
OEB	Breadth between the corners of the outer eye (<i>exocanthion to exocanthion</i>)	Br /Abst zw d aub Augenwinkeln
PEB	Pelvic Breadth	Beckenbreite
PUH	Height of pubis (<i>symphysis</i>)	Höhe d ob Schambeinrandes
RAH	Elbow Height (<i>radiale</i>)	Höhe der ellenfuge
RSL	Length of forearm (<i>radiale to stylium</i>)	Länge des unterarms
SBD	Sagittal Breast Diameter	Sagitt. Brustdurchm. in höhe des mesosternale
Sex	Sex	Geschlecht
SHB	Shoulder Breadth	Schulterbreite
SHD	Shoulder Drop (<i>acromion to suprasternale</i>)	Schulterabfall
SIH	Sitting Height	Sitzhöhe
SLH	Left Shoulder Height or when unspecified which	L Schulterhöhe / Höhe der Schulter
SPA	Span	Spannweite
STH	Height of Sternum (<i>suprasternale</i>)	Sternumhöhe
SYH	Styloid Height (<i>stylium</i>)	Höhe der Griffelfuge
TFI	Total Facial Index (morph. facial ht./bizygomatic brth.)*100	Morphol. Gesichtslänge Index
THH	Total head height (<i>vertex to gnathion</i>)	Ganze kopfhöhe
THL	Thoracic Length (<i>suprasternale to symphysis</i>)	L d vord Rumpfwand
TIH	Tibial (knee) Height (<i>tibiale</i>)	Höhe der Kniefuge
TLI	Proportion of Tibial Length to Lower Limb Length (Length of tibia/lower limb length)*100	-
TRL	Trunk Length	Stammlänge

Table A-1. (Continued)

	MEASUREMENT (LANDMARKS)	GERMAN (IDO FORMS)
UFH	Upper Face Length	Morph Obergesichtslänge
ULH	Upper Lip Height (<i>subnasale to stomion</i>)	Oberlippenhöhe
USH	Height Upper Sternal Border	Höhe d oberen Brustbeinrandes
WFB	Minimum Frontal Breadth	Kleinste Stirnbreite
WRC	Wrist Circumference	Umfang des handgelenks
YOB	Year of Birth	Geburtsort
ZYB	Zygomatic Breadth	Jochbogenbreite

Table A- 2. Anthropometric measurements available for each data source.

CODE	IDO 1&2	IDO 3 &6	IDO 4	IDO 7	TARN. GORY	RYBNIK	MAZURY	WARMIA	BOAS
ACH		Yes			Yes	Yes			
Age	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ARL		Yes							
BIB	Yes	Yes	Yes	Yes			Yes		
CEI	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CMB							Yes		
CRC	Yes	Yes	Yes						
CRH		Yes	Yes						
DAH		Yes			Yes	Yes			
EAH	Yes								
EHH	Yes	Yes		Yes					
ESP		Yes	Yes						
FAH	Yes	Yes	Yes		Yes	Yes	Yes	Yes	
FLH	Yes								
FML	Yes	Yes							
FRL	Yes								
GNH	Yes	Yes		Yes					
HAB		Yes	Yes						
HAI									
HAL	Yes	Yes	Yes	Yes					
HGT	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ICB	Yes			Yes	Yes	Yes			
ICH	Yes			Yes					
IEB	Yes	Yes		Yes					

Table A-2. (Continued)

CODE	IDO 1&2	IDO 3 &6	IDO 4	IDO 7	TARN. GORY	RYBNIK	MAZURY	WARMIA	BOAS
ISB				Yes					
LFH	Yes			Yes					
LLL	Yes	Yes		Yes					
MAL	Yes			Yes					
MCB	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MCC									
MCL	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MHB			Yes						
NAB	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
NAD		Yes							
NAH	Yes	Yes	Yes	Yes					
NAI									
NAL	Yes	Yes			Yes	Yes	Yes	Yes	
NFD	Yes			Yes					
NPH				Yes	Yes	Yes	Yes	Yes	
NSD	Yes								
NSH	Yes	Yes		Yes					
OEB		Yes		Yes					
PEB	Yes	Yes							
PUH	Yes	Yes		Yes	Yes	Yes			
RAH				Yes					
RSL									
SBD	Yes			Yes					
Sex	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SHB		Yes	Yes		Yes	Yes			
SHD	Yes	Yes		Yes					

Table A-2. (Continued)

CODE	IDO 1&2	IDO 3 &6	IDO 4	IDO 7	TARN. GORY	RYBNIK	MAZURY	WARMIA	BOAS
SIH	Yes	Yes	Yes						
SLH	Yes			Yes					
SPA	Yes	Yes							
STH		Yes			Yes	Yes			
SYH				Yes					
THH	Yes	Yes		Yes					
THL	Yes			Yes					
TIH				Yes					
TRL	Yes	Yes		Yes					
UFH	Yes								
ULH		Yes		Yes					
USH	Yes			Yes					
WFB	Yes	Yes	Yes	Yes			Yes		
WRC		Yes	Yes						
YOB	Yes	Yes	Yes	Yes			Yes	Yes	Yes
ZYB	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

APPENDIX C
Summary Tables

What follows is a summary of the data that was used in this analysis. Please refer to the following number codes as they designate the town, municipality, county or province that the data originate from. For definitions of the three letter anthropometric codes please refer to Table A- 1 in Appendix B.

Table A- 3. Key to Number Codes Used to Designate Provenience in Summary Data Tables

#	MUNICIPALITY	COUNTY	PROVINCE	DATA SOURCE
1		Tarnowskie Gory	Slask	Sikora, 1956
2		Rybnik	Slask	Stolyhwo et al., 1956
3		Mragowo	Warm-Mazur	Miszkiewicz, 1956
4		Gizycko	Warm-Mazur	Miszkiewicz, 1956
5		Elk	Warm-Mazur	Miszkiewicz, 1956
6		Olecko	Warm-Mazur	Miszkiewicz, 1956
7		Pisz	Warm-Mazur	Miszkiewicz, 1956
8		Wegorzewo	Warm-Mazur	Miszkiewicz, 1956
9		Ketrzyn	Warm-Mazur	Miszkiewicz, 1956
10		Olsztyn	Warm-Mazur	Miszkiewicz, 1956 & 1960
11		Szczytno	Warm-Mazur	Miszkiewicz, 1956 & 1960
12		Ostroda	Warm-Mazur	Miszkiewicz, 1956
13		Starograd Gdanski	Warm-Mazur	Miszkiewicz, 1956
14		Grudziadz	Warm-Mazur	Miszkiewicz, 1956
15		Malbock	Warm-Mazur	Miszkiewicz, 1956
16		Szczycienski	Warm-Mazur	Miszkiewicz, 1956
17		Lidzbark Warminski	Warm-Mazur	Miszkiewicz, 1960
18		Reszelski	Warm-Mazur	Miszkiewicz, 1960
19		Braniewski	Warm-Mazur	Miszkiewicz, 1960
20		Tucholski	Warm-Mazur	Miszkiewicz, 1960
21		Chojnicki	Warm-Mazur	Miszkiewicz, 1960
22		Swiecki	Warm-Mazur	Miszkiewicz, 1960
23		Rypinski	Warm-Mazur	Miszkiewicz, 1960
24		Bydgoski	Warm-Mazur	Miszkiewicz, 1960
100		Podhale Region		USHMM, 2008a
360	Krakow - Mixed	IDO 3 & 6 Pooled		USHMM, 2008a
400	Charkow - Town			USHMM, 2008a
701	Hanczowa - Town			USHMM, 2008a
702	Komancza - Town			USHMM, 2008a
703	Golkowtiz - Town			USHMM, 2008a
704	Alt Sandez - Town			USHMM, 2008a
705	Borowa - Town			USHMM, 2008a
706	Wawrzencyce - Town			USHMM, 2008a
1001	Bobrowniki	Tarnowskie Gory	Slask	Sikora, 1956
1002	Boruszowice	Tarnowskie Gory	Slask	Sikora, 1956
1003	Brynica	Tarnowskie Gory	Slask	Sikora, 1956
1004	Kozłowa Gora	Tarnowskie Gory	Slask	Sikora, 1956
1005	Lasowice	Tarnowskie Gory	Slask	Sikora, 1956
1006	Miasteczko	Tarnowskie Gory	Slask	Sikora, 1956
1007	Mikoleska	Tarnowskie Gory	Slask	Sikora, 1956
1008	Naklo	Tarnowskie Gory	Slask	Sikora, 1956
1009	Opatowice	Tarnowskie Gory	Slask	Sikora, 1956
1010	Orzech	Tarnowskie Gory	Slask	Sikora, 1956
1011	Piaseczna	Tarnowskie Gory	Slask	Sikora, 1956
1012	Piekary Rudne	Tarnowskie Gory	Slask	Sikora, 1956
1013	Pniowiec	Tarnowskie Gory	Slask	Sikora, 1956
1014	Radzionkow	Tarnowskie Gory	Slask	Sikora, 1956
1015	Repty Nowe	Tarnowskie Gory	Slask	Sikora, 1956

Table A-3. (Continued)

#	MUNICIPALITY	COUNTY	PROVINCE	DATA SOURCE
1016	Repty Stare	Tarnowskie Gory	Slask	Sikora, 1956
1017	Rybna	Tarnowskie Gory	Slask	Sikora, 1956
1018	Sowice	Tarnowskie Gory	Slask	Sikora, 1956
1019	Sucha Gora	Tarnowskie Gory	Slask	Sikora, 1956
1020	Swierklanice	Tarnowskie Gory	Slask	Sikora, 1956
1021	Tarnowice Stare	Tarnowskie Gory	Slask	Sikora, 1956
1022	Tarnowskie Gory	Tarnowskie Gory	Slask	Sikora, 1956
1023	Zyglin	Tarnowskie Gory	Slask	Sikora, 1956
1024	Zyglinek	Tarnowskie Gory	Slask	Sikora, 1956
2001	Adamowice	Rybnik	Slask	Stolyhwo et al., 1956
2002	Belk	Rybnik	Slask	Stolyhwo et al., 1956
2003	Belsznica	Rybnik	Slask	Stolyhwo et al., 1956
2004	Bluszczow	Rybnik	Slask	Stolyhwo et al., 1956
2005	Bogunice	Rybnik	Slask	Stolyhwo et al., 1956
2006	Boguszowice	Rybnik	Slask	Stolyhwo et al., 1956
2007	Brzezie	Rybnik	Slask	Stolyhwo et al., 1956
2008	Bujakow	Rybnik	Slask	Stolyhwo et al., 1956
2009	Bukow	Rybnik	Slask	Stolyhwo et al., 1956
2010	Chudow	Rybnik	Slask	Stolyhwo et al., 1956
2011	Chwalowice	Rybnik	Slask	Stolyhwo et al., 1956
2012	Chwalecice	Rybnik	Slask	Stolyhwo et al., 1956
2013	Czernica	Rybnik	Slask	Stolyhwo et al., 1956
2014	Czerwionka	Rybnik	Slask	Stolyhwo et al., 1956
2015	Czuchow	Rybnik	Slask	Stolyhwo et al., 1956
2016	Czyzowice	Rybnik	Slask	Stolyhwo et al., 1956
2017	Debienko	Rybnik	Slask	Stolyhwo et al., 1956
2018	Dzimierz	Rybnik	Slask	Stolyhwo et al., 1956
2019	Folwarki	Rybnik	Slask	Stolyhwo et al., 1956
2020	Gaszowice	Rybnik	Slask	Stolyhwo et al., 1956
2021	Tarnowice Stare	Rybnik	Slask	Stolyhwo et al., 1956
2022	Tarnowskie Gory	Rybnik	Slask	Stolyhwo et al., 1956
2023	Zyglin	Rybnik	Slask	Stolyhwo et al., 1956
2024	Golejow	Rybnik	Slask	Stolyhwo et al., 1956
2025	Gorzyce	Rybnik	Slask	Stolyhwo et al., 1956
2026	Gorzyczki	Rybnik	Slask	Stolyhwo et al., 1956
2027	Gotartowice	Rybnik	Slask	Stolyhwo et al., 1956
2028	Jankowice Rybnickie	Rybnik	Slask	Stolyhwo et al., 1956
2029	Jastrzebie Dolne	Rybnik	Slask	Stolyhwo et al., 1956
2030	Jastrzebie Gorne	Rybnik	Slask	Stolyhwo et al., 1956
2031	Jedlownik	Rybnik	Slask	Stolyhwo et al., 1956
2032	Jejkowice	Rybnik	Slask	Stolyhwo et al., 1956
2033	Kamien	Rybnik	Slask	Stolyhwo et al., 1956
2034	Kamien n. Odra	Rybnik	Slask	Stolyhwo et al., 1956
2035	Kleszczow	Rybnik	Slask	Stolyhwo et al., 1956
2036	Klokocin	Rybnik	Slask	Stolyhwo et al., 1956
2037	Knurow	Rybnik	Slask	Stolyhwo et al., 1956
2038	Kobyła	Rybnik	Slask	Stolyhwo et al., 1956
2039	Kokoszyce	Rybnik	Slask	Stolyhwo et al., 1956
2040	Kornowacz	Rybnik	Slask	Stolyhwo et al., 1956
2041	Krzyzkowice	Rybnik	Slask	Stolyhwo et al., 1956
2042	Ksiazenice	Rybnik	Slask	Stolyhwo et al., 1956
2043	Leszczyny	Rybnik	Slask	Stolyhwo et al., 1956
2044	Ligota Tworkowska	Rybnik	Slask	Stolyhwo et al., 1956
2045	Liski	Rybnik	Slask	Stolyhwo et al., 1956
2046	Lubomina	Rybnik	Slask	Stolyhwo et al., 1956
2047	Lance	Rybnik	Slask	Stolyhwo et al., 1956
2048	Laziska	Rybnik	Slask	Stolyhwo et al., 1956
2049	Lukow	Rybnik	Slask	Stolyhwo et al., 1956
2050	Marklowice Dolne	Rybnik	Slask	Stolyhwo et al., 1956

Table A-3. (Continued)

#	MUNICIPALITY	COUNTY	PROVINCE	DATA SOURCE
2051	Marklowice Gorny	Rybnik	Slask	Stolyhwo et al., 1956
2052	Moszczenica	Rybnik	Slask	Stolyhwo et al., 1956
2053	Mszana	Rybnik	Slask	Stolyhwo et al., 1956
2054	Niebochowy	Rybnik	Slask	Stolyhwo et al., 1956
2055	Niedobczyce	Rybnik	Slask	Stolyhwo et al., 1956
2056	Niewiadom	Rybnik	Slask	Stolyhwo et al., 1956
2057	Nowa Wies	Rybnik	Slask	Stolyhwo et al., 1956
2058	Ochojec	Rybnik	Slask	Stolyhwo et al., 1956
2059	Odra	Rybnik	Slask	Stolyhwo et al., 1956
2060	Olza	Rybnik	Slask	Stolyhwo et al., 1956
2061	Orzepowice	Rybnik	Slask	Stolyhwo et al., 1956
2062	Osiny	Rybnik	Slask	Stolyhwo et al., 1956
2063	Palowice	Rybnik	Slask	Stolyhwo et al., 1956
2064	Paniowki	Rybnik	Slask	Stolyhwo et al., 1956
2065	Pogrzebien	Rybnik	Slask	Stolyhwo et al., 1956
2066	Polomia	Rybnik	Slask	Stolyhwo et al., 1956
2067	Popielow	Rybnik	Slask	Stolyhwo et al., 1956
2068	Przegedza	Rybnik	Slask	Stolyhwo et al., 1956
2069	Przysowice	Rybnik	Slask	Stolyhwo et al., 1956
2070	Pstrazna	Rybnik	Slask	Stolyhwo et al., 1956
2071	Pszow	Rybnik	Slask	Stolyhwo et al., 1956
2072	Radlin	Rybnik	Slask	Stolyhwo et al., 1956
2073	Raszczyce	Rybnik	Slask	Stolyhwo et al., 1956
2074	Rogozna	Rybnik	Slask	Stolyhwo et al., 1956
2075	Rogow	Rybnik	Slask	Stolyhwo et al., 1956
2076	Rowien	Rybnik	Slask	Stolyhwo et al., 1956
2077	Roj	Rybnik	Slask	Stolyhwo et al., 1956
2078	Ruptawa	Rybnik	Slask	Stolyhwo et al., 1956
2079	Rybnik	Rybnik	Slask	Stolyhwo et al., 1956
2080	Rydultowy	Rybnik	Slask	Stolyhwo et al., 1956
2081	Rzuchow	Rybnik	Slask	Stolyhwo et al., 1956
2082	Skrbensko-Golkowice	Rybnik	Slask	Stolyhwo et al., 1956
2083	Skrzysow	Rybnik	Slask	Stolyhwo et al., 1956
2084	Stanowice	Rybnik	Slask	Stolyhwo et al., 1956
2085	Sumina	Rybnik	Slask	Stolyhwo et al., 1956
2086	Syrynia	Rybnik	Slask	Stolyhwo et al., 1956
2087	Szczyglowice	Rybnik	Slask	Stolyhwo et al., 1956
2088	Szczerbice	Rybnik	Slask	Stolyhwo et al., 1956
2089	Szczekowice	Rybnik	Slask	Stolyhwo et al., 1956
2090	Swierklany Dolne	Rybnik	Slask	Stolyhwo et al., 1956
2091	Swierklany Gorne	Rybnik	Slask	Stolyhwo et al., 1956
2092	Turza	Rybnik	Slask	Stolyhwo et al., 1956
2093	Uchylsko	Rybnik	Slask	Stolyhwo et al., 1956
2094	Wielopole	Rybnik	Slask	Stolyhwo et al., 1956
2095	Wilchwy	Rybnik	Slask	Stolyhwo et al., 1956
2096	Wilcza	Rybnik	Slask	Stolyhwo et al., 1956
2097	Wodzislaw	Rybnik	Slask	Stolyhwo et al., 1956
2098	Zawada	Rybnik	Slask	Stolyhwo et al., 1956
2099	Zebrzydowice	Rybnik	Slask	Stolyhwo et al., 1956
2100	Zwonowice	Rybnik	Slask	Stolyhwo et al., 1956
2101	Zory	Rybnik	Slask	Stolyhwo et al., 1956
2102	Zytna	Rybnik	Slask	Stolyhwo et al., 1956

Females

Table A- 4. Summary Statistics for Females from IDO Subseries 1 (USHMM, 2008a).

<i>ID</i>	<i>STAT</i>	<i>AGE</i>	<i>BIB</i>	<i>CEI</i>	<i>CRC</i>	<i>EAH</i>	<i>EHH</i>	<i>FAH</i>	<i>FLH</i>	<i>FML</i>	<i>FRL</i>	<i>GNH</i>	<i>HAL</i>	<i>HGT</i>	<i>ICB</i>
100	AVG	41.45	101.63	84.61	547.19	1436.71	124.87	107.00	579.17	112.34	421.97	1330.00	101.00	1525.44	878.00
	N	20	38	46	37	34	38	1	35	44	34	1	1	43	1
	MAX	72.00	108.00	93.22	570.00	1528.00	139.00	107.00	637.00	130.00	465.00	1330.00	101.00	1653.00	878.00
	MIN	20.00	91.00	76.77	521.00	1000.00	114.00	107.00	426.00	100.00	326.00	1330.00	101.00	1145.00	878.00
	STD	14.67	4.19	3.67	12.88	91.79	4.38	-	42.07	6.87	23.88	-	-!	110.10	-
	<i>STAT</i>	<i>ICH</i>	<i>IEB</i>	<i>LFH</i>	<i>LLL</i>	<i>MAL</i>	<i>MCB</i>	<i>MCL</i>	<i>NAB</i>	<i>NAH</i>	<i>NAL</i>	<i>NFD</i>	<i>NSH</i>	<i>PEB</i>	<i>PUH</i>
	AVG	899.00	34.18	37.00	691.00	657.00	152.85	180.83	34.41	50.00	50.82	19.00	70.00	296.85	721.00
	N	1	39	1	1	1	46	46	39	1	38	1	1	34	1
	MAX	899.00	83.00	37.00	691.00	657.00	166.00	198.00	41.00	50.00	60.00	19.00	70.00	340.00	721.00
	MIN	899.00	29.00	37.00	691.00	657.00	144.00	166.00	28.00	50.00	25.00	19.00	70.00	259.00	721.00
	STD	-	8.45	-	-	-	5.14	6.34	2.54	-	5.57	-	-	19.41	-
	<i>STAT</i>	<i>SBD</i>	<i>SHD</i>	<i>SIH</i>	<i>SLH</i>	<i>SPA</i>	<i>THH</i>	<i>THL</i>	<i>TRL</i>	<i>UFH</i>	<i>ULH</i>	<i>USH</i>	<i>WFB</i>	<i>YOB</i>	<i>ZYB</i>
	AVG	164.00	21.00	821.19	1279.31	1621.34	205.00	508.00	814.00	64.63	20.00	1268.23	101.95	1898.65	134.46
	N	1	1	36	35	35	1	1	1	35	1	35	38	20	46
	MAX	164.00	21.00	872.00	1370.00	1758.00	205.00	508.00	814.00	79.00	20.00	1355.00	117.00	1920.00	150.00
	MIN	164.00	21.00	667.00	870.00	1165.00	205.00	508.00	814.00	56.00	20.00	877.00	94.00	1868.00	118.00
	STD	-	-	48.39	83.80	109.87	-	-	-	4.39	-	81.04	4.43	14.80	6.34

Table A- 5. Summary Statistics For Females from IDO Subseries 3 & 6 (USHMM, 2008a)

<i>ID</i>	<i>STAT</i>	<i>ACH</i>	<i>AGE</i>	<i>ARL</i>	<i>BIB</i>	<i>CEI</i>	<i>CRH</i>	<i>DAH</i>	<i>DAH</i>	<i>EHH</i>	<i>ESP</i>	<i>FAH</i>	<i>FML</i>	<i>GNH</i>	<i>HAB</i>
360	AVG	1264.91	27.65	690.04	101.61	85.22	208.95	573.06	573.06	120.65	29.08	114.72	110.31	1339.30	77.33
	N	232	268	271	267	267	39	232	232	267	38	227	39	232	39
	MAX	1407.00	56.00	798.00	134.00	118.80	311.00	865.00	865.00	160.00	38.00	155.00	147.00	1490.00	90.00
	MIN	1122.00	18.00	366.00	91.00	76.06	176.00	475.00	475.00	107.00	23.00	97.00	102.00	1218.00	66.00
	STD	51.44	7.76	42.33	5.29	4.11	19.80	42.75	42.75	5.54	2.92	6.18	9.22	52.84	4.74
	<i>STAT</i>	<i>HAL</i>	<i>HGT</i>	<i>IEB</i>	<i>LLL</i>	<i>MCB</i>	<i>MCL</i>	<i>NAB</i>	<i>NAD</i>	<i>NAH</i>	<i>NAL</i>	<i>NSH</i>	<i>OEB</i>	<i>PEB</i>	<i>PUH</i>
	AVG	79.14	1556.95	32.75	703.38	150.96	177.39	32.26	18.88	51.30	47.37	72.50	88.36	268.00	797.59
	N	232	271	227	268	267	267	266	226	227	38	227	228	229	232
	MAX	149.00	1755.00	41.00	873.00	166.00	193.00	43.00	92.00	61.00	58.00	96.00	100.00	317.00	913.00
	MIN	48.00	1401.00	25.00	280.00	136.00	117.00	26.00	14.00	39.00	32.00	25.00	34.00	202.00	612.00
	STD	11.89	58.60	2.72	162.90	5.25	7.44	2.43	5.38	3.72	4.53	5.58	5.40	17.41	41.30
	<i>STAT</i>	<i>SHB</i>	<i>SHD</i>	<i>SIH</i>	<i>SPA</i>	<i>STH</i>	<i>THH</i>	<i>TRL</i>	<i>ULH</i>	<i>WFB</i>	<i>WRC</i>	<i>YOB</i>	<i>ZYB</i>		
	AVG	355.23	13.21	832.51	1639.95	1260.10	214.17	532.47	21.64	105.62	152.97	1914.10	133.27		
	N	269	231	37	38	232	232	232	226	267	39	268	267		
	MAX	403.00	82.00	912.00	1850.00	1403.00	305.00	611.00	55.00	702.00	185.00	1924.00	196.00		
	MIN	301.00	1.00	763.00	1500.00	1128.00	155.00	434.00	10.00	90.00	140.00	1886.00	100.00		
	STD	17.00	11.09	34.94	80.87	49.03	16.16	26.74	4.64	36.99	9.86	7.96	7.44		

Table A- 6. Summary Statistics for Females form IDO 4 (USHMM, 2008a).

ID	STAT	AGE	BIB	CEI	CRC	ESP	FAH	HAB	HAL	CRH	HGT	MCB
400	AVG	32.64	101.67	87.09	541.32	31.83	112.90	77.89	172.81	214.99	1549.64	153.73
	N	74	73	73	73	72	72	73	73	73	73	73
	MAX	57.00	110.00	95.74	595.00	40.00	131.00	89.00	190.00	895.00	1688.00	180.00
	MIN	18.00	92.00	77.13	455.00	27.00	100.00	44.00	143.00	183.00	1378.00	142.00
	STD	8.68	4.18	3.52	19.82	2.88	6.45	5.69	9.12	81.11	57.90	6.07
	STAT	MCL	MHB	NAB	NAH	SHB	SIH	WFB	WRC	YOB	ZYB	
	AVG	176.63	312.32	33.19	49.29	355.44	829.30	106.23	149.93	1909.36	135.34	
	N	73	73	72	72	73	73	73	71	74	73	
	MAX	192.00	345.00	84.00	61.00	645.00	913.00	120.00	165.00	1924.00	150.00	
	MIN	165.00	215.00	21.00	40.00	245.00	496.00	97.00	135.00	1885.00	127.00	
	STD	6.45	19.14	6.80	4.07	52.61	51.08	4.10	6.29	8.68	4.57	

Table A- 7. Summary Statistics for Females from IDO 7 (USHMM, 2008a). Table 1 of 2.

ID	STAT	AGE	BIB	CEI	EHH	FAH	FLH	GNH	HAL	HGT	ICB	ICH	IEB	ISB	LFH	LLL	MAL	MCB	MCL	NAB	NAH	NFD
701	AVG	34.67	100.70	88.18	120.31	113.88	553.06	1318.17	74.66	1634.44	277.14	925.26	31.15	250.50	40.67	732.27	694.47	150.28	172.83	32.37	51.71	22.72
	N	126	127	127	124	126	126	122	126	124	124	127	2	120	120	121	123	126	127	127	127	127
	MAX	57.00	114.00	205.63	180.00	132.00	713.00	1456.00	104.00	15226.00	884.00	1063.00	39.00	267.00	51.00	838.00	787.00	172.00	192.00	38.00	62.00	33.00
	MIN	20.00	87.00	31.22	108.00	101.00	469.00	1154.00	53.00	1359.00	231.00	760.00	25.00	234.00	28.00	620.00	600.00	117.00	71.00	27.00	41.00	16.00
	STD	7.69	4.84	17.64	9.12	6.65	36.60	56.91	10.87	1222.01	65.10	46.86	2.57	23.33	4.24	37.84	34.70	6.40	17.99	2.22	3.70	3.56
702	AVG	36.10	101.19	84.67	120.55	116.84	580.81	1344.39	73.34	1554.14	288.00	941.13	32.98		43.94	743.14	696.48	151.33	177.08	32.27	50.05	19.75
	N	167	166	163	165	165	167	166	164	166	166	163	166		164	167	167	165	166	166	166	164
	MAX	51.00	118.00	98.33	174.00	140.00	669.00	1532.00	104.00	1760.00	890.00	1073.00	53.00		64.00	853.00	814.00	177.00	198.00	41.00	59.00	30.00
	MIN	20.00	90.00	73.45	105.00	100.00	429.00	1218.00	38.00	1424.00	212.00	849.00	21.00		34.00	664.00	591.00	130.00	108.00	21.00	31.00	15.00
	STD	7.91	4.88	5420.31	6.50	7.02	32.35	49.79	12.40	54.29	68.18	37.01	2.81		4.28	32.67	35.23	5.79	11.64	2.45	4.42	2.57
703	AVG	37.86	103.49	87.04	121.35	117.71	572.53	1321.19	72.44	1533.47	292.33	916.43	32.46		43.31	715.86	677.33	154.38	177.68	33.18	52.57	20.79
	N	101	101	102	102	102	102	103	103	103	103	102	102		101	103	102	102	102	102	102	102
	MAX	80.00	199.00	122.83	134.00	133.00	683.00	1487.00	123.00	1694.00	335.00	1071.00	39.00		92.00	811.00	771.00	167.00	192.00	42.00	63.00	27.00
	MIN	18.00	93.00	77.90	108.00	102.00	455.00	1028.00	21.00	1238.00	246.00	631.00	23.00		34.00	487.00	508.00	141.00	127.00	22.00	40.00	12.00
	STD	15.66	10.52	4.94	4.97	5.63	41.97	72.09	15.59	77.06	18.38	71.27	2.34		6.31	50.77	45.01	5.38	6.92	2.74	4.18	2.48
704	AVG	35.19	102.39	86.21	121.68	116.23	588.04	1358.11		1567.87	290.34	941.83	32.49					152.67	177.50	33.29	51.90	20.94
	N	234	233	234	230	234	233	233		233	229	231	234					234	234	234	234	233
	MAX	51.00	123.00	122.13	179.00	155.00	894.00	1525.00		1748.00	350.00	1081.00	83.00					167.00	192.00	52.00	64.00	30.00
	MIN	18.00	67.00	65.12	108.00	81.00	420.00	1139.00		1338.00	238.00	779.00	24.00					104.00	122.00	22.00	31.00	16.00
	STD	7.19	5.60	5.58	6.06	7.27	43.90	59.79		63.87	19.44	49.01	4.00					6.58	8.86	3.08	4.89	2.43
705	AVG	38.62	103.95	85.54	120.21	118.10	591.03	1343.61	65.37	1552.05	299.86	943.62	32.72		43.74	761.87	699.28	152.67	178.90	33.05	52.94	20.10
	N	211	204	210	203	204	204	204	163	209	206	194	205		167	164	164	210	210	205	205	205
	MAX	75.00	167.00	150.48	135.00	138.00	940.00	1539.00	92.00	1770.00	608.00	1156.00	43.00		113.00	909.00	911.00	197.00	198.00	52.00	65.00	32.00
	MIN	18.00	90.00	63.44	107.00	96.00	437.00	1181.00	22.00	1376.00	207.00	665.00	21.00		32.00	457.00	418.00	118.00	105.00	23.00	33.00	13.00
	STD	13.70	6.56	6.10	4.67	7.26	70.88	55.72	12.78	62.10	30.17	53.88	2.49		7.57	46.60	46.11	6.21	7.95	2.81	4.93	2.36
706	AVG	34.44	103.61	90.14	121.67	118.11	570.29	1333.95	70.47	1546.46	295.59	931.54	32.44		43.10	738.82	699.59	152.89	178.09	32.80	52.34	22.02
	N	178	179	179	179	179	177	178	179	178	178	178	179		178	178	177	178	179	179	177	179
	MAX	57.00	167.00	833.91	134.00	130.00	643.00	1492.00	105.00	1711.00	372.00	1294.00	42.00		93.00	867.00	789.00	194.00	202.00	85.00	66.00	33.00
	MIN	19.00	80.00	63.13	109.00	102.00	435.00	1181.00	35.00	1395.00	264.00	609.00	26.00		34.00	658.00	562.00	113.00	131.00	10.00	37.00	17.00
	STD	9.37	6.99	56.15	4.66	4.96	33.46	49.74	12.83	52.49	14.71	52.28	2.34		5.44	29.41	33.43	7.35	6.76	4.88	3.99	2.03
Total	AVG	36.12	102.62	85.65	120.99	116.90	578.40	1339.92	70.95	1563.39	291.41	935.54	32.44	250.50	43.06	740.65	694.86	152.37	177.26	32.86	51.93	20.98
	N	1017	1010	997	1006	1008	1009	1010	731	1015	1006	992	1013	2	730	733	733	1015	1018	1013	1011	1010
	MAX	80.00	199.00	85.40	180.00	155.00	940.00	1539.00	123.00	15226.00	890.00	1294.00	83.00	267.00	113.00	909.00	911.00	197.00	202.00	85.00	66.00	33.00
	MIN	18.00	67.00	31.22	105.00	81.00	420.00	1028.00	21.00	1238.00	207.00	609.00	21.00	234.00	28.00	457.00	418.00	104.00	71.00	10.00	31.00	12.00
	STD	10.49	6.61	3.36	6.07	6.76	48.12	58.28	13.23	433.80	40.87	52.02	2.97	23.33	5.83	41.59	39.46	6.47	10.44	3.23	4.55	2.73

Table A- 8. Summary Statistics for Females from IDO 7 (USHMM, 2008a). Table 2 of 2.

ID	STAT	NPH	NSH	OEB	PUH	RAH	SBD	SHB	SHD	SLH	SYH	THH	THL	TIH	TRL	ULH	USH	WFB	YOB	ZYB
701	AVG	71.17	72.65	87.42	760.33	1007.50	181.80	351.90	10.50	1247.17	770.00	208.01	486.25	456.00	758.27	21.28	1235.20	104.05	1907.33	132.51
	N	6	124	126	123	2	124	123	116	126	2	124	122	2	122	120	126	127	126	127
	MAX	78.00	86.00	104.00	898.00	1043.00	225.00	402.00	36.00	1409.00	804.00	241.00	799.00	498.00	838.00	32.00	1379.00	119.00	1922.00	189.00
	MIN	64.00	24.00	78.00	640.00	972.00	146.00	229.00	1.00	1072.00	736.00	187.00	388.00	414.00	138.00	14.00	122.00	92.00	1885.00	117.00
	STD	4.75	6.21	4.22	42.13	50.20	12.24	21.30	7.49	57.35	48.08	9.96	42.26	59.40	72.52	3.14	113.44	5.02	7.69	7.21
702	AVG	75.00	73.31	87.82	770.74		194.72	358.04	14.72	1280.40		210.05	503.20		783.61	22.73	1277.57	104.28	1906.53	136.95
	N	1	166	165	167		165	165	163	167		167	166		166	164	167	166	167	166
	MAX	75.00	125.00	97.00	903.00		293.00	645.00	91.00	1856.00		282.00	608.00		882.00	34.00	1835.00	115.00	1922.00	740.00
	MIN	75.00	62.00	79.00	684.00		159.00	250.00	1.00	1142.00		181.00	440.00		720.00	14.00	1156.00	96.00	1892.00	102.00
	STD	-	6.52	3.77	35.97		16.93	33.79	12.66	68.35		12.22	31.78		32.52	2.95	69.29	3.88	7.79	47.60
703	AVG		74.28	86.11	742.97		185.47	358.45	14.55	1250.25		212.29	505.76		790.47	22.31	1249.69	103.14	1904.14	134.24
	N		101	102	103		103	103	100	103		103	103		103	101	103	102	101	102
	MAX		86.00	94.00	851.00		231.00	632.00	76.00	1419.00		246.00	632.00		902.00	29.00	1575.00	112.00	1924.00	147.00
	MIN		20.00	25.00	502.00		153.00	269.00	0.00	974.00		187.00	441.00		705.00	15.00	864.00	93.00	1862.00	120.00
	STD		7.11	6.80	55.32		15.49	33.55	12.55	74.99		11.26	31.72		36.47	3.07	80.75	3.63	15.66	4.65
704	AVG		74.44	89.24	791.45		186.00	355.71		1285.85		120.00					1331.52	105.17	1906.81	134.92
	N		234	233	233		232	232		233		1					233	233	234	234
	MAX		97.00	101.00	974.00		371.00	407.00		1445.00		120.00					11343.00	128.00	1924.00	178.00
	MIN		51.00	79.00	653.00		144.00	287.00		1062.00		120.00					1078.00	94.00	1891.00	99.00
	STD		5.98	4.09	45.83		21.09	18.42		57.46		-					663.08	4.56	7.19	6.64
705	AVG		75.87	88.64	791.04	963.46	190.42	359.80	14.58	1279.34	738.25	210.89	489.40	423.32	768.01	22.95	1272.05	105.08	1903.37	134.99
	N		205	205	201	154	208	207	152	202	153	166	164	150	164	167	204	205	211	205
	MAX		91.00	99.00	953.00	1146.00	500.00	900.00	54.00	1542.00	823.00	261.00	771.00	586.00	989.00	32.00	1493.00	199.00	1924.00	149.00
	MIN		53.00	79.00	662.00	716.00	152.00	190.00	1.00	1023.00	554.00	170.00	374.00	309.00	454.00	10.00	726.00	93.00	1867.00	120.00
	STD		5.97	4.24	41.34	68.75	27.92	47.75	10.42	64.06	46.18	13.27	39.06	30.53	55.39	3.61	75.25	7.96	13.72	4.70
706	AVG		75.54	88.63	764.55		190.37	357.64		1267.15		211.53	497.41		780.28	22.90	1251.74	105.23	1907.56	134.63
	N		178	178	177		178	178		178		179	179		179	175	178	179	178	179
	MAX		95.00	104.00	907.00		789.00	396.00		1416.00		235.00	681.00		890.00	34.00	1417.00	194.00	1923.00	172.00
	MIN		63.00	80.00	557.00		112.00	237.00		1011.00		184.00	399.00		668.00	13.00	122.00	93.00	1885.00	122.00
	STD		4.38	3.58	35.31		47.44	16.50		52.23		9.54	30.16		34.09	3.18	124.40	10.26	9.37	5.25
Total	AVG	71.71	74.50	88.24	774.40	964.03	188.53	357.09	13.73	1271.88	738.66	210.44	496.25	423.75	776.06	22.52	1276.22	104.67	1905.98	134.84
	N	7	1008	1009	1004	156	1010	1008	531	1009	155	740	734	152	734	727	1011	1012	1017	1013
	MAX	78.00	125.00	104.00	974.00	1146.00	789.00	900.00	91.00	1856.00	823.00	282.00	799.00	586.00	989.00	34.00	11343.00	199.00	1924.00	740.00
	MIN	64.00	20.00	25.00	502.00	716.00	112.00	190.00	0.00	974.00	554.00	120.00	374.00	309.00	138.00	10.00	122.00	92.00	1862.00	99.00
	STD	4.57	6.07	4.44	45.33	68.61	27.59	30.87	11.16	63.24	46.18	11.91	35.69	30.93	48.68	3.26	330.12	6.59	10.49	19.97

Table A- 9. Summary Statistics for Females from Tarnowskie Gory (Sikora, 1956).

ID	STAT	ACH	AGE	CEI	DAH	FAH	HGT	ICB	MCB	MCL	NAB	NAL	NPH	PUH	SHB	STH	ZYB
1001	AVG	1265.28	30.26	85.65	587.53	110.14	1551.44	289.00	152.72	178.42	30.88	47.48	63.18	798.91	336.04	1263.66	132.86
	N	50	50	50	49	50	50	48	50	50	50	50	50	22	50	50	50
	MAX	1350.00	46.00	92.40	658.00	120.00	1652.00	330.00	170.00	191.00	36.00	58.00	71.00	840.00	387.00	1343.00	147.00
	MIN	1162.00	20.00	76.96	512.00	101.00	1451.00	219.00	140.00	170.00	28.00	41.00	52.00	728.00	303.00	1183.00	125.00
	STD	46.09	6.22	3.20	32.23	5.37	49.73	18.69	5.05	5.62	1.99	3.07	4.23	29.91	16.90	43.49	4.65
1002	AVG	1279.07	30.89	86.15	592.02	108.43	1558.48	294.70	153.73	178.59	32.70	48.48	62.98	794.64	337.93	1271.09	132.57
	N	44	44	44	44	44	44	43	44	44	44	44	44	33	44	44	44
	MAX	1411.00	50.00	98.31	654.00	122.00	1691.00	337.00	175.00	190.00	37.00	61.00	71.00	883.00	378.00	1376.00	141.00
	MIN	1190.00	22.00	78.31	547.00	98.00	1453.00	262.00	141.00	165.00	29.00	42.00	53.00	724.00	302.00	1170.00	124.00
	STD	50.05	7.45	3.55	28.18	5.35	54.01	16.52	5.33	6.20	2.11	3.42	3.66	39.23	15.41	47.28	4.29
1003	AVG	1261.61	35.08	86.12	576.22	108.44	1542.19	287.97	153.33	178.14	32.31	48.97	63.58	796.26	338.47	1256.44	131.86
	N	36	36	36	36	36	36	36	36	36	36	36	36	19	36	36	36
	MAX	1335.00	50.00	94.12	640.00	124.00	1651.00	334.00	165.00	191.00	38.00	56.00	73.00	851.00	371.00	1346.00	141.00
	MIN	1185.00	20.00	80.65	515.00	96.00	1458.00	263.00	142.00	170.00	27.00	44.00	56.00	753.00	305.00	1180.00	120.00
	STD	42.58	8.82	3.16	28.33	6.21	51.61	16.15	5.38	5.38	2.46	2.99	4.18	29.73	14.69	45.91	5.72
1004	AVG	1259.69	34.41	86.34	579.39	110.82	1544.08	282.32	152.27	176.55	31.33	49.37	64.39	795.23	329.92	1252.33	133.29
	N	51	51	51	51	51	51	37	51	51	51	51	51	26	51	51	51
	MAX	1356.00	48.00	96.97	658.00	123.00	1646.00	323.00	165.00	190.00	37.00	55.00	72.00	861.00	383.00	1335.00	150.00
	MIN	1120.00	22.00	77.90	530.00	99.00	1460.00	247.00	141.00	165.00	27.00	44.00	57.00	750.00	301.00	1175.00	125.00
	STD	41.66	5.79	3.61	27.39	4.87	47.49	17.55	4.06	6.07	1.97	2.62	3.58	31.40	19.48	41.40	4.56
1005	AVG	1268.80	31.28	84.89	584.98	110.98	1553.30	284.36	151.76	178.90	32.10	50.50	64.12	796.76	332.70	1263.74	131.66
	N	50	50	50	50	50	50	47	50	50	50	50	50	33	50	50	50
	MAX	1412.00	45.00	92.86	677.00	126.00	1704.00	312.00	169.00	191.00	37.00	55.00	73.00	875.00	365.00	1400.00	142.00
	MIN	1137.00	19.00	78.95	516.00	102.00	1406.00	250.00	141.00	165.00	25.00	44.00	54.00	723.00	293.00	1128.00	122.00
	STD	57.50	6.59	3.43	36.14	5.72	63.06	13.99	5.28	6.00	2.31	2.69	4.30	36.68	16.84	55.69	4.68
1006	AVG	1263.02	29.91	85.71	577.95	110.09	1547.89	284.86	153.70	179.48	31.80	47.52	62.77	791.00	334.30	1260.27	133.20
	N	44	44	44	44	44	44	44	44	44	44	44	44	35	44	44	44
	MAX	1376.00	43.00	93.57	660.00	125.00	1667.00	345.00	165.00	190.00	36.00	54.00	73.00	883.00	371.00	1353.00	144.00
	MIN	1167.00	20.00	77.72	530.00	97.00	1452.00	257.00	143.00	161.00	28.00	40.00	54.00	690.00	303.00	1172.00	120.00
	STD	46.28	6.90	3.43	27.31	6.65	50.43	17.51	5.32	6.48	1.94	3.11	3.88	39.70	17.66	43.35	4.36
1007	AVG	1262.33	31.85	84.80	575.30	110.00	1545.38	286.88	151.25	178.48	33.20	51.05	64.20	804.80	338.05	1260.03	131.23
	N	40	40	40	40	40	40	40	40	40	40	40	40	25	40	40	40
	MAX	1340.00	46.00	93.17	644.00	123.00	1667.00	314.00	159.00	188.00	40.00	61.00	76.00	878.00	393.00	1382.00	140.00
	MIN	1181.00	20.00	78.49	524.00	100.00	1460.00	257.00	140.00	161.00	26.00	45.00	56.00	755.00	303.00	1178.00	123.00
	STD	42.52	6.51	2.88	27.50	5.57	48.95	13.84	4.27	5.19	2.71	3.82	4.30	34.84	21.39	44.83	3.89
1008	AVG	1256.24	30.02	84.97	578.82	111.44	1539.56	276.55	151.76	178.74	31.78	48.00	63.10	783.66	335.10	1252.70	133.04
	N	50	50	50	50	50	50	44	50	50	50	50	50	32	50	50	50
	MAX	1381.00	48.00	92.49	662.00	127.00	1660.00	322.00	163.00	195.00	36.00	52.00	72.00	881.00	371.00	1361.00	141.00
	MIN	1135.00	20.00	78.46	496.00	100.00	1417.00	240.00	141.00	163.00	27.00	40.00	55.00	685.00	312.00	1145.00	123.00
	STD	51.43	6.99	3.04	32.61	5.28	53.60	21.21	5.05	6.72	1.90	2.83	3.30	41.01	13.47	48.09	4.39
1009	AVG	1252.87	33.94	84.69	569.29	108.48	1540.32	288.00	152.19	179.84	31.87	49.87	63.97	783.61	338.26	1246.68	132.06
	N	31	31	31	31	31	31	31	31	31	31	31	31	23	31	31	31
	MAX	1380.00	49.00	89.14	631.00	116.00	1683.00	312.00	161.00	191.00	34.00	56.00	72.00	857.00	367.00	1370.00	141.00
	MIN	1180.00	21.00	75.68	500.00	99.00	1450.00	257.00	140.00	165.00	28.00	42.00	55.00	725.00	305.00	1177.00	123.00
	STD	51.07	7.37	2.99	31.28	4.70	59.18	14.25	4.94	6.37	1.52	3.08	4.02	31.36	14.76	48.63	4.69
1010	AVG	1245.87	31.07	85.70	567.33	111.27	1537.47	280.15	153.27	178.91	32.00	49.47	63.82	770.78	329.58	1243.58	132.36
	N	45	45	45	45	45	45	41	45	45	45	45	45	32	45	45	45
	MAX	1356.00	45.00	91.81	644.00	129.00	1660.00	312.00	163.00	190.00	39.00	55.00	72.00	872.00	365.00	1364.00	149.00
	MIN	1112.00	19.00	79.57	498.00	97.00	1384.00	247.00	140.00	171.00	27.00	44.00	56.00	682.00	302.00	1111.00	120.00
	STD	53.62	7.48	2.65	34.09	5.93	56.40	16.20	4.58	5.25	2.52	2.27	3.94	39.75	18.33	50.20	5.84
1011	AVG	1263.24	33.52	85.44	583.36	112.64	1551.79	290.81	153.27	179.45	32.21	48.39	64.48	793.00	336.52	1262.00	133.15
	N	33	33	33	33	33	33	32	33	33	33	33	33	23	33	33	33
	MAX	1381.00	45.00	91.43	655.00	131.00	1681.00	330.00	165.00	191.00	35.00	54.00	70.00	894.00	380.00	1380.00	140.00
	MIN	1171.00	20.00	79.89	516.00	101.00	1456.00	254.00	147.00	171.00	27.00	43.00	60.00	688.00	305.00	1175.00	123.00

Table A-9. (Continued)

ID	STAT	ACH	AGE	CEI	DAH	FAH	HGT	ICB	MCB	MCL	NAB	NAL	NPH	PUH	SHB	STH	ZYB
	STD	54.91	6.14	2.81	34.73	5.52	57.98	15.63	4.65	4.27	1.75	2.61	2.86	45.04	17.00	53.71	4.66
1012	AVG	1259.04	32.29	86.09	572.53	108.75	1544.09	279.51	152.20	176.91	31.29	48.55	62.15	789.13	331.13	1256.87	131.75
	N	55	55	55	55	55	55	55	55	55	55	55	55	32	55	55	55
	MAX	1366.00	48.00	91.81	661.00	117.00	1665.00	320.00	160.00	190.00	36.00	55.00	70.00	860.00	363.00	1353.00	143.00
	MIN	1155.00	20.00	75.40	494.00	98.00	1434.00	230.00	141.00	167.00	27.00	40.00	55.00	706.00	291.00	1157.00	121.00
	STD	47.78	7.39	2.99	32.57	4.50	52.47	18.19	4.06	5.06	1.71	3.57	3.59	36.59	15.01	45.83	4.44
1013	AVG	1250.84	32.30	86.61	575.86	107.51	1536.14	282.33	152.53	176.28	32.56	48.16	63.14	786.07	331.72	1253.33	130.77
	N	43	43	43	43	43	43	42	43	43	43	43	43	30	43	43	43
	MAX	1371.00	45.00	96.27	654.00	121.00	1653.00	321.00	161.00	191.00	37.00	57.00	74.00	900.00	362.00	1363.00	143.00
	MIN	1127.00	21.00	81.08	514.00	95.00	1423.00	231.00	145.00	161.00	27.00	43.00	54.00	735.00	303.00	1143.00	120.00
	STD	51.62	6.53	3.31	30.24	6.29	52.85	18.59	4.22	5.87	2.22	3.01	4.71	35.65	13.98	48.23	4.28
1014	AVG	1263.45	31.04	86.59	585.09	107.34	1553.70	280.97	152.72	176.51	32.09	51.17	62.60	793.12	331.94	1264.04	133.51
	N	47	47	47	47	47	47	39	47	47	47	47	47	33	47	47	47
	MAX	1347.00	56.00	93.79	653.00	123.00	1654.00	312.00	165.00	187.00	43.00	57.00	70.00	887.00	371.00	1345.00	142.00
	MIN	1175.00	18.00	80.11	527.00	98.00	1451.00	230.00	141.00	161.00	27.00	46.00	55.00	721.00	301.00	1175.00	117.00
	STD	48.23	10.21	3.19	29.36	5.52	53.19	21.17	4.55	5.64	2.66	2.42	3.41	37.32	15.67	45.50	5.08
1015	AVG	1251.27	35.35	85.29	578.81	110.05	1537.89	283.84	151.59	177.86	32.11	46.81	62.78	789.76	330.08	1251.51	131.92
	N	37	37	37	37	37	37	37	37	37	37	37	37	25	37	37	37
	MAX	1340.00	49.00	94.15	654.00	122.00	1647.00	330.00	161.00	190.00	37.00	53.00	71.00	847.00	367.00	1345.00	146.00
	MIN	1106.00	24.00	78.69	432.00	98.00	1425.00	251.00	141.00	165.00	30.00	42.00	54.00	730.00	300.00	1107.00	125.00
	STD	51.33	6.72	3.20	37.69	5.24	52.06	20.32	4.49	5.66	2.11	2.62	3.58	33.45	16.97	51.71	4.32
1016	AVG	1254.74	32.77	86.46	579.86	107.37	1537.42	283.59	152.77	176.74	32.35	49.84	62.23	787.27	328.26	1251.77	131.51
	N	43	43	43	43	43	43	39	43	43	43	43	43	22	43	43	43
	MAX	1330.00	49.00	92.94	663.00	125.00	1637.00	304.00	167.00	187.00	42.00	56.00	72.00	846.00	370.00	1307.00	141.00
	MIN	1144.00	20.00	80.56	522.00	100.00	1416.00	249.00	141.00	162.00	26.00	44.00	56.00	722.00	293.00	1160.00	123.00
	STD	43.01	8.11	3.01	33.63	5.53	44.69	11.81	5.96	5.12	2.72	2.94	3.15	30.89	18.32	40.25	4.83
1017	AVG	1258.86	35.75	85.85	575.59	111.10	1547.00	287.79	152.90	178.22	31.75	50.51	63.94	796.56	329.53	1258.92	131.82
	N	51	51	51	51	51	51	48	51	51	51	51	51	27	51	51	51
	MAX	1401.00	49.00	92.55	662.00	123.00	1701.00	340.00	163.00	195.00	37.00	56.00	73.00	870.00	364.00	1387.00	144.00
	MIN	1160.00	21.00	78.26	492.00	100.00	1444.00	247.00	143.00	161.00	27.00	41.00	54.00	687.00	300.00	1170.00	123.00
	STD	50.13	7.65	2.87	35.35	5.07	52.73	18.78	4.23	5.50	2.42	3.35	4.12	43.03	13.82	46.37	4.90
1018	AVG	1262.64	33.67	85.97	579.05	108.88	1541.10	284.58	152.05	176.95	32.07	48.43	63.67	780.16	333.88	1257.50	131.90
	N	42	42	42	42	42	42	40	42	42	42	42	42	25	42	42	42
	MAX	1448.00	50.00	94.01	680.00	124.00	1720.00	324.00	160.00	187.00	38.00	54.00	73.00	847.00	372.00	1430.00	145.00
	MIN	1124.00	20.00	80.21	468.00	97.00	1421.00	253.00	143.00	165.00	27.00	41.00	52.00	695.00	300.00	1150.00	120.00
	STD	62.00	8.52	2.79	39.55	6.06	59.82	17.13	4.05	5.03	2.37	3.15	4.67	40.53	17.96	55.45	5.19
1019	AVG	1249.34	33.15	85.14	576.23	109.64	1538.06	284.63	151.79	178.38	31.51	50.87	62.23	801.15	329.60	1247.72	131.94
	N	47	47	47	47	47	47	43	47	47	47	47	47	13	47	47	47
	MAX	1378.00	50.00	93.22	645.00	122.00	1700.00	330.00	165.00	190.00	37.00	57.00	70.00	873.00	362.00	1377.00	142.00
	MIN	1162.00	20.00	78.42	522.00	95.00	1445.00	230.00	140.00	167.00	27.00	42.00	55.00	695.00	287.00	1174.00	121.00
	STD	43.86	7.11	3.19	30.03	5.77	48.82	23.30	5.24	5.56	2.28	2.92	3.74	51.72	17.45	42.20	5.18
1020	AVG	1245.06	32.82	85.98	571.96	110.49	1528.39	279.60	151.35	176.14	31.27	48.76	63.53	776.77	334.10	1239.27	132.47
	N	51	51	51	51	51	51	42	51	51	51	51	51	31	51	51	51
	MAX	1366.00	54.00	92.02	651.00	118.00	1657.00	312.00	160.00	185.00	36.00	57.00	70.00	853.00	374.00	1368.00	141.00
	MIN	1170.00	19.00	81.08	464.00	100.00	1428.00	250.00	143.00	163.00	20.00	43.00	57.00	735.00	303.00	1144.00	121.00
	STD	42.95	8.59	2.61	30.82	4.61	47.88	15.28	3.12	4.62	2.49	2.68	3.79	30.85	16.21	44.85	4.19
1024	AVG	1273.26	33.19	85.41	588.00	108.86	1556.60	295.37	152.58	178.77	31.95	47.65	62.86	812.70	336.21	1265.16	130.65
	N	43	43	43	43	43	43	41	43	43	43	43	43	27	43	43	43
	MAX	1381.00	47.00	92.07	660.00	119.00	1684.00	322.00	161.00	190.00	37.00	56.00	70.00	895.00	373.00	1380.00	141.00
	MIN	1162.00	23.00	77.90	496.00	93.00	1422.00	223.00	141.00	164.00	27.00	40.00	54.00	734.00	300.00	1151.00	117.00
	STD	48.32	6.59	2.87	35.14	5.49	54.51	19.31	4.46	6.07	2.33	3.20	4.23	34.82	17.02	45.36	5.51
TOTAL	AVG	1259.36	32.52	85.73	578.87	109.68	1544.41	285.04	152.45	177.95	31.92	49.06	63.29	790.89	333.28	1256.13	132.18
	COUNT	933.00	933.00	933.00	933.00	933.00	933.00	861.00	933.00	933.00	933.00	933.00	933.00	567.00	933.00	933.00	933.00
	MAX	1448.00	56.00	98.31	680.00	131.00	1720.00	345.00	175.00	195.00	43.00	61.00	76.00	900.00	393.00	1430.00	150.00
	MIN	1106.00	18.00	75.40	432.00	93.00	1384.00	219.00	140.00	161.00	20.00	40.00	52.00	682.00	287.00	1107.00	117.00
	STD	49.25	7.51	3.12	32.49	5.61	52.92	18.13	4.71	5.69	2.28	3.21	3.92	37.58	16.80	47.20	4.78

Table A- 10. Summary Statistics for Females from the County of Rybnik (Stołyhwo et al., 1956).

ID	STAT	ACH	AGE	CEI	DAH	FAH	HGT	ICB	MCB	MCL	NAB	NAL	NPH	PUH	SHB	STH	ZYB
2002	AVG	1260.96	33.72	85.79	582.47	111.89	1545.28	294.82	150.68	175.79	31.05	48.61	65.74	788.79	345.14	1258.23	131.68
	N	57	57	57	57	57	56	57	57	57	57	57	57	43	57	57	57
	MAX	1338.00	49.00	94.01	672.00	128.00	1641.00	340.00	161.00	190.00	36.00	60.00	76.00	847.00	397.00	1332.00	144.00
	MIN	1122.00	20.00	78.42	504.00	99.00	1392.00	260.00	143.00	162.00	21.00	41.00	55.00	684.00	307.00	1117.00	120.00
	STD	42.73	7.75	3.06	28.46	6.43	47.42	17.53	3.94	5.73	2.34	3.44	3.72	36.52	17.65	41.58	5.70
2003	AVG	1271.61	34.61	86.07	575.54	111.96	1560.48	291.98	153.87	178.89	33.48	47.61	63.70	798.85	345.11	1268.93	132.48
	N	46	46	46	46	46	46	46	46	46	46	46	46	33	46	46	46
	MAX	1351.00	49.00	91.33	648.00	125.00	1640.00	333.00	163.00	191.00	40.00	53.00	70.00	868.00	397.00	1337.00	142.00
	MIN	1180.00	20.00	79.06	527.00	98.00	1447.00	222.00	143.00	161.00	30.00	38.00	55.00	706.00	301.00	1181.00	121.00
	STD	42.47	7.81	2.65	27.32	5.50	45.66	23.87	4.81	6.50	2.69	3.32	3.83	38.52	20.31	39.55	4.70
2004	AVG	1269.03	32.45	86.32	573.43	111.63	1556.58	291.18	153.05	177.40	32.35	47.98	63.85	792.29	341.63	1264.25	132.43
	N	40	40	40	40	40	40	38	40	40	40	40	40	28	40	40	40
	MAX	1380.00	50.00	91.62	626.00	122.00	1666.00	323.00	162.00	187.00	36.00	53.00	70.00	837.00	362.00	1350.00	141.00
	MIN	1190.00	22.00	81.08	477.00	103.00	1480.00	230.00	144.00	165.00	28.00	41.00	60.00	737.00	312.00	1205.00	126.00
	STD	45.21	7.41	2.54	33.72	4.94	41.79	18.43	3.75	5.11	1.76	2.79	2.66	31.21	13.11	37.77	3.68
2005	AVG	1249.94	29.77	84.78	568.91	113.14	1535.09	290.82	149.83	176.83	31.63	47.63	65.63	796.54	338.43	1243.26	128.43
	N	35	35	35	35	35	35	34	35	35	35	35	35	28	35	35	35
	MAX	1367.00	48.00	91.46	683.00	127.00	1676.00	336.00	162.00	192.00	39.00	53.00	76.00	871.00	368.00	1370.00	140.00
	MIN	1176.00	20.00	76.11	521.00	98.00	1465.00	263.00	137.00	164.00	24.00	43.00	56.00	754.00	317.00	1177.00	120.00
	STD	39.60	6.98	2.62	34.52	6.32	40.84	17.81	5.33	6.69	3.17	2.80	3.99	28.00	12.85	37.64	5.04
2006	AVG	1264.50	30.47	85.65	575.77	111.43	1549.83	296.60	150.33	175.63	31.80	48.77	65.77	797.32	340.50	1260.33	132.17
	N	30	30	30	30	30	30	30	30	30	30	30	30	28	30	30	30
	MAX	1358.00	47.00	94.15	652.00	123.00	1675.00	330.00	161.00	185.00	36.00	55.00	72.00	903.00	380.00	1363.00	138.00
	MIN	1205.00	20.00	80.00	526.00	104.00	1474.00	260.00	140.00	166.00	29.00	44.00	58.00	731.00	310.00	1205.00	125.00
	STD	39.64	7.12	3.29	30.18	4.64	40.96	18.23	4.33	4.90	2.01	2.82	3.40	33.12	17.84	36.78	3.91
2007	AVG	1277.28	34.70	85.84	592.55	111.35	1560.68	295.41	151.37	176.47	32.05	48.38	65.32	806.40	337.02	1270.85	129.85
	N	60	60	60	60	60	60	58	60	60	60	60	60	45	60	60	60
	MAX	1375.00	54.00	93.57	650.00	124.00	1661.00	333.00	163.00	192.00	38.00	55.00	72.00	893.00	387.00	1370.00	140.00
	MIN	1207.00	20.00	78.65	534.00	98.00	1461.00	270.00	141.00	167.00	28.00	40.00	57.00	734.00	312.00	1182.00	120.00
	STD	38.71	8.06	3.17	27.66	5.69	42.66	16.04	4.35	5.62	1.93	3.14	4.14	35.33	12.99	38.19	4.62
2008	AVG	1263.40	34.25	86.12	574.68	109.55	1547.82	294.15	153.47	178.27	32.67	47.17	62.85	784.40	345.90	1258.25	132.45
	N	60	60	60	60	60	60	59	60	60	60	60	60	43	60	60	60
	MAX	1385.00	47.00	92.66	665.00	122.00	1666.00	349.00	164.00	191.00	39.00	54.00	72.00	867.00	383.00	1387.00	144.00
	MIN	1130.00	21.00	79.57	516.00	98.00	1393.00	249.00	143.00	166.00	27.00	40.00	54.00	678.00	292.00	1119.00	122.00
	STD	49.55	7.31	2.81	32.24	5.71	51.06	17.90	4.73	4.73	2.40	2.95	3.66	40.97	16.75	47.84	5.29
2009	AVG	1258.80	32.30	86.60	565.96	110.50	1546.65	294.37	151.74	175.39	32.63	48.96	64.46	794.15	336.35	1255.30	129.61
	N	46	46	46	46	46	46	46	46	46	46	46	46	41	46	46	46
	MAX	1337.00	48.00	94.61	626.00	140.00	1635.00	338.00	166.00	190.00	37.00	54.00	73.00	846.00	369.00	1354.00	141.00
	MIN	1151.00	20.00	78.19	484.00	97.00	1434.00	203.00	138.00	163.00	27.00	44.00	56.00	726.00	301.00	1166.00	120.00
	STD	38.59	7.89	3.74	25.79	7.13	41.49	22.92	5.17	6.60	2.22	2.37	4.12	26.32	15.70	37.37	4.47
2010	AVG	1271.48	35.62	85.09	573.98	111.05	1562.66	299.62	152.80	179.74	32.72	47.07	63.62	796.39	346.08	1268.49	134.39
	N	61	61	61	61	61	61	55	61	61	61	61	61	38	61	61	61
	MAX	1386.00	48.00	92.53	623.00	123.00	1700.00	340.00	165.00	200.00	40.00	53.00	70.00	867.00	383.00	1391.00	142.00
	MIN	1155.00	21.00	53.76	504.00	100.00	1430.00	260.00	100.00	166.00	28.00	40.00	56.00	730.00	292.00	1153.00	120.00
	STD	46.27	7.66	5.07	23.56	5.12	52.33	16.21	8.26	5.85	2.00	2.67	3.67	32.74	15.31	47.58	4.59
2011	AVG	1277.12	32.19	85.23	598.58	114.19	1561.04	290.73	149.96	176.00	32.58	48.96	67.15	809.55	342.27	1275.77	130.58
	N	26	26	26	26	26	26	26	26	26	26	26	26	20	26	26	26
	MAX	1373.00	52.00	89.76	696.00	123.00	1644.00	322.00	159.00	186.00	39.00	53.00	74.00	876.00	372.00	1350.00	140.00
	MIN	1180.00	19.00	82.08	543.00	104.00	1471.00	250.00	142.00	166.00	29.00	41.00	59.00	740.00	286.00	1172.00	125.00
	STD	44.67	9.87	2.11	35.86	4.90	46.76	19.27	4.47	5.30	2.74	3.05	4.12	33.48	20.49	44.23	4.30
2012	AVG	1259.37	32.25	86.00	568.05	113.47	1552.51	294.61	152.35	177.23	32.67	50.00	67.39	808.55	350.26	1260.53	133.46
	N	57	57	57	57	57	57	56	57	57	57	57	57	40	57	57	57
	MAX	1349.00	58.00	92.05	620.00	122.00	1652.00	341.00	162.00	186.00	38.00	58.00	75.00	896.00	385.00	1357.00	141.00
	MIN	1176.00	19.00	79.57	503.00	103.00	1462.00	255.00	145.00	165.00	27.00	44.00	60.00	735.00	317.00	1176.00	125.00

Table A-10 (Continued)

ID	STAT	ACH	AGE	CEI	DAH	FAH	HGT	ICB	MCB	MCL	NAB	NAL	NPH	PUH	SHB	STH	ZYB
	STD	43.92	10.08	2.62	24.80	4.53	48.71	14.97	3.85	4.61	2.26	2.76	4.16	39.58	15.76	43.33	3.83
2013	AVG	1254.58	38.40	85.97	559.97	112.05	1551.38	295.23	150.80	175.50	32.88	49.43	64.45	798.76	344.73	1260.35	130.05
	N	40	40	40	39	40	40	40	40	40	40	40	40	25	40	40	40
	MAX	1360.00	60.00	92.35	625.00	118.00	1696.00	340.00	162.00	186.00	43.00	55.00	73.00	876.00	374.00	1367.00	145.00
	MIN	1134.00	23.00	81.22	407.00	99.00	1444.00	263.00	141.00	165.00	28.00	45.00	57.00	740.00	312.00	1152.00	120.00
	STD	48.43	9.29	2.80	38.17	4.35	53.55	20.64	4.32	5.18	2.85	2.80	3.77	39.34	15.73	48.05	4.74
2014	AVG	1268.84	27.27	86.18	598.02	112.96	1559.51	286.73	152.29	176.76	30.67	50.33	67.39	790.58	340.92	1273.55	133.47
	N	51	51	51	51	51	51	51	51	51	51	51	51	48	51	51	51
	MAX	1376.00	47.00	91.30	675.00	127.00	1662.00	324.00	168.00	188.00	40.00	59.00	80.00	856.00	385.00	1371.00	144.00
	MIN	1161.00	19.00	81.77	529.00	101.00	1454.00	250.00	142.00	160.00	27.00	45.00	55.00	688.00	270.00	1174.00	125.00
	STD	51.61	7.70	2.46	30.44	5.84	49.61	18.94	4.92	5.21	2.11	3.40	4.67	39.82	20.13	44.75	5.03
2015	AVG	1263.69	30.00	85.28	584.53	111.47	1551.24	292.59	149.78	175.67	32.22	48.27	66.18	790.03	345.38	1265.38	130.91
	N	45	45	45	45	45	45	44	45	45	45	45	45	39	45	45	45
	MAX	1358.00	42.00	90.17	639.00	125.00	1654.00	330.00	162.00	185.00	37.00	53.00	74.00	842.00	388.00	1344.00	140.00
	MIN	1170.00	20.00	81.42	518.00	100.00	1448.00	260.00	140.00	164.00	29.00	43.00	56.00	744.00	285.00	1175.00	124.00
	STD	41.45	6.13	2.48	27.74	4.92	45.00	14.17	5.46	5.27	1.70	2.72	4.18	27.68	15.92	39.59	3.71
2016	AVG	1256.02	33.10	85.44	573.58	110.37	1541.84	291.93	150.08	175.81	32.15	47.60	64.34	789.46	343.00	1254.00	130.31
	N	62	62	62	62	62	62	61	62	62	62	62	62	41	62	62	62
	MAX	1371.00	48.00	91.95	679.00	122.00	1678.00	333.00	165.00	190.00	37.00	57.00	71.00	884.00	382.00	1380.00	145.00
	MIN	1166.00	20.00	78.38	518.00	95.00	1437.00	265.00	140.00	163.00	27.00	40.00	55.00	680.00	287.00	1182.00	120.00
	STD	42.75	8.39	3.16	31.30	5.50	47.17	16.32	4.54	6.31	2.48	3.39	3.55	39.30	17.69	38.33	4.55
2017	AVG	1269.18	30.76	85.74	586.75	114.02	1556.06	292.61	152.06	177.49	32.24	49.49	67.69	795.98	349.92	1268.16	133.27
	N	51	51	51	51	51	51	51	51	51	51	51	51	49	51	51	51
	MAX	1346.00	47.00	91.43	648.00	126.00	1636.00	325.00	160.00	191.00	36.00	57.00	82.00	876.00	378.00	1389.00	143.00
	MIN	1133.00	21.00	77.96	476.00	104.00	1408.00	263.00	141.00	164.00	28.00	41.00	60.00	711.00	320.00	1150.00	125.00
	STD	43.98	6.51	3.14	33.15	5.19	45.19	15.14	4.43	5.74	1.85	3.52	4.66	34.24	13.42	43.37	4.85
2018	AVG	1260.55	36.61	85.72	571.88	111.61	1543.36	290.63	152.45	177.97	33.45	50.36	64.94	804.15	339.82	1256.06	130.12
	N	33	33	33	33	33	33	32	33	33	33	33	33	13	33	33	33
	MAX	1348.00	55.00	91.81	623.00	127.00	1640.00	322.00	162.00	195.00	37.00	58.00	75.00	849.00	377.00	1332.00	140.00
	MIN	1195.00	21.00	79.89	524.00	101.00	1479.00	263.00	143.00	168.00	30.00	46.00	58.00	748.00	309.00	1195.00	120.00
	STD	36.72	10.37	3.13	29.02	5.38	35.69	14.12	4.49	5.55	1.89	2.76	4.18	29.48	17.48	33.07	4.94
2019	AVG	1269.81	31.58	85.87	577.04	111.73	1548.58	301.38	150.85	175.77	32.58	49.38	66.65	812.00	348.62	1262.68	130.81
	N	26	26	26	26	26	26	26	26	26	26	26	26	21	26	25	26
	MAX	1338.00	47.00	92.90	643.00	123.00	1621.00	332.00	161.00	183.00	36.00	57.00	73.00	850.00	380.00	1326.00	139.00
	MIN	1198.00	20.00	80.33	526.00	101.00	1468.00	278.00	144.00	169.00	29.00	44.00	60.00	745.00	320.00	1197.00	125.00
	STD	37.34	8.34	3.24	33.12	4.85	39.87	14.01	4.44	4.74	1.92	2.93	3.17	27.61	15.74	33.88	3.76
2020	AVG	1251.74	32.26	85.56	571.55	110.53	1535.84	290.54	150.47	175.95	31.63	47.03	65.74	778.39	334.97	1245.21	129.21
	N	38	38	38	38	38	38	37	38	38	38	38	38	28	38	38	38
	MAX	1355.00	50.00	93.17	641.00	120.00	1642.00	340.00	166.00	188.00	37.00	52.00	71.00	860.00	383.00	1334.00	143.00
	MIN	1115.00	19.00	78.65	491.00	98.00	1372.00	250.00	140.00	161.00	27.00	43.00	60.00	643.00	303.00	1107.00	121.00
	STD	55.24	7.61	2.97	34.80	4.31	59.09	18.61	5.57	6.02	2.21	2.47	2.90	53.58	16.62	51.74	4.52
2021	AVG	1260.12	33.36	85.80	577.93	112.63	1549.96	289.55	151.95	177.25	32.04	49.45	65.63	791.43	347.32	1259.14	131.40
	N	101	102	102	101	102	102	97	102	102	102	102	102	74	101	101	102
	MAX	1374.00	73.00	94.25	640.00	125.00	1667.00	340.00	165.00	193.00	38.00	60.00	77.00	869.00	390.00	1356.00	144.00
	MIN	1173.00	20.00	74.61	510.00	95.00	1455.00	253.00	140.00	165.00	28.00	43.00	55.00	590.00	292.00	1178.00	120.00
	STD	44.07	10.48	3.24	26.28	5.77	49.33	19.18	4.46	5.96	2.00	3.56	4.32	42.53	21.49	41.86	5.04
2022	AVG	1268.85	31.64	87.12	586.47	109.21	1556.91	292.67	153.00	175.72	32.12	48.66	63.35	803.15	341.32	1267.84	132.38
	N	116	116	116	116	116	116	113	116	116	116	116	116	82	116	116	116
	MAX	1391.00	48.00	94.77	660.00	121.00	1684.00	345.00	163.00	189.00	40.00	57.00	70.00	882.00	390.00	1388.00	145.00
	MIN	1161.00	20.00	79.37	517.00	97.00	1423.00	252.00	144.00	163.00	26.00	43.00	54.00	713.00	293.00	1163.00	120.00
	STD	41.84	7.30	2.84	29.61	5.31	47.89	18.42	3.97	4.78	2.22	2.92	3.57	34.56	17.26	42.56	5.05
2023	AVG	1256.53	29.70	85.95	577.13	108.63	1542.26	289.37	152.16	177.20	31.50	47.51	63.89	793.21	343.09	1253.90	131.13
	N	80	80	80	80	80	80	79	80	80	80	80	80	66	80	80	80
	MAX	1407.00	46.00	94.44	693.00	123.00	1700.00	330.00	163.00	193.00	35.00	57.00	74.00	873.00	373.00	1405.00	140.00
	MIN	1156.00	18.00	77.72	510.00	94.00	1433.00	250.00	140.00	162.00	24.00	37.00	54.00	705.00	290.00	1163.00	122.00
	STD	47.28	7.10	3.46	30.42	5.94	52.57	18.90	4.79	6.32	1.90	3.53	4.26	37.47	16.89	47.59	4.46

Table A-10 (Continued)

ID	STAT	ACH	AGE	CEI	DAH	FAH	HGT	ICB	MCB	MCL	NAB	NAL	NPH	PUH	SHB	STH	ZYB
2024	AVG	1277.72	37.29	85.71	580.42	115.57	1566.43	300.55	152.25	177.73	32.35	50.96	69.08	817.69	351.27	1276.18	131.78
	N	50	51	51	50	51	51	51	51	51	51	51	51	39	51	50	51
	MAX	1378.00	60.00	93.37	646.00	127.00	1663.00	330.00	167.00	187.00	37.00	57.00	80.00	876.00	388.00	1388.00	139.00
	MIN	1183.00	18.00	79.12	512.00	102.00	1443.00	273.00	144.00	166.00	29.00	45.00	60.00	757.00	320.00	1190.00	123.00
	STD	48.93	11.51	3.25	29.07	5.39	50.34	13.93	5.35	5.18	2.17	2.81	4.09	33.63	15.76	46.78	4.08
2025	AVG	1260.62	30.98	86.70	576.44	110.14	1546.91	295.33	152.05	175.52	31.71	47.48	64.05	798.67	343.13	1260.93	131.32
	N	111	111	111	111	111	111	111	111	111	111	111	111	87	111	111	111
	MAX	1356.00	49.00	93.98	646.00	123.00	1661.00	327.00	163.00	193.00	36.00	54.00	71.00	873.00	380.00	1373.00	145.00
	MIN	1178.00	20.00	78.14	506.00	98.00	1455.00	248.00	140.00	163.00	25.00	41.00	55.00	728.00	304.00	1175.00	121.00
	STD	39.92	6.85	3.23	26.96	4.91	44.33	15.39	4.60	5.87	2.27	3.13	4.05	33.23	14.16	39.47	4.50
2026	AVG	1266.87	30.94	86.05	574.57	110.05	1559.44	288.81	151.35	175.98	31.57	48.78	64.89	809.37	339.86	1267.76	131.75
	N	63	63	63	63	63	63	62	63	63	63	63	63	54	63	63	63
	MAX	1390.00	45.00	93.37	647.00	123.00	1687.00	340.00	165.00	189.00	37.00	57.00	71.00	907.00	380.00	1390.00	141.00
	MIN	1152.00	20.00	80.79	536.00	100.00	1442.00	245.00	143.00	164.00	27.00	43.00	58.00	720.00	309.00	1154.00	120.00
	STD	48.20	7.12	2.59	26.96	5.01	51.06	18.00	4.39	5.49	2.04	2.49	3.76	39.89	14.84	43.96	4.95
2027	AVG	1276.07	29.95	85.82	594.21	110.48	1556.48	296.02	150.72	175.72	32.79	47.54	65.82	800.56	343.93	1272.12	133.52
	N	61	61	61	61	61	61	61	61	61	61	61	61	54	61	60	61
	MAX	1386.00	44.00	91.53	652.00	121.00	1670.00	326.00	162.00	188.00	37.00	56.00	77.00	876.00	380.00	1376.00	146.00
	MIN	1191.00	20.00	78.92	544.00	97.00	1297.00	260.00	142.00	164.00	30.00	42.00	58.00	736.00	307.00	1188.00	125.00
	STD	43.40	6.38	2.91	26.54	4.58	56.91	14.84	4.66	5.62	1.72	2.76	3.66	34.14	17.26	42.05	5.04
2028	AVG	1260.84	32.70	86.46	577.45	114.14	1542.02	294.86	151.79	175.64	31.48	48.20	66.55	797.37	348.04	1252.30	130.66
	N	56	56	56	56	56	56	56	56	56	56	56	56	38	56	56	56
	MAX	1365.00	50.00	93.06	668.00	123.00	1667.00	330.00	163.00	187.00	36.00	57.00	75.00	873.00	380.00	1362.00	142.00
	MIN	1133.00	20.00	80.90	518.00	103.00	1409.00	247.00	142.00	164.00	23.00	40.00	58.00	718.00	314.00	1131.00	120.00
	STD	54.42	8.71	2.97	33.11	5.10	57.00	19.13	5.00	5.06	2.05	3.54	4.02	39.97	16.36	51.20	5.40
2029	AVG	1258.76	32.82	86.04	576.53	113.33	1551.63	291.33	151.43	176.08	32.31	50.24	67.80	807.67	342.39	1259.82	131.55
	N	51	51	51	51	51	51	51	51	51	51	51	51	46	51	51	51
	MAX	1337.00	48.00	95.06	630.00	125.00	1650.00	333.00	167.00	187.00	38.00	57.00	76.00	873.00	371.00	1341.00	142.00
	MIN	1172.00	22.00	79.89	517.00	104.00	1461.00	259.00	141.00	162.00	28.00	41.00	60.00	752.00	312.00	1184.00	122.00
	STD	39.41	6.92	3.27	25.77	4.63	42.78	15.11	5.22	4.82	2.13	3.51	3.78	30.24	13.48	38.39	4.93
2030	AVG	1261.50	31.05	85.21	573.09	111.75	1549.47	296.09	150.14	176.33	31.70	49.20	67.25	814.14	341.02	1258.66	133.13
	N	64	64	64	64	64	64	64	64	64	64	64	64	57	64	64	64
	MAX	1385.00	54.00	94.01	654.00	126.00	1676.00	347.00	160.00	187.00	36.00	55.00	74.00	880.00	371.00	1383.00	146.00
	MIN	1160.00	20.00	76.88	498.00	96.00	1432.00	250.00	139.00	161.00	27.00	43.00	53.00	712.00	305.00	1152.00	122.00
	STD	46.15	10.62	3.33	32.51	5.80	48.96	18.26	4.91	5.90	1.74	3.04	4.09	33.90	14.89	44.98	5.00
2031	AVG	1251.47	31.08	85.96	571.32	110.09	1542.23	290.97	150.89	175.62	31.56	49.18	66.20	802.43	341.20	1254.02	131.42
	N	66	66	66	66	66	66	66	66	66	66	66	66	58	66	66	66
	MAX	1369.00	50.00	94.12	634.00	125.00	1673.00	325.00	163.00	185.00	36.00	57.00	76.00	899.00	383.00	1367.00	141.00
	MIN	1103.00	20.00	78.57	483.00	98.00	1446.00	260.00	141.00	161.00	27.00	44.00	58.00	691.00	307.00	1115.00	118.00
	STD	50.93	7.85	2.88	28.86	5.20	51.65	15.43	4.81	5.27	2.02	3.17	3.96	40.90	16.45	49.00	4.77
2032	AVG	1254.54	28.79	86.36	568.86	113.19	1543.25	298.41	152.29	176.49	32.00	48.38	66.00	790.34	346.03	1253.24	133.27
	N	63	63	63	63	63	63	63	63	63	63	63	63	47	63	63	63
	MAX	1355.00	47.00	99.38	620.00	131.00	1657.00	335.00	162.00	186.00	37.00	56.00	78.00	865.00	380.00	1354.00	142.00
	MIN	1105.00	19.00	79.56	520.00	103.00	1385.00	266.00	143.00	161.00	27.00	41.00	58.00	670.00	285.00	1122.00	121.00
	STD	46.13	6.84	3.64	23.64	5.12	48.17	17.50	4.44	5.33	2.14	3.15	3.97	37.03	15.48	44.21	4.46
2033	AVG	1262.50	31.96	84.61	582.38	113.42	1550.04	291.44	149.73	177.08	33.54	49.62	67.54	785.04	340.73	1261.88	130.00
	N	26	26	26	26	26	26	25	26	26	26	26	26	24	26	26	26
	MAX	1378.00	42.00	89.29	650.00	126.00	1670.00	318.00	163.00	185.00	38.00	60.00	77.00	846.00	368.00	1384.00	137.00
	MIN	1157.00	21.00	79.01	515.00	103.00	1437.00	253.00	143.00	167.00	28.00	43.00	59.00	701.00	312.00	1166.00	123.00
	STD	50.41	6.09	2.90	30.79	5.79	54.12	14.45	4.43	5.33	2.16	4.29	4.50	30.37	14.55	50.50	4.06
2034	AVG	1278.97	32.87	86.58	587.71	112.84	1568.81	296.19	153.42	177.26	32.84	48.42	65.94	808.39	341.23	1275.94	132.74
	N	31	31	31	31	31	31	31	31	31	31	31	31	23	31	31	31
	MAX	1360.00	49.00	94.71	638.00	124.00	1642.00	322.00	161.00	183.00	39.00	53.00	73.00	884.00	367.00	1350.00	142.00
	MIN	1200.00	22.00	83.43	533.00	103.00	1470.00	272.00	147.00	168.00	30.00	41.00	57.00	743.00	312.00	1195.00	123.00
	STD	41.83	8.86	2.30	29.65	4.78	40.87	14.94	3.78	4.14	2.28	2.88	3.86	38.04	13.99	40.05	4.66
2036	AVG	1252.49	33.37	86.49	580.31	109.33	1537.55	292.33	149.59	173.06	32.12	47.96	63.88	797.23	340.98	1248.90	131.14

Table A-10 (Continued)

ID	STAT	ACH	AGE	CEI	DAH	FAH	HGT	ICB	MCB	MCL	NAB	NAL	NPH	PUH	SHB	STH	ZYB
	N	49	49	49	49	49	49	49	49	49	49	49	49	43	49	49	49
	MAX	1350.00	49.00	95.15	660.00	117.00	1628.00	325.00	160.00	183.00	37.00	52.00	70.00	873.00	374.00	1332.00	142.00
	MIN	1182.00	21.00	79.10	515.00	100.00	1441.00	257.00	140.00	162.00	28.00	42.00	58.00	730.00	307.00	1167.00	120.00
	STD	38.41	8.07	2.99	29.64	4.38	43.46	16.52	4.60	5.23	1.82	2.41	3.13	30.88	14.24	39.17	4.98
2037	AVG	1281.28	32.12	86.04	601.54	115.10	1568.19	299.49	152.64	177.46	31.25	51.00	68.20	805.13	350.77	1278.91	133.19
	N	68	69	69	68	69	69	67	69	69	69	69	69	53	69	69	69
	MAX	1398.00	49.00	90.75	682.00	128.00	1685.00	350.00	163.00	186.00	36.00	60.00	80.00	880.00	400.00	1381.00	147.00
	MIN	1195.00	20.00	78.89	542.00	104.00	1476.00	262.00	142.00	167.00	27.00	44.00	60.00	730.00	320.00	1200.00	120.00
	STD	43.42	8.26	2.41	29.53	4.54	44.50	20.31	4.28	4.44	1.94	3.33	3.84	38.06	17.50	39.61	5.27
2038	AVG	1251.34	34.41	86.85	565.31	109.07	1538.14	289.97	151.07	174.07	32.86	49.03	64.28	794.46	341.48	1249.83	129.93
	N	29	29	29	29	29	29	29	29	29	29	29	29	28	29	29	29
	MAX	1325.00	57.00	93.49	618.00	119.00	1634.00	314.00	158.00	184.00	38.00	54.00	71.00	877.00	397.00	1330.00	138.00
	MIN	1177.00	22.00	79.89	508.00	101.00	1456.00	263.00	143.00	165.00	30.00	43.00	58.00	724.00	301.00	1177.00	120.00
	STD	38.79	9.10	3.06	24.75	4.87	45.06	13.27	3.51	4.96	2.28	2.76	3.58	39.96	21.39	39.94	4.49
2039	AVG	1252.16	31.09	87.12	568.36	110.64	1541.36	295.13	152.39	175.07	31.20	48.77	65.75	804.30	338.29	1251.32	131.46
	N	56	56	56	56	56	55	56	56	56	56	56	56	44	56	56	56
	MAX	1355.00	50.00	96.91	628.00	120.00	1649.00	327.00	171.00	186.00	36.00	57.00	73.00	883.00	385.00	1349.00	140.00
	MIN	1160.00	19.00	80.65	521.00	100.00	1426.00	271.00	141.00	161.00	27.00	44.00	57.00	710.00	312.00	1154.00	122.00
	STD	42.20	6.38	3.49	26.53	4.54	47.93	14.87	4.82	5.81	1.99	2.75	3.43	32.18	15.34	40.80	3.94
2040	AVG	1258.38	36.59	87.03	570.70	108.59	1544.70	294.08	152.65	175.49	32.35	48.03	63.76	788.39	343.59	1256.62	128.92
	N	37	37	37	37	37	37	37	37	37	37	37	37	28	37	37	37
	MAX	1380.00	48.00	96.97	650.00	118.00	1691.00	351.00	164.00	185.00	38.00	58.00	71.00	854.00	383.00	1378.00	140.00
	MIN	1112.00	23.00	81.92	504.00	95.00	1406.00	260.00	143.00	165.00	26.00	43.00	55.00	674.00	304.00	1124.00	120.00
	STD	50.56	7.77	3.06	28.63	5.95	53.91	19.58	4.37	4.35	2.02	3.05	4.37	40.98	18.35	47.19	5.00
2041	AVG	1271.00	34.64	85.67	576.88	112.45	1563.98	300.60	152.12	177.73	32.27	48.73	65.83	806.84	340.38	1269.73	132.80
	N	66	66	66	66	66	66	63	66	66	66	66	66	51	66	66	66
	MAX	1365.00	50.00	92.61	648.00	135.00	1666.00	340.00	163.00	191.00	41.00	60.00	80.00	881.00	373.00	1360.00	145.00
	MIN	1167.00	23.00	75.39	493.00	98.00	1471.00	262.00	139.00	161.00	26.00	40.00	54.00	737.00	300.00	1172.00	120.00
	STD	43.21	7.49	3.35	29.07	6.34	44.99	15.65	4.45	6.15	2.79	3.92	5.02	37.16	16.80	40.49	5.42
2042	AVG	1261.21	37.68	84.63	581.55	111.82	1546.23	295.50	148.11	175.13	32.05	49.21	66.54	808.19	344.16	1259.32	128.70
	N	56	56	56	56	56	56	54	56	56	56	56	56	42	56	56	56
	MAX	1362.00	70.00	91.72	643.00	122.00	1643.00	340.00	158.00	184.00	40.00	57.00	73.00	870.00	390.00	1340.00	140.00
	MIN	1155.00	19.00	78.33	497.00	100.00	1438.00	247.00	138.00	163.00	29.00	42.00	50.00	745.00	312.00	1178.00	118.00
	STD	47.53	13.59	3.26	30.43	5.51	52.91	18.91	4.43	4.61	1.92	3.19	4.41	36.95	17.41	42.88	4.84
2043	AVG	1254.69	32.28	85.25	575.90	111.23	1542.85	292.70	150.28	176.39	32.85	48.02	64.89	789.94	341.16	1257.39	129.11
	N	61	61	61	61	61	61	60	61	61	61	61	61	52	61	61	61
	MAX	1356.00	46.00	95.29	650.00	123.00	1665.00	328.00	162.00	187.00	36.00	56.00	78.00	864.00	373.00	1356.00	137.00
	MIN	1081.00	19.00	79.44	495.00	100.00	1342.00	246.00	140.00	163.00	29.00	40.00	54.00	544.00	300.00	1074.00	120.00
	STD	47.93	6.96	3.12	30.46	5.69	53.11	18.14	4.40	5.27	1.41	3.67	4.65	49.51	15.85	48.56	4.19
2044	AVG	1263.80	35.17	85.51	577.71	111.43	1548.77	294.77	152.00	177.86	32.71	48.46	64.43	802.89	338.94	1256.60	130.51
	N	35	35	35	35	35	35	35	35	35	35	35	35	27	35	35	35
	MAX	1395.00	48.00	91.95	654.00	124.00	1682.00	332.00	161.00	190.00	38.00	55.00	72.00	893.00	381.00	1373.00	142.00
	MIN	1191.00	21.00	78.14	521.00	101.00	1465.00	261.00	143.00	168.00	30.00	42.00	54.00	736.00	304.00	1183.00	122.00
	STD	53.00	8.28	3.22	30.02	5.54	56.21	16.55	4.63	4.79	1.87	3.10	4.00	38.32	17.08	49.84	4.86
2045	AVG	1256.47	34.95	85.81	575.82	111.95	1547.16	290.81	149.55	174.45	32.34	48.32	65.76	807.86	343.76	1251.05	128.16
	N	38	38	38	38	38	38	37	38	38	38	38	38	22	38	38	38
	MAX	1414.00	57.00	101.29	644.00	121.00	1687.00	330.00	160.00	187.00	37.00	53.00	73.00	940.00	393.00	1403.00	140.00
	MIN	1175.00	21.00	78.33	520.00	105.00	1423.00	257.00	137.00	155.00	28.00	41.00	59.00	720.00	313.00	1160.00	116.00
	STD	53.85	10.79	3.86	30.10	4.39	61.47	16.74	5.35	6.26	2.23	2.23	3.52	53.07	19.45	51.93	5.28
2046	AVG	1265.08	26.90	86.12	572.08	110.67	1559.84	288.65	151.29	175.78	30.43	48.94	64.75	803.46	334.49	1265.65	129.37
	N	51	51	51	51	51	51	51	51	51	51	51	51	48	51	51	51
	MAX	1372.00	47.00	93.79	626.00	124.00	1682.00	314.00	166.00	191.00	35.00	56.00	74.00	920.00	370.00	1365.00	143.00
	MIN	1185.00	20.00	77.78	530.00	100.00	1455.00	253.00	141.00	160.00	26.00	43.00	60.00	730.00	291.00	1164.00	120.00
	STD	43.55	5.88	3.06	23.93	5.58	49.72	12.63	5.38	6.20	1.91	3.07	3.41	41.86	16.36	44.39	5.17
2047	AVG	1267.06	33.38	85.87	574.79	110.06	1555.41	292.47	149.74	174.47	32.18	48.56	65.18	810.53	338.09	1266.71	129.15
	N	34	34	34	34	34	34	34	34	34	34	34	34	32	34	34	34

Table A-10 (Continued)

ID	STAT	ACH	AGE	CEI	DAH	FAH	HGT	ICB	MCB	MCL	NAB	NAL	NPH	PUH	SHB	STH	ZYB
	MAX	1380.00	49.00	93.33	673.00	118.00	1666.00	340.00	163.00	184.00	35.00	54.00	71.00	904.00	367.00	1371.00	135.00
	MIN	1183.00	20.00	79.89	508.00	101.00	1458.00	247.00	143.00	160.00	28.00	44.00	60.00	735.00	317.00	1185.00	120.00
	STD	49.68	9.17	2.77	36.34	4.28	48.90	18.71	4.11	5.34	1.66	2.43	3.09	42.87	13.42	45.14	4.61
	AVG	1250.28	31.16	86.00	568.58	112.00	1543.09	294.44	152.70	177.65	31.63	49.26	66.53	802.24	341.58	1252.23	132.07
2048	N	43	43	43	43	43	43	43	43	43	43	43	43	37	43	43	43
	MAX	1347.00	46.00	93.37	632.00	125.00	1669.00	320.00	165.00	187.00	36.00	56.00	80.00	894.00	374.00	1356.00	140.00
	MIN	1126.00	20.00	79.44	496.00	103.00	1413.00	270.00	143.00	166.00	26.00	41.00	58.00	700.00	313.00	1134.00	123.00
	STD	48.25	6.57	2.78	30.06	4.54	50.46	13.19	4.52	5.06	2.17	3.31	4.07	41.46	13.66	42.51	4.45
	AVG	1241.75	33.21	84.73	565.50	112.25	1528.46	290.61	151.13	178.46	32.00	49.21	65.92	789.50	330.17	1241.08	129.50
	N	24	24	24	24	24	24	23	24	24	24	24	24	18	24	24	24
	MAX	1324.00	45.00	88.95	616.00	125.00	1630.00	316.00	161.00	187.00	35.00	57.00	76.00	856.00	357.00	1326.00	138.00
	MIN	1151.00	20.00	79.68	495.00	98.00	1430.00	259.00	141.00	161.00	29.00	43.00	56.00	710.00	304.00	1154.00	123.00
2049	STD	43.93	6.99	2.63	31.75	6.15	51.17	11.58	4.88	6.35	1.50	3.46	4.85	38.73	12.18	45.19	4.56
	AVG	1244.00	29.16	85.68	558.57	111.26	1538.67	289.71	150.07	175.29	31.91	50.45	68.17	800.02	339.78	1245.55	129.90
	N	58	58	58	58	58	58	58	58	58	58	58	58	51	58	58	58
	MAX	1357.00	42.00	92.40	630.00	123.00	1660.00	320.00	161.00	192.00	37.00	58.00	79.00	900.00	380.00	1356.00	143.00
	MIN	1138.00	20.00	77.89	468.00	98.00	1428.00	257.00	142.00	164.00	26.00	43.00	59.00	701.00	300.00	1143.00	120.00
2050	STD	52.72	5.77	3.06	31.75	5.46	55.89	14.88	4.32	5.90	1.91	3.03	4.25	39.91	16.80	50.53	4.96
	AVG	1267.49	31.71	85.96	569.53	112.47	1563.49	297.59	151.45	176.31	31.80	51.04	67.78	816.36	346.41	1270.16	130.63
	N	49	49	49	49	49	49	49	49	49	49	49	49	39	49	49	49
	MAX	1411.00	46.00	94.61	632.00	125.00	1721.00	350.00	163.00	190.00	37.00	57.00	76.00	883.00	392.00	1410.00	142.00
2051	MIN	1118.00	20.00	78.14	501.00	103.00	1385.00	264.00	139.00	161.00	28.00	45.00	60.00	741.00	301.00	1117.00	119.00
	STD	53.46	6.26	3.32	31.94	4.79	55.71	16.31	5.45	5.82	1.99	2.75	3.50	39.17	17.91	50.23	4.97
	AVG	1265.48	32.61	84.88	580.74	114.84	1558.87	293.74	150.75	177.72	31.66	51.02	68.80	814.93	345.28	1267.54	132.31
	N	61	61	61	61	61	61	61	61	61	61	61	61	56	61	61	61
	MAX	1390.00	47.00	92.86	663.00	124.00	1683.00	350.00	162.00	190.00	36.00	58.00	80.00	914.00	383.00	1432.00	148.00
	MIN	1127.00	21.00	77.66	502.00	105.00	1434.00	260.00	143.00	162.00	26.00	44.00	60.00	721.00	303.00	1141.00	122.00
2052	STD	54.84	6.82	2.92	32.84	4.39	57.50	17.00	4.28	5.34	1.96	2.92	4.23	40.88	19.75	53.79	4.88
	AVG	1252.74	29.61	86.60	569.30	110.51	1540.85	290.00	152.34	176.03	31.43	49.33	65.80	797.86	341.66	1251.07	131.90
	N	61	61	61	61	61	61	61	61	61	61	61	61	56	61	61	61
	MAX	1354.00	44.00	96.47	659.00	124.00	1650.00	316.00	164.00	195.00	38.00	58.00	77.00	870.00	367.00	1346.00	148.00
2053	MIN	1167.00	20.00	80.00	502.00	101.00	1456.00	252.00	142.00	161.00	28.00	43.00	60.00	722.00	300.00	1172.00	121.00
	STD	44.94	6.40	2.87	30.22	5.18	46.30	13.47	4.83	6.27	1.79	3.32	4.13	39.21	14.39	42.10	4.82
	AVG	1268.83	31.74	87.43	568.71	112.83	1554.48	297.81	153.88	176.10	32.74	49.88	66.69	808.62	342.17	1263.14	130.98
	N	42	42	42	42	42	42	42	42	42	42	42	42	37	42	42	42
	MAX	1395.00	46.00	94.22	611.00	125.00	1665.00	330.00	163.00	190.00	38.00	60.00	75.00	943.00	382.00	1372.00	144.00
	MIN	1170.00	21.00	80.21	508.00	103.00	1455.00	271.00	140.00	164.00	29.00	45.00	60.00	751.00	320.00	1170.00	120.00
2054	STD	47.63	8.35	3.09	24.51	5.97	51.14	14.46	4.99	5.39	1.87	3.03	4.49	41.22	14.75	45.97	5.11
	AVG	1263.17	32.39	86.17	589.14	111.14	1551.26	291.97	150.77	175.09	31.90	48.96	65.19	796.27	339.79	1260.60	131.23
	N	70	70	70	70	70	70	70	70	70	70	70	70	59	70	70	70
	MAX	1389.00	48.00	98.16	644.00	123.00	1692.00	360.00	162.00	185.00	38.00	55.00	77.00	880.00	380.00	1378.00	145.00
2055	MIN	1146.00	19.00	79.01	522.00	99.00	1435.00	257.00	141.00	163.00	29.00	43.00	54.00	696.00	295.00	1156.00	120.00
	STD	48.22	8.46	3.22	25.72	5.75	51.20	19.58	4.56	5.24	2.02	2.72	4.44	37.25	15.25	46.15	5.32
	AVG	1256.86	32.03	86.40	575.09	108.85	1548.92	294.42	150.86	174.77	31.31	47.60	63.74	799.74	340.49	1258.31	130.82
	N	65	65	65	65	65	65	65	65	65	65	65	65	46	65	65	65
	MAX	1351.00	47.00	95.00	641.00	117.00	1635.00	340.00	165.00	188.00	38.00	55.00	73.00	868.00	380.00	1348.00	144.00
	MIN	1183.00	20.00	79.01	528.00	100.00	1455.00	228.00	140.00	160.00	27.00	43.00	56.00	734.00	303.00	1172.00	118.00
2056	STD	39.26	7.35	3.38	25.84	4.62	44.25	20.76	4.50	5.88	2.32	2.95	3.89	29.78	15.25	38.84	4.86
	AVG	1273.40	35.07	84.61	590.13	109.87	1559.20	287.43	149.93	177.33	32.60	47.07	64.93	818.30	331.40	1266.53	129.93
	N	15	15	15	15	15	15	14	15	15	15	15	15	10	15	15	15
	MAX	1321.00	59.00	88.62	626.00	119.00	1642.00	304.00	161.00	187.00	39.00	53.00	71.00	856.00	381.00	1321.00	137.00
2057	MIN	1201.00	24.00	76.47	541.00	100.00	1465.00	270.00	140.00	167.00	27.00	43.00	58.00	772.00	243.00	1174.00	117.00
	STD	36.18	9.98	3.41	27.01	5.34	46.86	11.95	5.30	5.92	3.46	3.43	4.06	25.99	30.54	39.09	5.66
	AVG	1262.12	31.97	85.23	589.07	116.93	1549.46	291.80	149.37	175.37	32.20	52.15	71.29	802.12	344.64	1262.07	130.92
	N	59	59	59	59	59	59	59	59	59	59	59	59	51	59	59	59
	MAX	1372.00	50.00	91.25	686.00	126.00	1674.00	333.00	160.00	190.00	38.00	60.00	80.00	881.00	390.00	1375.00	140.00
	STD																

Table A-10 (Continued)

ID	STAT	ACH	AGE	CEI	DAH	FAH	HGT	ICB	MCB	MCL	NAB	NAL	NPH	PUH	SHB	STH	ZYB
	MIN	1180.00	20.00	78.33	510.00	101.00	1457.00	260.00	140.00	160.00	29.00	44.00	62.00	730.00	300.00	1174.00	120.00
	STD	43.36	8.99	3.00	34.14	4.45	48.96	15.31	4.74	5.92	2.02	3.54	4.09	33.10	16.73	43.16	4.50
2059	AVG	1257.43	32.90	86.89	562.83	112.86	1544.26	297.18	154.95	178.40	32.93	47.86	64.67	793.68	346.60	1254.31	133.52
	N	42	42	42	42	42	42	40	42	42	42	42	42	25	42	42	42
	MAX	1420.00	49.00	92.98	674.00	127.00	1715.00	341.00	163.00	190.00	38.00	53.00	75.00	970.00	382.00	1420.00	143.00
	MIN	1120.00	21.00	79.35	496.00	105.00	1395.00	200.00	146.00	171.00	29.00	43.00	58.00	732.00	322.00	1124.00	124.00
	STD	56.87	8.33	2.93	33.96	4.65	60.58	22.08	4.74	4.64	1.70	2.48	4.02	46.86	13.13	55.55	4.76
2060	AVG	1264.76	33.98	86.82	578.93	111.90	1552.51	294.59	153.63	177.17	31.90	47.51	64.41	797.88	342.46	1257.15	133.15
	N	41	41	41	41	41	41	41	41	41	41	41	41	32	41	41	41
	MAX	1343.00	55.00	97.65	628.00	122.00	1677.00	355.00	166.00	200.00	40.00	55.00	73.00	860.00	393.00	1331.00	146.00
	MIN	1181.00	20.00	76.50	507.00	97.00	1453.00	265.00	145.00	166.00	28.00	40.00	54.00	716.00	306.00	1174.00	121.00
	STD	41.33	8.90	3.92	31.05	5.89	48.41	16.85	4.95	6.66	2.18	3.11	4.78	32.39	16.66	42.92	5.36
2061	AVG	1265.08	30.12	86.53	582.49	117.35	1552.84	292.69	152.24	176.06	31.55	50.73	70.67	797.18	343.00	1260.39	133.53
	N	51	51	51	51	51	51	51	51	51	51	51	51	44	51	51	51
	MAX	1371.00	48.00	95.15	663.00	131.00	1661.00	321.00	162.00	188.00	36.00	61.00	86.00	873.00	380.00	1353.00	141.00
	MIN	1173.00	19.00	79.89	509.00	104.00	1453.00	270.00	143.00	164.00	28.00	41.00	61.00	695.00	300.00	1174.00	125.00
	STD	46.06	6.86	3.08	32.11	5.77	49.27	11.42	4.58	5.56	2.00	3.64	4.69	40.35	15.37	44.13	4.17
2062	AVG	1252.13	32.69	85.95	574.77	114.38	1539.03	298.59	150.92	175.67	32.10	49.49	67.82	789.91	345.31	1249.31	131.21
	N	39	39	39	39	39	39	39	39	39	39	39	39	35	39	39	39
	MAX	1360.00	50.00	92.73	646.00	125.00	1645.00	350.00	162.00	184.00	37.00	54.00	76.00	887.00	373.00	1348.00	140.00
	MIN	1148.00	21.00	80.66	520.00	104.00	1431.00	260.00	143.00	164.00	26.00	43.00	60.00	693.00	320.00	1154.00	123.00
	STD	50.01	6.83	3.00	35.08	4.88	51.88	18.11	5.18	4.99	2.16	3.19	3.76	43.38	13.73	47.55	3.88
2063	AVG	1258.41	31.88	85.37	581.97	111.00	1542.95	290.49	149.74	175.53	31.78	48.88	65.05	794.80	346.03	1253.12	130.38
	N	73	73	73	73	73	73	73	73	73	73	73	73	59	73	73	73
	MAX	1350.00	48.00	93.57	652.00	122.00	1628.00	328.00	162.00	188.00	36.00	55.00	73.00	867.00	392.00	1334.00	143.00
	MIN	1137.00	20.00	76.50	530.00	100.00	1409.00	250.00	139.00	160.00	29.00	40.00	57.00	680.00	303.00	1145.00	120.00
	STD	47.97	7.64	3.25	26.09	4.86	52.22	16.70	4.87	5.94	1.79	3.20	3.82	42.12	17.69	45.72	5.05
2064	AVG	1250.66	29.61	85.72	572.89	110.43	1537.02	292.62	151.98	177.39	31.89	47.11	64.36	779.59	335.27	1248.05	131.59
	N	56	56	56	56	56	56	55	56	56	56	56	56	44	56	56	56
	MAX	1375.00	43.00	91.18	637.00	127.00	1669.00	330.00	160.00	190.00	38.00	55.00	73.00	891.00	367.00	1368.00	143.00
	MIN	1140.00	20.00	64.64	507.00	100.00	1421.00	255.00	117.00	165.00	27.00	41.00	57.00	672.00	300.00	1130.00	123.00
	STD	53.16	6.88	3.70	29.40	6.00	56.07	16.99	6.21	5.18	2.33	2.85	3.54	43.20	15.06	52.28	4.56
2065	AVG	1275.28	30.20	86.87	579.97	110.97	1569.82	294.97	152.60	175.75	32.07	48.77	65.18	807.92	340.75	1275.82	131.20
	N	60	60	60	60	60	60	60	60	60	60	60	60	50	60	60	60
	MAX	1387.00	47.00	95.24	642.00	124.00	1654.00	340.00	165.00	189.00	37.00	55.00	75.00	858.00	393.00	1349.00	143.00
	MIN	1175.00	20.00	76.22	525.00	98.00	1448.00	260.00	138.00	160.00	26.00	42.00	56.00	730.00	303.00	1180.00	120.00
	STD	45.21	7.37	3.72	28.95	5.28	45.30	19.44	6.05	4.99	2.24	3.07	4.58	30.75	18.56	39.10	5.33
2066	AVG	1251.19	31.28	86.30	578.28	109.38	1540.03	289.29	151.93	176.19	31.52	49.87	66.14	799.50	345.39	1249.94	131.83
	N	69	69	69	69	69	69	69	69	69	69	69	69	60	69	68	69
	MAX	1395.00	49.00	92.49	673.00	119.00	1677.00	322.00	163.00	192.00	40.00	58.00	73.00	894.00	382.00	1364.00	143.00
	MIN	1145.00	20.00	79.44	516.00	97.00	1417.00	260.00	140.00	165.00	27.00	43.00	54.00	715.00	313.00	1146.00	125.00
	STD	48.24	8.17	3.20	30.28	4.85	48.72	14.90	4.48	6.08	2.44	2.81	3.67	36.76	16.54	42.94	4.23
2067	AVG	1258.85	32.69	85.31	581.85	109.29	1543.32	292.91	150.22	176.24	32.31	48.41	64.95	792.77	341.66	1257.92	130.97
	N	59	59	59	59	59	59	58	59	59	59	59	59	47	59	59	59
	MAX	1348.00	48.00	93.25	640.00	123.00	1621.00	340.00	160.00	191.00	43.00	54.00	75.00	845.00	370.00	1333.00	143.00
	MIN	1179.00	18.00	77.66	510.00	100.00	1471.00	253.00	144.00	163.00	27.00	40.00	54.00	725.00	310.00	1185.00	120.00
	STD	41.52	8.25	2.89	28.24	5.21	43.21	18.11	3.48	6.04	2.33	3.06	4.01	29.69	13.43	40.43	4.89
2068	AVG	1274.72	30.44	87.20	587.16	110.78	1560.96	291.90	153.04	175.66	32.62	48.44	63.94	804.35	344.58	1271.40	132.42
	N	50	50	50	50	50	50	50	50	50	50	50	50	46	50	50	50
	MAX	1379.00	49.00	94.77	670.00	120.00	1673.00	341.00	163.00	186.00	39.00	55.00	71.00	907.00	378.00	1372.00	143.00
	MIN	1196.00	20.00	78.14	531.00	100.00	1456.00	250.00	143.00	160.00	29.00	38.00	55.00	741.00	312.00	1177.00	124.00
	STD	44.96	7.76	3.63	30.10	4.69	51.67	15.81	4.82	5.75	1.96	3.44	3.92	38.61	15.74	47.53	4.84
2069	AVG	1270.92	29.80	85.09	574.36	109.93	1559.85	288.71	152.98	179.87	32.43	47.44	63.07	785.94	341.15	1268.03	133.31
	N	61	61	61	61	61	61	59	61	61	61	61	61	47	61	61	61
	MAX	1370.00	47.00	93.60	627.00	120.00	1676.00	330.00	163.00	191.00	37.00	55.00	71.00	884.00	384.00	1382.00	153.00
	MIN	1190.00	19.00	77.30	513.00	96.00	1476.00	243.00	143.00	161.00	30.00	41.00	54.00	720.00	300.00	1190.00	121.00

Table A-10 (Continued)

ID	STAT	ACH	AGE	CEI	DAH	FAH	HGT	ICB	MCB	MCL	NAB	NAL	NPH	PUH	SHB	STH	ZYB
	STD	43.55	7.26	2.74	26.77	5.00	47.23	21.99	5.22	5.77	1.69	2.87	3.44	34.08	15.80	43.58	5.55
2070	AVG	1239.91	33.15	86.05	562.09	109.50	1530.53	291.76	150.38	174.94	32.53	47.97	63.85	791.69	336.41	1240.71	129.68
	N	34	34	34	34	34	34	34	34	34	34	34	34	26	34	34	34
	MAX	1343.00	49.00	96.32	661.00	121.00	1653.00	327.00	164.00	190.00	42.00	54.00	78.00	864.00	370.00	1344.00	140.00
	MIN	1137.00	20.00	79.66	525.00	101.00	1415.00	250.00	140.00	161.00	29.00	41.00	54.00	720.00	293.00	1144.00	121.00
	STD	50.31	7.20	4.21	32.55	5.05	55.71	18.84	5.84	6.55	2.80	3.28	4.70	38.98	16.88	48.08	4.57
2071	AVG	1276.12	31.91	87.24	585.83	109.83	1567.03	292.40	153.54	176.15	31.31	47.88	63.65	807.42	338.22	1274.43	132.15
	N	65	65	65	65	65	65	65	65	65	65	65	65	55	65	65	65
	MAX	1392.00	50.00	94.61	664.00	123.00	1696.00	340.00	165.00	191.00	35.00	53.00	71.00	920.00	390.00	1385.00	142.00
	MIN	1175.00	18.00	80.65	507.00	101.00	1470.00	237.00	141.00	161.00	27.00	42.00	54.00	739.00	307.00	1184.00	123.00
	STD	54.70	8.07	3.45	30.28	4.72	56.70	22.15	4.55	5.81	1.84	2.64	3.13	41.96	15.66	50.09	4.09
2072	AVG	1273.57	33.10	86.34	573.87	111.58	1566.15	298.33	152.95	177.25	32.03	49.77	65.23	818.69	345.20	1275.07	133.52
	N	60	60	60	60	60	60	60	60	60	60	60	60	48	60	60	60
	MAX	1405.00	49.00	92.86	656.00	126.00	1683.00	350.00	165.00	190.00	38.00	58.00	78.00	914.00	381.00	1380.00	147.00
	MIN	1157.00	20.00	80.00	507.00	98.00	1425.00	263.00	144.00	165.00	26.00	44.00	56.00	733.00	300.00	1161.00	124.00
	STD	53.08	8.54	2.91	32.17	5.29	57.32	19.95	4.28	5.00	2.66	3.40	4.45	42.88	17.80	49.55	4.85
2073	AVG	1239.45	29.98	87.18	564.63	111.33	1528.80	287.15	150.95	173.28	31.60	48.35	65.80	796.49	338.00	1242.75	128.25
	N	40	40	40	40	40	40	40	40	40	40	40	40	39	40	40	40
	MAX	1343.00	48.00	96.30	642.00	123.00	1637.00	320.00	161.00	191.00	39.00	56.00	76.00	862.00	393.00	1327.00	140.00
	MIN	1134.00	20.00	80.23	458.00	101.00	1417.00	233.00	138.00	161.00	25.00	42.00	57.00	695.00	307.00	1142.00	120.00
	STD	49.83	7.75	3.20	31.40	5.48	55.15	17.77	4.81	5.73	2.58	2.98	3.96	45.32	17.09	49.20	4.98
2074	AVG	1271.41	29.95	86.17	582.18	112.92	1563.62	298.00	150.62	174.82	32.13	50.38	66.41	812.63	350.21	1270.05	131.90
	N	39	39	39	39	39	39	37	39	39	39	39	39	35	39	39	39
	MAX	1377.00	48.00	92.35	634.00	132.00	1696.00	340.00	160.00	182.00	36.00	57.00	80.00	916.00	400.00	1374.00	142.00
	MIN	1174.00	20.00	80.77	527.00	103.00	1443.00	273.00	140.00	168.00	30.00	44.00	56.00	745.00	318.00	1164.00	123.00
	STD	42.63	7.77	2.87	24.59	5.72	55.11	15.30	4.97	3.52	1.59	2.98	4.69	31.62	16.87	42.32	4.70
2075	AVG	1274.98	37.94	85.58	585.75	111.23	1560.04	299.76	152.52	178.33	32.85	47.31	63.27	801.68	339.40	1271.94	132.48
	N	48	48	48	48	48	48	46	48	48	48	48	48	37	48	48	48
	MAX	1362.00	52.00	95.21	647.00	124.00	1666.00	338.00	161.00	190.00	39.00	53.00	73.00	864.00	390.00	1380.00	144.00
	MIN	1175.00	22.00	68.79	533.00	98.00	1437.00	263.00	119.00	165.00	26.00	38.00	54.00	737.00	310.00	1153.00	120.00
	STD	41.30	7.80	4.11	25.99	5.53	45.51	18.38	6.56	5.48	2.28	3.29	4.39	32.65	14.78	44.32	5.12
2077	AVG	1238.61	30.96	84.79	566.86	109.30	1524.70	294.04	148.79	175.56	32.23	47.51	64.23	793.69	351.60	1236.84	130.47
	N	57	57	57	57	57	57	57	57	57	56	57	57	48	57	57	57
	MAX	1366.00	49.00	92.02	636.00	121.00	1650.00	330.00	158.00	190.00	38.00	55.00	72.00	889.00	387.00	1353.00	139.00
	MIN	1147.00	20.00	78.57	498.00	97.00	1423.00	258.00	132.00	163.00	27.00	34.00	51.00	741.00	301.00	1138.00	117.00
	STD	45.81	6.96	3.05	30.18	5.83	48.50	17.71	5.08	5.27	1.89	4.04	4.37	36.79	15.19	44.30	5.34
2078	AVG	1258.07	32.19	86.74	568.74	114.85	1545.07	295.49	152.08	175.54	31.27	50.46	68.34	810.57	345.78	1255.47	131.85
	N	59	59	59	58	59	59	59	59	59	59	59	59	49	59	59	59
	MAX	1340.00	50.00	99.37	650.00	132.00	1641.00	333.00	165.00	193.00	35.00	60.00	84.00	932.00	387.00	1328.00	141.00
	MIN	1163.00	20.00	76.17	508.00	100.00	1413.00	256.00	143.00	158.00	25.00	40.00	60.00	665.00	319.00	1163.00	121.00
	STD	44.75	7.32	3.80	32.29	5.44	52.62	17.28	4.29	6.20	1.90	3.64	4.91	44.54	13.92	41.46	4.41
2079	AVG	1254.92	31.54	85.55	572.48	109.29	1540.40	290.03	150.45	175.97	31.74	47.09	62.74	784.21	332.60	1253.37	130.06
	N	120	121	121	120	121	121	117	121	121	121	121	121	91	121	120	121
	MAX	1357.00	48.00	94.55	658.00	125.00	1641.00	340.00	161.00	192.00	42.00	62.00	80.00	850.00	371.00	1359.00	141.00
	MIN	1144.00	20.00	79.01	493.00	97.00	1426.00	253.00	140.00	164.00	27.00	37.00	51.00	687.00	301.00	1147.00	119.00
	STD	42.63	6.85	2.84	28.69	5.56	45.89	16.74	4.47	5.42	2.20	3.46	4.28	34.09	14.92	39.84	4.80
2080	AVG	1276.07	33.79	85.95	585.57	113.79	1560.22	298.59	150.37	175.06	31.47	49.38	66.56	795.00	350.57	1272.41	131.32
	N	68	68	68	68	68	68	66	68	68	68	68	68	53	68	68	68
	MAX	1376.00	50.00	96.79	644.00	127.00	1671.00	340.00	162.00	185.00	36.00	62.00	76.00	910.00	380.00	1385.00	145.00
	MIN	1148.00	20.00	77.78	490.00	103.00	1420.00	250.00	140.00	156.00	28.00	44.00	57.00	643.00	314.00	1162.00	120.00
	STD	48.10	8.66	3.34	31.40	5.14	49.65	20.14	5.15	5.44	2.02	3.39	4.14	49.99	13.74	44.56	5.77
2081	AVG	1256.62	32.81	86.12	573.26	114.81	1543.89	297.11	152.11	176.66	32.32	49.57	67.64	776.61	351.09	1252.43	130.28
	N	47	47	47	47	47	47	47	47	47	47	47	47	31	47	47	47
	MAX	1410.00	47.00	93.64	639.00	138.00	1710.00	348.00	171.00	190.00	39.00	58.00	77.00	843.00	387.00	1401.00	148.00
	MIN	1087.00	20.00	80.68	510.00	103.00	1383.00	240.00	139.00	164.00	27.00	43.00	60.00	660.00	303.00	1103.00	119.00
	STD	61.51	7.91	2.82	32.74	6.46	65.00	22.32	5.97	5.58	2.51	3.97	4.44	43.12	18.41	57.41	6.53

Table A-10 (Continued)

ID	STAT	ACH	AGE	CEI	DAH	FAH	HGT	ICB	MCB	MCL	NAB	NAL	NPH	PUH	SHB	STH	ZYB
2082	AVG	1273.61	31.63	86.39	576.45	111.50	1567.34	291.81	152.31	176.41	32.36	49.33	65.53	820.44	341.47	1273.38	130.78
	N	64	64	64	64	64	64	64	64	64	64	64	64	50	64	64	64
	MAX	1395.00	46.00	94.71	636.00	127.00	1688.00	330.00	165.00	187.00	39.00	60.00	76.00	920.00	377.00	1383.00	140.00
	MIN	1170.00	20.00	79.23	514.00	101.00	1460.00	252.00	142.00	165.00	28.00	41.00	57.00	736.00	310.00	1180.00	120.00
	STD	46.69	6.71	2.96	28.52	4.69	50.69	14.20	4.39	5.15	2.43	3.23	4.06	38.23	14.47	45.15	4.43
2083	AVG	1253.23	29.39	86.43	567.17	111.23	1546.02	294.43	152.70	176.80	31.53	48.13	65.52	804.00	343.72	1255.08	132.67
	N	64	64	64	64	64	63	64	64	64	64	64	64	47	64	64	64
	MAX	1370.00	49.00	95.15	627.00	121.00	1667.00	330.00	165.00	193.00	39.00	55.00	71.00	933.00	370.00	1352.00	147.00
	MIN	1176.00	20.00	80.21	516.00	98.00	1468.00	270.00	144.00	165.00	27.00	43.00	55.00	742.00	312.00	1180.00	123.00
	STD	42.05	6.40	2.99	24.38	4.28	43.88	15.77	4.58	5.69	2.25	2.99	3.00	36.97	14.89	39.54	4.57
2084	AVG	1266.67	25.92	85.97	586.59	111.13	1553.33	287.72	151.48	176.30	32.05	48.75	66.46	802.94	345.90	1263.41	131.30
	N	61	61	61	61	61	60	61	61	61	61	61	61	54	61	61	61
	MAX	1394.00	46.00	93.02	658.00	121.00	1684.00	326.00	165.00	186.00	38.00	59.00	77.00	860.00	375.00	1366.00	143.00
	MIN	1154.00	18.00	79.57	492.00	95.00	1428.00	247.00	141.00	160.00	27.00	41.00	56.00	730.00	303.00	1156.00	122.00
	STD	45.96	7.18	3.05	33.59	4.95	49.90	15.60	4.94	5.41	1.91	3.39	4.23	32.05	15.35	44.61	4.82
2085	AVG	1266.79	31.79	86.73	582.55	114.16	1553.55	294.96	151.98	175.32	31.95	48.98	67.04	799.69	350.18	1262.38	130.05
	N	56	56	56	56	56	56	56	56	56	56	56	56	49	56	56	56
	MAX	1348.00	46.00	94.80	650.00	126.00	1653.00	327.00	166.00	183.00	39.00	56.00	77.00	863.00	380.00	1345.00	141.00
	MIN	1090.00	20.00	81.50	482.00	105.00	1362.00	265.00	141.00	164.00	28.00	42.00	60.00	730.00	290.00	1079.00	119.00
	STD	46.70	7.58	3.34	31.12	4.70	49.27	16.72	5.65	5.03	2.06	3.37	4.30	31.01	15.43	46.36	5.33
2086	AVG	1274.05	32.31	87.10	580.64	110.02	1560.74	293.98	152.64	175.33	31.12	47.91	63.86	819.12	337.98	1272.00	132.24
	N	58	58	58	58	58	56	58	58	58	58	58	58	43	58	58	58
	MAX	1378.00	47.00	96.25	646.00	120.00	1687.00	334.00	161.00	183.00	35.00	55.00	74.00	930.00	370.00	1393.00	146.00
	MIN	1191.00	20.00	81.77	528.00	98.00	1467.00	270.00	145.00	160.00	28.00	42.00	52.00	745.00	304.00	1187.00	122.00
	STD	43.37	8.34	2.63	27.88	5.11	44.39	16.55	3.77	4.47	1.72	2.90	4.41	35.85	16.83	39.21	4.82
2087	AVG	1276.08	34.19	86.91	596.53	113.30	1560.13	294.98	153.36	176.57	31.85	49.42	65.94	809.16	347.70	1270.64	133.62
	N	53	53	53	53	53	53	53	53	53	53	53	53	31	53	53	53
	MAX	1370.00	48.00	93.33	647.00	128.00	1670.00	335.00	164.00	187.00	36.00	57.00	76.00	896.00	378.00	1365.00	142.00
	MIN	1190.00	22.00	80.33	541.00	102.00	1457.00	265.00	146.00	165.00	29.00	44.00	57.00	738.00	300.00	1177.00	122.00
	STD	43.66	6.24	2.83	23.10	5.93	47.61	17.34	3.75	4.99	1.84	3.09	3.90	38.18	16.45	41.18	4.48
2088	AVG	1249.37	31.63	85.22	562.53	112.71	1534.58	287.65	150.42	176.63	32.29	48.68	65.05	790.14	332.34	1243.42	128.71
	N	38	38	38	38	38	37	38	38	38	38	38	38	28	38	38	38
	MAX	1340.00	46.00	90.59	639.00	122.00	1612.00	316.00	161.00	187.00	35.00	55.00	74.00	837.00	353.00	1324.00	135.00
	MIN	1168.00	20.00	76.63	513.00	99.00	1460.00	260.00	141.00	167.00	28.00	43.00	57.00	746.00	303.00	1165.00	120.00
	STD	39.59	7.83	3.10	32.59	5.28	39.89	13.44	4.43	5.26	1.75	2.81	4.13	25.97	13.74	39.15	3.90
2089	AVG	1271.83	29.83	85.88	588.42	111.63	1557.67	290.85	149.54	174.25	32.10	47.81	64.79	803.05	350.19	1268.21	131.60
	N	52	52	52	52	52	52	52	52	52	52	52	52	43	52	52	52
	MAX	1368.00	44.00	93.57	651.00	122.00	1667.00	330.00	160.00	184.00	36.00	55.00	73.00	908.00	393.00	1374.00	141.00
	MIN	1198.00	20.00	79.33	536.00	100.00	1471.00	262.00	142.00	161.00	29.00	44.00	51.00	726.00	323.00	1195.00	122.00
	STD	42.82	6.80	3.22	25.13	4.64	47.72	13.74	4.66	5.27	1.62	2.88	4.19	37.82	15.99	40.13	5.15
2090	AVG	1254.50	33.09	85.85	579.67	109.33	1538.50	296.39	150.78	175.74	32.17	47.98	65.50	794.73	344.41	1252.91	131.28
	N	46	46	46	46	46	46	46	46	46	46	46	46	44	46	46	46
	MAX	1352.00	49.00	93.87	622.00	122.00	1651.00	333.00	162.00	187.00	39.00	52.00	75.00	861.00	385.00	1345.00	141.00
	MIN	1133.00	20.00	80.23	509.00	92.00	1442.00	270.00	138.00	163.00	30.00	43.00	55.00	710.00	305.00	1162.00	119.00
	STD	46.17	8.45	2.86	26.34	5.60	48.92	15.41	4.38	5.51	1.95	2.89	4.00	35.71	13.54	41.92	4.06
2091	AVG	1260.20	31.20	86.12	578.40	109.83	1545.41	293.75	150.14	174.41	31.51	48.85	65.09	801.14	347.37	1255.90	130.37
	N	87	87	87	87	87	87	87	87	87	87	87	87	76	87	87	87
	MAX	1387.00	47.00	92.78	670.00	126.00	1667.00	350.00	167.00	191.00	38.00	61.00	78.00	873.00	390.00	1365.00	145.00
	MIN	1165.00	20.00	79.06	524.00	100.00	1440.00	255.00	137.00	161.00	27.00	42.00	53.00	731.00	312.00	1151.00	119.00
	STD	39.87	6.60	2.98	25.61	5.01	42.64	16.66	5.27	5.46	2.26	3.43	4.19	29.28	15.59	39.74	5.22
2092	AVG	1254.79	31.73	86.21	569.27	110.87	1544.75	292.78	152.19	176.61	31.46	48.78	65.75	793.88	341.33	1254.36	131.64
	N	67	67	67	66	67	67	67	67	67	67	67	67	57	67	67	67
	MAX	1373.00	47.00	92.66	629.00	124.00	1670.00	350.00	164.00	187.00	36.00	56.00	73.00	880.00	397.00	1378.00	140.00
	MIN	1154.00	21.00	81.22	505.00	96.00	1443.00	260.00	142.00	166.00	26.00	41.00	58.00	724.00	290.00	1159.00	121.00
	STD	47.34	7.01	2.45	27.86	5.80	50.78	17.23	4.01	4.68	2.36	3.32	3.89	39.96	18.32	45.58	4.49
2093	AVG	1272.00	30.80	85.64	578.06	111.80	1560.80	294.91	153.00	178.80	32.03	47.31	64.23	801.83	342.29	1271.49	133.06

Table A-10 (Continued)

ID	STAT	ACH	AGE	CEI	DAH	FAH	HGT	ICB	MCB	MCL	NAB	NAL	NPH	PUH	SHB	STH	ZYB
	N	35	35	35	35	35	35	35	35	35	35	35	35	30	35	35	35
	MAX	1343.00	47.00	95.09	624.00	121.00	1658.00	333.00	165.00	190.00	36.00	53.00	78.00	878.00	371.00	1340.00	145.00
	MIN	1161.00	20.00	78.69	516.00	98.00	1414.00	256.00	144.00	163.00	27.00	41.00	55.00	746.00	297.00	1144.00	124.00
	STD	40.68	7.75	3.28	23.09	5.48	50.56	15.94	4.68	6.32	2.02	3.38	5.17	33.11	16.46	42.40	5.26
2094	AVG	1268.54	31.46	86.52	591.07	115.10	1560.27	293.80	151.83	175.58	31.12	51.66	69.53	800.10	347.61	1269.03	131.36
	N	59	59	59	59	59	59	59	59	59	59	59	59	51	59	59	59
	MAX	1364.00	46.00	94.92	660.00	126.00	1672.00	360.00	172.00	188.00	36.00	60.00	75.00	867.00	385.00	1364.00	150.00
	MIN	1171.00	20.00	76.60	538.00	102.00	1446.00	253.00	140.00	165.00	27.00	45.00	60.00	722.00	320.00	1167.00	120.00
	STD	48.58	7.11	3.30	26.58	4.84	51.50	18.71	5.55	5.21	1.98	2.84	3.15	37.34	15.19	47.46	5.83
2095	AVG	1256.96	33.12	85.77	569.39	112.39	1548.63	295.07	151.78	177.01	32.58	49.48	66.04	804.86	344.07	1259.28	132.16
	N	67	67	67	67	67	67	67	67	67	67	67	67	59	67	67	67
	MAX	1366.00	51.00	95.24	626.00	124.00	1659.00	370.00	171.00	190.00	43.00	56.00	73.00	881.00	390.00	1352.00	143.00
	MIN	1160.00	20.00	81.22	512.00	96.00	1439.00	262.00	142.00	163.00	26.00	41.00	55.00	728.00	316.00	1171.00	118.00
	STD	47.73	8.53	2.84	27.37	5.76	51.73	18.55	5.49	5.47	2.51	3.17	4.07	34.35	17.75	44.45	4.91
2096	AVG	1265.97	34.39	86.53	582.07	114.07	1555.00	292.58	152.54	176.42	31.56	50.49	68.75	802.51	349.90	1261.42	134.14
	N	59	59	59	59	59	59	59	59	59	59	59	59	51	59	59	59
	MAX	1357.00	57.00	93.90	652.00	128.00	1661.00	340.00	162.00	188.00	35.00	60.00	80.00	895.00	380.00	1360.00	145.00
	MIN	1130.00	20.00	79.46	503.00	103.00	1406.00	245.00	145.00	163.00	28.00	42.00	60.00	707.00	303.00	1137.00	125.00
	STD	46.15	9.22	2.87	31.48	6.16	47.79	17.41	3.62	5.40	1.70	3.96	4.61	33.84	15.05	41.51	4.30
2097	AVG	1268.72	30.63	85.52	587.30	110.61	1561.05	293.08	151.22	176.95	32.22	49.38	65.73	808.26	336.92	1271.34	133.02
	N	64	64	64	64	64	64	64	64	64	64	64	64	54	64	64	64
	MAX	1406.00	48.00	92.02	660.00	122.00	1716.00	348.00	161.00	189.00	38.00	58.00	76.00	913.00	370.00	1396.00	143.00
	MIN	1143.00	18.00	77.78	517.00	100.00	1425.00	216.00	140.00	163.00	27.00	41.00	55.00	726.00	303.00	1137.00	121.00
	STD	54.75	9.61	3.16	30.58	4.79	57.72	24.08	4.63	5.97	2.47	2.86	4.08	40.73	16.59	52.19	5.17
2098	AVG	1242.69	32.44	85.12	563.93	110.18	1529.53	296.07	151.71	178.31	32.04	47.16	63.20	778.77	334.42	1243.62	131.58
	N	45	45	45	45	45	45	42	45	45	45	45	45	31	45	45	45
	MAX	1308.00	47.00	92.90	628.00	123.00	1626.00	350.00	161.00	186.00	43.00	54.00	70.00	834.00	372.00	1334.00	143.00
	MIN	1151.00	20.00	79.89	521.00	98.00	1434.00	270.00	143.00	169.00	27.00	40.00	53.00	710.00	292.00	1154.00	120.00
	STD	35.43	8.09	2.65	24.21	5.39	39.94	13.92	3.44	4.00	2.82	3.17	3.45	27.48	15.69	35.22	5.33
2099	AVG	1260.95	30.38	85.64	576.48	116.44	1548.09	298.80	151.36	176.89	31.86	51.29	68.24	794.95	346.61	1257.70	133.61
	N	66	66	66	66	66	66	66	66	66	66	66	66	62	66	66	66
	MAX	1360.00	45.00	94.77	639.00	134.00	1651.00	330.00	163.00	188.00	39.00	58.00	77.00	858.00	386.00	1352.00	146.00
	MIN	1153.00	21.00	78.14	525.00	105.00	1420.00	262.00	137.00	166.00	28.00	41.00	56.00	698.00	317.00	1144.00	123.00
	STD	36.45	5.35	3.57	25.48	5.20	38.07	13.95	4.74	5.26	2.31	3.49	4.76	29.82	16.67	33.61	5.44
2100	AVG	1252.84	32.98	85.28	578.50	113.07	1537.84	295.31	150.52	176.59	33.07	48.79	67.29	797.10	344.62	1248.71	129.29
	N	58	58	58	58	58	58	58	58	58	58	58	58	52	58	58	58
	MAX	1375.00	46.00	93.21	640.00	128.00	1660.00	337.00	162.00	186.00	38.00	57.00	76.00	858.00	380.00	1368.00	138.00
	MIN	1164.00	20.00	79.21	521.00	98.00	1443.00	260.00	141.00	162.00	29.00	40.00	52.00	726.00	312.00	1160.00	120.00
	STD	45.17	7.10	2.99	27.91	6.17	50.00	16.53	4.83	5.37	1.95	3.75	4.78	31.31	15.98	44.32	4.17
2101	AVG	1273.50	31.23	84.73	588.53	111.18	1558.38	295.33	150.58	177.78	31.85	50.10	65.98	798.76	343.80	1270.38	131.45
	N	40	40	40	40	40	40	40	40	40	40	40	40	33	40	40	40
	MAX	1388.00	47.00	89.29	636.00	121.00	1685.00	350.00	157.00	190.00	36.00	64.00	75.00	877.00	382.00	1379.00	139.00
	MIN	1144.00	18.00	79.89	518.00	100.00	1446.00	260.00	143.00	166.00	27.00	43.00	60.00	728.00	305.00	1166.00	120.00
	STD	51.40	7.97	2.17	27.07	5.15	53.46	19.50	3.70	5.03	1.96	4.03	3.96	44.13	18.76	47.45	5.19
2102	AVG	1257.86	28.84	86.95	576.30	111.54	1543.49	290.30	152.49	175.49	31.59	48.11	64.32	799.95	336.08	1249.97	130.54
	N	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37
	MAX	1356.00	45.00	98.26	648.00	128.00	1645.00	321.00	169.00	183.00	35.00	58.00	71.00	873.00	365.00	1350.00	151.00
	MIN	1159.00	21.00	81.32	523.00	102.00	1440.00	260.00	143.00	166.00	28.00	44.00	57.00	720.00	320.00	1152.00	121.00
	STD	47.71	6.65	3.64	29.13	5.20	48.85	14.26	4.69	4.49	1.67	3.20	3.54	34.71	11.78	43.79	5.27
Total	AVG	1262.26	32.02	86.01	577.70	111.67	1550.34	293.57	151.55	176.31	31.99	48.85	65.67	799.73	342.95	1260.48	131.46
	COUNT	5344.00	5348.00	5348.00	5340.00	5348.00	5348.00	5281.00	5348.00	5348.00	5347.00	5348.00	5348.00	4313.00	5347.00	5342.00	5348.00
	MAX	1420.00	73.00	101.29	696.00	140.00	1721.00	370.00	172.00	200.00	43.00	64.00	86.00	970.00	400.00	1432.00	153.00
	MIN	1081.00	18.00	53.76	407.00	92.00	1297.00	200.00	100.00	155.00	21.00	34.00	50.00	544.00	243.00	1074.00	116.00
	STD	46.50	8.08	3.17	30.18	5.59	50.04	17.48	4.89	5.57	2.18	3.35	4.39	37.93	16.73	44.61	5.00

Table A- 11. Summary Statistics for Females from Mazury (Miskiewicz, 1956).

<i>ID</i>	<i>STAT</i>	<i>AGE</i>	<i>BIB</i>	<i>CEI</i>	<i>CMB</i>	<i>FAH</i>	<i>HGT</i>	<i>MCB</i>	<i>MCL</i>	<i>NAB</i>	<i>NAL</i>	<i>NPH</i>	<i>WFB</i>	<i>YOB</i>	<i>ZYB</i>
3	AVG	34.21	103.35	82.67	126.55	112.97	1604.39	150.09	181.68	31.72	51.66	71.2	105.37	1919.79	134.74
	N	189	189	189	188	189	173	189	189	189	189	189	189	189	189
	MAX	93	120	91.33	141	131	1740	166	200	40	67	82	118	1936	152
	MIN	18	88	75.69	106	96	1450	135	164	26	42	60	93	1861	121
	STD	18.99	5.54	3.34	5.85	6.39	57.24	5.51	6.01	2.34	3.97	4.48	4.57	18.99	5.38
4	AVG	40.28	104.92	82.65	126.49	112.34	1581.64	151.45	183.31	32.18	51.7	69.92	107.8	1913.9	134.34
	N	123	123	123	92	123	116	123	123	123	123	123	123	123	123
	MAX	88	120	89.44	144	130	1710	166	198	38	63	84	125	1937	149
	MIN	18	92	73.68	109	98	1350	139	168	26	41	57	92	1866	115
	STD	20.6	6.51	2.86	6.14	6.44	69.34	5.77	6.1	2.39	4.26	5.3	6.21	20.54	5.69
5	AVG	47.05	105	83.28	126.94	112.6	1597.47	151.65	182.2	32.35	52.85	71.8	106.47	1906.95	137
	N	20	19	20	18	20	15	20	20	20	20	20	19	20	20
	MAX	80	113	90.18	137	126	1730	163	191	39	67	81	114	1935	148
	MIN	19	95	76.14	108	94	1480	134	163	26	47	61	99	1874	120
	STD	20.62	4.69	3.65	8.23	7.12	61.22	7.09	6.83	3.28	5.09	5.31	4.38	20.62	6.14
6	AVG	44	103.16	83.07	127.28	112.19	1612.4	151.41	182.38	31.97	51.38	71.28	105.63	1910	136.22
	N	32	32	32	32	32	25	32	32	32	32	32	32	32	32
	MAX	90	113	88.95	140	123	1710	164	195	36	60	79	114	1936	148
	MIN	18	92	77.08	112	102	1430	142	168	27	45	62	98	1864	125
	STD	23.85	5.19	3.18	5.87	5.67	67.16	5.56	6.37	2.19	3.77	3.84	4.09	23.85	5.42
7	AVG	48.65	105.92	83.26	125.85	114.96	1577.37	150.38	180.81	31.88	51.5	71.77	106.08	1905.35	136.19
	N	26	26	26	26	26	19	26	26	26	26	26	26	26	26
	MAX	86	120	96.08	142	126	1710	164	193	37	65	85	116	1934	147
	MIN	20	95	77.13	117	102	1500	137	153	27	40	62	95	1868	123
	STD	21.87	5.44	3.74	5.55	6.88	60.54	6.43	7.91	2.78	5.16	5.07	5.34	21.87	6.16
8	AVG	50.25	107.08	82.97	127.91	114.33	1557	153.92	185.67	32.75	52.67	71.42	107.33	1903.75	138.25
	N	12	12	12	11	12	10	12	12	12	12	12	12	12	12
	MAX	80	118	90	143	125	1630	162	198	39	59	79	112	1936	146
	MIN	18	96	78.72	118	106	1490	147	177	29	46	62	102	1874	132
	STD	24.05	6.33	3.4	7.58	6.1	52.72	4.83	6.26	2.6	3.77	5.2	3.2	24.05	4.54
9	AVG	43.89	102.79	83.61	126.95	114	1578.57	152.05	182	31.74	51.84	71.63	106.89	1910.11	135
	N	19	19	19	19	19	14	19	19	19	19	19	19	19	19
	MAX	83	110	91.57	140	125	1680	159	188	37	62	79	113	1936	144
	MIN	18	94	76.76	118	104	1480	142	166	28	46	61	100	1871	124
	STD	23.71	4.5	3.44	4.82	4.89	57.36	5.48	6.62	2.66	4.14	4.13	4.18	23.71	5.58
10	AVG	60.73	106.25	82.52	126.75	113.27	1566.88	149.53	181.33	32.73	51.6	73.6	102	1893.27	136.2
	N	15	12	15	12	15	8	15	15	15	15	15	12	15	15
	MAX	85	121	87.5	137	124	1682	161	193	37	59	81	106	1931	145
	MIN	23	94	77.66	122	100	1490	144	172	24	45	64	96	1869	127
	STD	21.18	8.35	3.01	5.33	7.19	55.95	4.7	5.74	3.49	3.94	5.68	3.72	21.18	4.54

Table A-11 (Continued)

<i>ID</i>	<i>STAT</i>	<i>AGE</i>	<i>BIB</i>	<i>CEI</i>	<i>CMB</i>	<i>FAH</i>	<i>HGT</i>	<i>MCB</i>	<i>MCL</i>	<i>NAB</i>	<i>NAL</i>	<i>NPH</i>	<i>WFB</i>	<i>YOB</i>	<i>ZYB</i>
11	AVG	49.41	104.06	82.53	125.31	113.45	1585.94	150.91	182.91	33.18	50.82	71.14	105	1904.59	134.18
	N	22	16	22	16	22	16	22	22	22	22	22	16	22	22
	MAX	82	114	87.93	133	128	1670	163	191	37	60	82	114	1933	143
	MIN	21	94	77.6	118	96	1500	142	174	28	43	59	98	1872	125
	STD	23.28	6.8	3.17	3.63	7.69	41.95	5.36	4.09	2.72	5.06	5.58	4.79	23.28	5.4
12	AVG	33.81	102.5	82.53	122	115.88	1558.26	149.31	181.03	31.28	52.16	72.59	102.5	1921.13	133.56
	N	32	2	32	2	32	31	32	32	32	32	32	2	32	32
	MAX	71	103	89.89	123	124	1670	160	200	38	62	82	103	1935	144
	MIN	20	102	76.5	121	103	1465	138	167	24	44	63	102	1883	122
	STD	11.11	0.71	3.38	1.41	5.47	53.64	5.75	6.2	2.59	5.1	5	0.71	11.18	5.23
13	AVG	28		89.35		101	1415	151	169	28	44	61		1927	131
	N	1		1		1	1	1	1	1	1	1		1	1
	MAX	28		89.35		101	1415	151	169	28	44	61		1927	131
	MIN	28		89.35		101	1415	151	169	28	44	61		1927	131
	STD														
15	AVG	21		83.63		114	1529	143	171	28	53	72		1933	129
	N	1		1		1	1	1	1	1	1	1		1	1
	MAX	21		83.63		114	1529	143	171	28	53	72		1933	129
	MIN	21		83.63		114	1529	143	171	28	53	72		1933	129
	STD														
22	AVG	33	107.5	82.98	130	113.25	1574.75	151	182.25	32.25	50	71.25	106	1921.5	137
	N	4	2	4	2	4	4	4	4	4	4	4	2	4	4
	MAX	46	112	88.1	135	124	1620	157	189	33	55	83	107	1932	143
	MIN	22	103	80.33	125	101	1503	147	168	31	43	62	105	1908	132
	STD	10.68	6.36	3.64	7.07	9.98	52.26	4.55	9.91	0.96	5.29	8.73	1.41	10.75	4.69
Total	AVG	39.78	104.17	82.79	126.57	113.12	1589.84	150.72	182.17	31.97	51.69	71.1	106.14	1914.33	134.94
	N	496	452	496	418	496	433	496	496	496	496	496	452	496	496
	MAX	93	121	96.08	144	131	1740	166	200	40	67	85	125	1937	152
	MIN	18	88	73.68	106	94	1350	134	153	24	40	57	92	1861	115
	STD	20.95	5.91	3.23	5.9	6.44	62.69	5.68	6.25	2.51	4.27	4.93	5.13	20.95	5.52

Table A- 12. Summary Statistics for Females from Warmia (Miskiewicz, 1960).

ID	STAT	AGE	CEI	FAH	HGT	MCB	MCL	NAB	NAL	NPH	YOB	ZYB
10	AVG	35.38	84.32	113.13	1577.38	151.87	180.22	32.13	50.29	70.83	1918.62	135.45
	N	78	78	78	42	78	78	78	78	78	78	78
	MAX	70.00	93.14	128.00	1721.00	165.00	189.00	38.00	59.00	80.00	1936.00	149.00
	MIN	18.00	75.14	102.00	1466.00	137.00	166.00	27.00	41.00	62.00	1884.00	124.00
	STD	13.92	3.42	6.76	58.97	5.23	4.89	2.25	3.60	4.48	13.92	5.22
16	AVG	36.22	83.18	115.45	1560.67	150.83	181.48	31.85	51.74	73.11	1917.78	134.96
	N	184	184	184	120	184	184	184	184	184	184	184
	MAX	73.00	94.41	133.00	1751.00	163.00	196.00	40.00	62.00	83.00	1936.00	147.00
	MIN	18.00	75.65	100.00	1403.00	138.00	161.00	27.00	43.00	61.00	1881.00	123.00
	STD	15.43	3.14	5.94	56.43	4.86	6.08	2.41	3.76	4.54	15.43	5.01
17	AVG	37.65	83.69	114.09	1574.23	151.63	181.33	32.76	51.50	72.13	1916.35	136.11
	N	46	46	46	26	46	46	46	46	46	46	46
	MAX	74.00	91.07	126.00	1678.00	158.00	191.00	40.00	62.00	87.00	1936.00	147.00
	MIN	18.00	76.60	103.00	1451.00	137.00	168.00	28.00	45.00	63.00	1880.00	124.00
	STD	15.59	3.26	5.41	57.44	4.32	5.61	2.73	3.68	4.45	15.59	4.83
18	AVG	41.00	82.94	112.83	1565.38	149.67	180.50	32.67	51.67	71.50	1913.00	135.08
	N	12	12	12	8	12	12	12	12	12	12	12
	MAX	65.00	90.29	128.00	1645.00	158.00	193.00	39.00	60.00	80.00	1933.00	148.00
	MIN	21.00	77.78	93.00	1503.00	139.00	174.00	29.00	46.00	63.00	1889.00	119.00
	STD	16.33	3.41	8.90	49.58	6.75	5.78	2.53	4.27	5.39	16.33	7.14
19	AVG	62.50	81.87	105.00	1483.00	151.00	184.50	32.50	48.50	69.50	1891.50	137.50
	N	2	2	2	1	2	2	2	2	2	2	2
	MAX	67.00	83.52	107.00	1483.00	152.00	187.00	33.00	50.00	70.00	1896.00	138.00
	MIN	58.00	80.21	103.00	1483.00	150.00	182.00	32.00	47.00	69.00	1887.00	137.00
	STD	6.36	2.34	2.83	-	1.41	3.54	0.71	2.12	0.71	6.36	0.71
20	AVG	28.40	83.15	112.43	1586.86	150.38	180.96	31.21	50.02	70.91	1925.60	135.28
	N	102	102	102	101	102	102	102	102	102	102	102
	MAX	57.00	92.35	128.00	1764.00	160.00	192.00	39.00	59.00	82.00	1936.00	150.00
	MIN	18.00	75.94	97.00	1465.00	136.00	170.00	27.00	40.00	57.00	1897.00	119.00
	STD	11.03	3.09	6.22	52.24	4.91	5.39	2.06	3.87	4.09	11.03	5.17
TOTAL	AVG	34.60	83.42	114.02	1572.95	150.97	181.09	31.87	51.02	71.99	1919.40	135.27
	N	424	424	424	298	424	424	424	424	424	424	424
	MAX	74.00	94.41	133.00	1764.00	165.00	196.00	40.00	62.00	87.00	1936.00	150.00
	MIN	18.00	75.14	93.00	1403.00	136.00	161.00	27.00	40.00	57.00	1880.00	119.00
	STD	14.72	3.21	6.33	56.30	4.95	5.64	2.37	3.82	4.53	14.72	5.12

Table A- 13. Summary Statistics for Females from Boas' Immigrant Study (Boas, 1928).

ID	STAT	AGE	CEI	HGT	MCB	MCL	YOB	ZYB
Boas	AVG	33.73	82.50	1562.22	149.31	181.13	1876.27	135.73
	N	144	144	144	144	144	144	144
	MAX	58.00	91.33	1795.00	163.00	200.00	1892.00	148.00
	MIN	18.00	75.63	1440.00	139.00	167.00	1852.00	124.00
	STD	7.58	3.25	60.42	4.54	5.99	7.58	4.79

Males

Table A- 14. Summary Statistics for Males from IDO Subseries 1 (USHMM, 2008a).

ID	STAT	AGE	BIB	CEI	CRC	EAH	EHH	FLH	FML	FRL	HGT	IEB	MCB	MCL	NAB
100	AVG	40.04	106.43	84.36	561.52	1558.31	128.64	621.64	119.11	463.03	1613.65	33.43	157.35	186.70	36.50
	n	26	42	57	42	39	42	39	56	39	54	44	57	57	44
	MAX	78.00	122.00	91.16	593.00	1693.00	142.00	700.00	140.00	519.00	1840.00	42.00	167.00	201.00	43.00
	MIN	18.00	93.00	78.06	512.00	1400.00	120.00	544.00	102.00	415.00	1149.00	26.00	145.00	170.00	27.00
	STD	16.15	6.13	2.96	16.75	72.41	5.20	44.74	9.88	24.78	148.97	3.55	5.66	8.14	2.80
	STAT	NAB	NAL	NAL	PEB	SHB	SIH	SLH	SPA	UFH	USH	WFB	YOB	ZYB	
	AVG	36.50	54.48	54.48	288.64	367.28	865.05	1391.41	1763.51	68.71	1378.74	105.31	1899.96	139.32	
	n	44	44	44	39	40	41	39	41	41	39	42	26	56	
	MAX	43.00	64.00	64.00	339.00	408.00	925.00	1541.00	1943.00	78.00	1528.00	116.00	1922.00	152.00	
	MIN	27.00	26.00	26.00	157.00	275.00	622.00	1260.00	1195.00	60.00	1243.00	93.00	1862.00	124.00	
	STD	2.80	5.89	5.89	29.48	27.55	56.25	68.96	128.86	4.52	66.44	4.88	16.15	7.94	

Table A- 15. Summary Statistics for Males from IDO Subseries 3 & 6 (USHMM, 2008a).

ID	STAT	ACH	AGE	ARL	BIB	CEI	CRC	CRH	DAH	EHH	ESP	FAH	FML	GNH	HAB
360	AVG	1370.24	27.29	748.88	107.20	84.90	553.45	221.34	610.73	125.11	30.62	124.81	116.79	1446.35	85.14
	n	332	604	601	596	598	269	270	332	599	269	328	270	335	270
	MAX	1583.00	58.00	957.00	167.00	205.33	595.00	785.00	810.00	145.00	68.00	140.00	172.00	1669.00	182.00
	MIN	1209.00	18.00	223.00	90.00	59.14	520.00	126.00	525.00	106.00	22.00	110.00	101.00	1291.00	70.00
	STD	55.48	8.37	48.31	6.74	7.96	14.36	38.50	37.35	5.55	3.68	6.04	7.67	55.22	7.46
	STAT	HAL	HGT	IEB	LGL	MCB	MCL	NAB	NAD	NAH	NAH	NAL	NSH	OEB	
	AVG	83.80	1686.08	33.07	595.72	156.30	184.78	34.11	23.25	55.98	55.98	50.54	79.12	90.08	
	n	332	604	328	601	598	597	329	329	329	329	270	326	329	
	MAX	129.00	1902.00	41.00	958.00	194.00	204.00	59.00	77.00	70.00	70.00	62.00	93.00	110.00	
	MIN	22.00	1505.00	27.00	267.00	110.00	75.00	10.00	17.00	30.00	30.00	31.00	68.00	10.00	
	STD	14.63	63.48	2.63	254.99	6.11	9.89	3.45	3.85	4.50	4.50	4.31	4.52	7.25	
	STAT	PUH	SHB	SHD	SIH	SPA	STH	THH	TRL	ULH	WFB	WRC	YOB	ZYB	
	AVG	858.63	374.61	13.97	887.21	1761.77	1363.16	226.96	567.96	23.11	108.25	165.52	1914.15	139.25	
	n	332	602	329	269	269	335	332	332	325	598	270	604	598	
	MAX	1008.00	443.00	99.00	995.00	1960.00	1596.00	330.00	799.00	48.00	190.00	314.00	1924.00	173.00	
	MIN	725.00	232.00	0.00	758.00	1560.00	1209.00	185.00	271.00	14.00	94.00	105.00	1882.00	110.00	
	STD	42.23	22.34	12.11	35.39	74.00	53.53	15.36	39.93	3.18	5.80	12.90	8.46	5.86	

Table A- 16. Summary Statistics for Males from IDO Subseries 4 (USHMM, 2008a).

ID	STAT	AGE	BIB	CEI	CRC	CRH	EHH	ESP	FAH	FLH	GNH	HAB	HAL	HGT	ICB
400	AVG	35.28	107.97	86.07	555.35	219.69	119.00	32.10	124.75	626.00	1484.00	87.60	96.00	1683.51	212.00
	n	92	92	92	91	91	1	91	92	1	1	91	1	92	1
	MAX	62.00	130.00	103.21	605.00	242.00	119.00	40.00	149.00	626.00	1484.00	103.00	96.00	1910.00	212.00
	MIN	19.00	95.00	58.15	525.00	196.00	119.00	21.00	109.00	626.00	1484.00	56.00	96.00	1555.00	212.00
	STD	8.44	5.38	5.53	16.51	10.72	-	3.23	6.58	-	-	5.67	-	61.84	-
	STAT	ICH	IEB	LFH	LLL	MAL	MCB	MCL	MHB	NAB	NAH	NFD	NSH	OEB	PUH
	AVG	970.00	30.00	48.00	809.00	766.00	157.89	183.78	313.76	34.97	53.54	21.00	72.00	88.00	849.00
	n	1	1	1	1	1	92	92	91	92	92	1	1	1	1
	MAX	970.00	30.00	48.00	809.00	766.00	173.00	202.00	377.00	44.00	63.00	21.00	72.00	88.00	849.00
	MIN	970.00	30.00	48.00	809.00	766.00	107.00	150.00	205.00	29.00	42.00	21.00	72.00	88.00	849.00
	STD	-	-	-	-	-	8.34	8.96	21.51	2.83	4.46	-	-	-	-
	STAT	SBD	SHB	SHD	SIH	SLH	THH	THL	TRL	ULH	USH	WFB	WRC	YOB	ZYB
	AVG	221.00	372.15	4.00	885.35	1392.00	211.00	539.00	846.00	24.00	1388.00	109.14	167.89	1906.72	142.32
	n	1	92	1	91	1	1	1	1	1	1	90	92	92	92
	MAX	221.00	416.00	4.00	990.00	1392.00	211.00	539.00	846.00	24.00	1388.00	145.00	195.00	1923.00	157.00
	MIN	221.00	268.00	4.00	560.00	1392.00	211.00	539.00	846.00	24.00	1388.00	98.00	150.00	1880.00	129.00
	STD	-	22.02	-	62.05	-	-	-	-	-	-	6.05	8.07	8.44	5.33

Table A- 17. Summary Statistics for Males from IDO Subseries 7 (USHMM, 2008a), Table 1 of 2.

ID	STAT	AGE	BIB	CEI	CRH	FAH	FLH	GNH	HAL	HGT	ICB	ICH	IEB	ISB	LFH	LLL	MAL	MCB	MCL	NAB	NAH
701	AVG	37.11	108.85	84.71	123.91	123.00	606.54	1423.03	82.54	1640.68	283.88	1004.84	33.13	242.50	46.85	812.98	747.90	155.06	184.08	35.15	52.94
	n	117	119	120	120	119	114	115	110	117	112	112	119	4	113	108	111	120	120	119	118
	MAX	73.00	126.00	161.76	138.00	142.00	998.00	1570.00	110.00	1886.00	848.00	1151.00	41.00	246.00	56.00	931.00	860.00	168.00	200.00	41.00	66.00
	MIN	18.00	96.00	60.45	111.00	104.00	488.00	1248.00	59.00	1370.00	171.00	859.00	24.00	237.00	38.00	671.00	640.00	107.00	102.00	30.00	13.00
	STD	8.41	5.33	9.33	4.79	7.09	51.62	63.30	11.71	73.74	58.37	51.23	2.84	3.87	4.08	45.08	40.34	7.53	11.33	2.74	5.72
702	AVG	37.15	108.68	83.69	124.48	124.51	616.49	1440.72	81.20	1659.56	279.26	1009.12	34.34		46.59	815.47	747.48	155.58	186.26	34.81	53.13
	n	106	105	106	106	106	106	106	103	106	106	106	106		106	106	106	106	106	106	106
	MAX	51.00	120.00	120.34	143.00	142.00	841.00	1591.00	120.00	1811.00	576.00	1144.00	42.00		57.00	917.00	958.00	172.00	203.00	45.00	64.00
	MIN	19.00	94.00	61.08	112.00	102.00	454.00	995.00	46.00	1190.00	215.00	669.00	28.00		36.00	521.00	504.00	113.00	118.00	28.00	40.00
	STD	7.16	5.62	5.23	5.23	6.64	46.06	80.94	14.47	84.64	35.35	62.26	2.57		3.93	49.46	51.38	7.31	8.75	2.82	3.91
703	AVG	40.38	109.10	84.77	125.86	125.83	614.56	1431.74	82.14	1655.67	292.60	1002.47	33.52		46.95	804.33	740.41	158.35	185.62	35.68	54.63
	n	87	87	87	87	87	85	85	85	84	85	85	86		86	83	85	86	87	87	87
	MAX	80.00	124.00	122.90	140.00	147.00	770.00	1559.00	120.00	1799.00	328.00	1105.00	40.00		67.00	894.00	824.00	169.00	199.00	42.00	66.00
	MIN	18.00	93.00	8.42	116.00	104.00	495.00	1178.00	45.00	1378.00	200.00	801.00	28.00		37.00	600.00	578.00	142.00	131.00	29.00	32.00
	STD	14.24	6.09	10.63	5.37	8.25	48.04	79.94	13.56	80.81	18.91	60.62	2.64		5.23	50.04	43.99	5.36	10.29	2.87	5.92
704	AVG	36.01	109.94	86.03	125.74	124.93	623.31	1450.44		1672.09	297.45	1012.84	33.50					158.86	185.38	35.81	54.72
	n	162	162	162	161	162	161	161		161	159	159	162					162	162	162	161
	MAX	52.00	142.00	128.69	141.00	146.00	740.00	1616.00		1840.00	391.00	1146.00	40.00					177.00	208.00	43.00	68.00
	MIN	18.00	92.00	65.63	110.00	107.00	477.00	1228.00		1439.00	240.00	874.00	20.00					126.00	122.00	31.00	32.00
	STD	7.41	6.31	6.71	5.50	7.46	36.39	58.38		61.84	18.53	49.05	2.68					5.97	10.97	2.53	5.19
705	AVG	40.41	111.70	83.68	126.26	125.99	617.83	1446.28	72.40	1670.90	299.90	1022.25	34.46		47.29	836.46	759.50	157.71	187.95	36.29	55.25
	n	215	207	213	208	207	206	205	160	214	211	204	207		167	160	161	214	212	207	207
	MAX	73.00	129.00	107.75	228.00	144.00	709.00	1597.00	171.00	1831.00	358.00	1177.00	43.00		59.00	959.00	856.00	178.00	208.00	47.00	85.00
	MIN	18.00	96.00	7.80	110.00	85.00	447.00	1288.00	40.00	1489.00	198.00	629.00	27.00		35.00	700.00	662.00	137.00	142.00	25.00	25.00
	STD	13.10	5.32	6.72	11.58	8.20	37.14	53.43	15.84	59.34	21.13	50.50	2.37		4.09	36.31	35.35	5.72	7.54	3.06	5.75
706	AVG	35.74	111.38	84.69	130.79	123.13	610.84	1437.59	77.41	1659.66	299.90	1011.77	34.00		47.23	816.41	749.30	158.53	187.35	35.31	53.10
	n	197	196	197	197	197	195	196	194	197	197	196	197		196	196	196	197	197	197	197
	MAX	56.00	131.00	93.26	146.00	143.00	697.00	1605.00	112.00	1841.00	728.00	1128.00	92.00		69.00	931.00	835.00	176.00	203.00	43.00	67.00
	MIN	19.00	95.00	58.03	113.00	106.00	524.00	1237.00	46.00	1429.00	254.00	852.00	26.00		37.00	269.00	239.00	112.00	169.00	30.00	41.00
	STD	9.69	6.26	3.61	5.43	7.00	34.72	55.39	12.09	60.26	35.39	47.65	6.04		4.69	85.14	51.17	5.73	6.23	2.45	4.32
Total	AVG	37.73	110.29	84.58	126.61	124.55	615.31	1439.91	78.26	1661.75	294.16	1012.31	33.89	242.50	47.04	819.07	750.12	157.55	186.39	35.59	54.04
	n	884	876	885	879	878	867	868	652	880	869	862	877	4	668	653	659	885	884	878	876
	MAX	80.00	142.00	161.76	228.00	147.00	998.00	1616.00	171.00	1886.00	848.00	1177.00	92.00	246.00	69.00	959.00	958.00	178.00	208.00	47.00	85.00
	MIN	18.00	92.00	7.80	110.00	85.00	447.00	995.00	40.00	1190.00	171.00	629.00	20.00	237.00	35.00	269.00	239.00	107.00	102.00	25.00	13.00
	STD	10.56	5.95	6.97	7.66	7.56	41.21	63.29	14.11	68.27	33.66	52.61	3.69	3.87	4.40	60.37	45.34	6.35	9.09	2.78	5.24

Table A- 18. Summary Statistics for Males from IDO Subseries 7 (USHMM, 2008a), Table 2 of 2.

ID	STAT	NFD	NPH	NSD	NSH	OEB	PUH	RAH	SBD	SHB	SHD	SLH	SYH	THH	THL	TIH	TRL	UAL	ULH	WFB	YOB
701	AVG	22.03	72.60	-	76.08	91.63	849.20	3069.60	192.83	385.11	15.28	1352.42	775.20	219.09	489.73	464.50	792.76		23.27	107.51	1904.94
	n	118	5	121	118	116	116	5	113	113	106	116	5	111	110	4	110		113	119	117
	MAX	82.00	81.00	0.00	99.00	104.00	981.00	11125.00	278.00	586.00	46.00	1574.00	870.00	246.00	597.00	476.00	931.00		82.00	118.00	1924.00
	MIN	16.00	61.00	0.00	66.00	80.00	691.00	993.00	102.00	216.00	1.00	1166.00	573.00	124.00	386.00	449.00	689.00		14.00	96.00	1869.00
702	STD	8.17	7.23	-	4.88	4.43	49.19	4503.27	18.98	48.40	10.47	67.22	117.64	14.18	28.45	11.85	34.29		6.81	4.60	8.41
	AVG	21.56	81.00	-	77.88	92.05	852.36		203.80	384.18	11.73	1361.82		220.63	508.28		808.45		24.72	108.63	1905.17
	n	106	1	106	106	106	106		106	106	98	105		105	104		104		106	105	106
	MAX	32.00	81.00	0.00	89.00	103.00	967.00		335.00	561.00	47.00	1503.00		307.00	599.00		907.00		38.00	149.00	1924.00
703	MIN	15.00	81.00	0.00	66.00	80.00	536.00		161.00	285.00	1.00	958.00		189.00	413.00		654.00		15.00	95.00	1892.00
	STD	2.47	-	-	4.44	4.31	54.50		26.84	33.67	8.96	75.48		15.42	31.64		40.28		3.08	6.11	7.10
	AVG	21.93		-	79.41	90.18	838.95		199.31	384.89	14.24	1354.28		221.87	512.85		817.75		25.24	107.52	1901.56
	n	84		88	87	87	83		84	84	83	85		85	84		83		86	87	88
704	MAX	27.00		0.00	92.00	102.00	944.00		253.00	438.00	53.00	1493.00		247.00	703.00		994.00		50.00	116.00	1924.00
	MIN	15.00		0.00	65.00	33.00	639.00		152.00	309.00	1.00	1131.00		196.00	396.00		658.00		19.00	97.00	1862.00
	STD	2.72		-	6.20	7.58	56.97		20.86	22.49	11.18	72.72		10.81	43.71		50.03		4.46	4.15	14.17
	AVG	22.03		-	79.52	91.91	864.06		201.94	387.60		1374.16								108.78	1905.99
705	n	162		162	162	160	160		159	159		161								162	162
	MAX	31.00		0.00	98.00	104.00	987.00		307.00	437.00		1506.00								121.00	1924.00
	MIN	15.00		0.00	64.00	33.00	763.00		152.00	319.00		1231.00								88.00	1890.00
	STD	2.50		-	5.75	7.43	41.95		18.54	18.58		55.31								4.84	7.41
706	AVG	21.66		-	79.52	92.61	868.68	1046.07	210.92	387.11	16.40	1377.41	791.33	226.81	504.81	461.59	798.83	325.72	25.30	110.10	1901.59
	n	207		219	205	207	206	159	213	212	158	207	160	165	162	156	162	64	167	206	215
	MAX	42.00		0.00	99.00	104.00	999.00	1194.00	354.00	444.00	80.00	1526.00	941.00	259.00	793.00	532.00	919.00	479.00	90.00	166.00	1924.00
	MIN	13.00		0.00	60.00	32.00	568.00	675.00	172.00	320.00	1.00	1216.00	152.00	181.00	303.00	383.00	273.00	234.00	15.00	98.00	1869.00
706	STD	3.21		-	6.62	6.04	48.36	56.89	25.33	18.17	12.07	54.37	67.44	12.48	39.98	25.11	58.32	28.89	6.14	7.32	13.10
	AVG	21.26		-	76.53	92.87	862.99	1007.00	206.86	387.86		1363.49	748.00	222.26	497.44	458.00	784.39		23.22	110.11	1906.26
	n	197		197	197	195	195	1	196	197		197	1	196	194	1	195		196	197	197
	MAX	34.00		0.00	107.00	106.00	971.00	1007.00	799.00	428.00		1564.00	748.00	313.00	611.00	458.00	898.00		36.00	125.00	1923.00
Total	MIN	16.00		0.00	63.00	25.00	724.00	1007.00	164.00	251.00		1160.00	748.00	183.00	409.00	458.00	175.00		15.00	98.00	1886.00
	STD	2.87		-	5.51	6.32	43.43	-	46.38	18.87		57.36	-	15.50	30.67	-	87.25		3.15	4.49	9.69
	AVG	21.70	74.00	-	78.17	92.10	859.09	1107.15	204.04	386.54	14.70	1366.20	790.58	222.55	501.67	461.64	797.44	325.72	24.25	109.07	1904.30
	n	874	6	893	875	875	866	165	871	871	445	871	166	662	654	161	654	64	668	876	885
Total	MAX	82.00	81.00	0.00	107.00	106.00	999.00	11125.00	799.00	586.00	80.00	1574.00	941.00	313.00	793.00	532.00	994.00	479.00	90.00	166.00	1924.00
	MIN	13.00	61.00	0.00	60.00	25.00	536.00	675.00	102.00	216.00	1.00	958.00	152.00	124.00	303.00	383.00	175.00	234.00	14.00	88.00	1862.00
	STD	3.99	7.32	-	5.88	6.23	48.77	786.66	30.14	26.67	11.00	62.27	68.83	14.23	35.54	24.77	63.20	28.89	5.00	5.61	10.56

Table A- 19. Summary Statistics for Males from the County of Tarnowskie Gory (Sikora, 1956).

ID	STAT	ACH	AGE	CEI	DAH	FAH	HGT	ICB	MCB	MCL	NAB	NAL	NPH	PUH	SHB	STH	ZYB
1001	AVG	1372.49	31.27	84.61	625.22	118.76	1681.29	295.27	157.43	186.16	34.27	52.37	67.12	863.24	369.94	1366.43	139.69
	n	49	49	49	49	49	49	49	49	49	49	49	49	45	49	49	49
	MAX	1495.00	48.00	89.44	690.00	130.00	1814.00	334.00	165.00	197.00	40.00	60.00	76.00	977.00	391.00	1484.00	152.00
	MIN	1295.00	22.00	77.37	533.00	105.00	1590.00	250.00	147.00	173.00	30.00	44.00	56.00	795.00	341.00	1294.00	130.00
1002	STD	52.48	5.83	2.57	32.67	5.33	55.17	16.97	4.02	5.59	2.30	3.05	4.16	39.03	14.11	48.50	4.60
	AVG	1367.19	31.95	84.94	625.23	120.28	1674.05	296.86	157.05	185.05	34.86	52.56	68.72	854.10	373.60	1358.86	138.65
	n	43	43	43	43	43	43	43	43	43	43	43	43	42	43	43	43
	MAX	1493.00	49.00	93.41	698.00	133.00	1795.00	330.00	170.00	201.00	43.00	58.00	80.00	941.00	400.00	1480.00	150.00
1003	MIN	1259.00	22.00	78.11	560.00	107.00	1561.00	270.00	145.00	170.00	31.00	46.00	56.00	793.00	305.00	1266.00	127.00
	STD	46.24	6.87	3.54	27.36	6.13	50.14	16.55	5.51	6.57	2.71	2.80	4.95	35.92	18.74	42.42	4.83
	AVG	1350.18	33.40	84.57	608.00	120.15	1654.98	296.58	157.70	186.60	35.03	51.23	69.03	853.31	375.23	1348.73	139.90
	n	40	40	40	40	40	40	40	40	40	40	40	40	39	40	40	40
1004	MAX	1431.00	52.00	90.45	644.00	137.00	1746.00	325.00	165.00	197.00	44.00	57.00	80.00	955.00	404.00	1432.00	157.00
	MIN	1233.00	20.00	78.65	525.00	108.00	1524.00	270.00	150.00	177.00	29.00	42.00	60.00	774.00	327.00	1236.00	122.00
	STD	51.91	8.34	3.04	29.11	6.80	58.22	14.20	4.62	5.46	2.90	3.39	4.44	40.63	15.91	51.89	6.25
	AVG	1323.82	34.50	85.74	599.82	119.28	1633.40	286.54	157.64	183.96	33.82	52.52	68.00	830.86	364.30	1323.92	139.06
1005	n	50	50	50	50	50	50	50	50	50	50	50	50	49	50	50	50
	MAX	1440.00	47.00	91.48	683.00	138.00	1765.00	338.00	170.00	196.00	41.00	58.00	73.00	911.00	390.00	1440.00	150.00
	MIN	1184.00	25.00	80.10	516.00	104.00	1478.00	250.00	145.00	170.00	30.00	46.00	57.00	748.00	323.00	1184.00	130.00
	STD	54.95	6.00	2.96	34.58	5.76	60.14	18.14	5.22	5.79	2.39	3.01	3.61	39.65	16.19	52.96	4.89
1006	AVG	1342.56	29.52	84.24	612.13	117.87	1647.74	289.30	156.81	186.30	34.50	52.94	67.15	848.31	365.02	1337.44	138.33
	n	54	54	54	54	54	54	54	54	54	54	54	54	52	54	54	54
	MAX	1460.00	60.00	89.77	701.00	131.00	1768.00	333.00	167.00	197.00	43.00	60.00	75.00	927.00	402.00	1444.00	150.00
	MIN	1237.00	19.00	77.16	530.00	103.00	1537.00	252.00	147.00	173.00	30.00	48.00	57.00	764.00	333.00	1236.00	125.00
1007	STD	50.71	8.22	2.93	34.20	5.70	59.69	15.89	4.07	6.03	2.60	2.80	4.27	38.75	17.70	50.97	4.75
	AVG	1349.05	31.75	84.54	620.93	116.68	1648.86	293.11	157.41	186.39	34.50	50.77	65.98	848.29	366.34	1345.27	139.27
	n	44	44	44	44	44	44	44	44	44	44	44	44	42	44	44	44
	MAX	1452.00	47.00	95.00	700.00	130.00	1771.00	337.00	171.00	200.00	41.00	60.00	75.00	935.00	400.00	1458.00	151.00
1008	MIN	1248.00	20.00	78.01	557.00	104.00	1543.00	252.00	147.00	174.00	30.00	45.00	60.00	783.00	308.00	1261.00	129.00
	STD	46.75	6.81	3.63	29.49	6.22	50.98	19.56	5.40	7.02	2.67	3.12	3.66	36.26	20.28	42.92	5.00
	AVG	1353.16	32.16	85.39	623.97	121.29	1656.21	297.26	159.50	186.92	35.37	53.03	69.61	846.71	371.26	1346.76	140.97
	n	38	38	38	38	38	38	38	38	38	38	38	38	35	38	38	38
1009	MAX	1435.00	46.00	96.83	680.00	132.00	1771.00	340.00	183.00	200.00	40.00	60.00	79.00	907.00	403.00	1436.00	150.00
	MIN	1270.00	21.00	77.44	563.00	105.00	1550.00	257.00	147.00	177.00	31.00	43.00	62.00	774.00	341.00	1257.00	130.00
	STD	43.17	6.91	3.98	23.61	6.12	48.29	20.72	6.70	5.88	2.05	3.51	3.92	33.36	16.00	41.90	4.95
	AVG	1344.67	32.57	84.01	613.41	119.08	1645.98	282.33	156.35	186.24	34.53	52.39	66.90	842.65	359.22	1338.63	139.04
1010	n	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49
	MAX	1511.00	50.00	91.98	681.00	133.00	1800.00	312.00	172.00	197.00	40.00	58.00	73.00	974.00	390.00	1474.00	150.00
	MIN	1250.00	21.00	77.72	546.00	111.00	1530.00	248.00	146.00	171.00	30.00	47.00	60.00	752.00	312.00	1230.00	127.00
	STD	51.69	8.40	3.00	34.07	5.08	55.96	16.25	4.77	6.05	2.35	2.41	3.53	40.57	18.47	48.84	5.09
1010	AVG	1342.93	31.14	84.85	605.38	118.81	1647.33	294.71	155.81	183.74	34.21	52.17	67.52	844.40	368.48	1339.24	137.60
	n	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
	MAX	1441.00	45.00	88.95	672.00	128.00	1764.00	332.00	165.00	191.00	40.00	58.00	73.00	932.00	395.00	1444.00	147.00
	MIN	1191.00	18.00	77.49	537.00	103.00	1494.00	243.00	147.00	171.00	30.00	48.00	57.00	760.00	334.00	1204.00	127.00
1010	STD	56.28	8.04	2.74	36.64	5.41	64.55	18.12	4.29	5.50	2.47	2.52	3.35	50.00	15.27	55.21	4.94
	AVG	1353.36	31.62	84.55	619.04	118.04	1661.60	287.04	156.36	185.10	34.74	51.62	67.06	844.92	364.12	1348.98	138.64

Table A-19 (Continued)

ID	STAT	ACH	AGE	CEI	DAH	FAH	HGT	ICB	MCB	MCL	NAB	NAL	NPH	PUH	SHB	STH	ZYB
	n	50	50	50	50	50	50	50	50	50	50	50	50	49	50	50	50
	MAX	1467.00	48.00	92.49	692.00	127.00	1772.00	330.00	169.00	197.00	43.00	60.00	75.00	935.00	410.00	1453.00	147.00
	MIN	1221.00	20.00	78.06	538.00	103.00	1505.00	250.00	145.00	173.00	27.00	43.00	58.00	744.00	320.00	1210.00	127.00
	STD	55.41	8.68	3.31	38.41	5.00	59.00	17.59	4.51	6.06	2.80	3.17	4.00	43.48	17.02	52.56	4.54
1011	AVG	1357.03	35.23	84.73	619.41	119.90	1663.69	294.31	157.33	185.82	35.13	51.79	69.23	854.57	364.92	1350.18	140.46
	n	39	39	39	39	39	39	39	39	39	39	39	39	35	39	39	39
	MAX	1490.00	49.00	91.67	700.00	135.00	1828.00	321.00	169.00	201.00	41.00	61.00	81.00	944.00	398.00	1470.00	153.00
	MIN	1250.00	20.00	78.87	552.00	104.00	1547.00	209.00	140.00	171.00	30.00	46.00	58.00	760.00	321.00	1243.00	127.00
	STD	50.69	7.71	3.07	33.54	6.18	58.17	21.34	5.77	7.03	2.30	3.90	5.24	39.73	17.61	50.90	5.54
1012	AVG	1348.93	33.09	84.27	615.72	118.84	1655.65	286.53	158.16	187.86	34.07	52.53	67.35	840.95	360.77	1349.44	141.02
	n	43	43	43	43	43	43	43	43	43	43	43	43	42	43	43	43
	MAX	1511.00	50.00	90.91	720.00	128.00	1824.00	320.00	167.00	201.00	40.00	58.00	76.00	970.00	390.00	1488.00	150.00
	MIN	1235.00	20.00	78.46	546.00	110.00	1550.00	207.00	150.00	175.00	30.00	47.00	60.00	750.00	342.00	1258.00	133.00
	STD	61.77	7.28	2.93	35.35	5.24	65.56	20.30	3.79	6.83	2.37	2.71	3.72	49.40	10.96	58.10	4.21
1013	AVG	1360.63	36.54	83.75	615.17	120.11	1668.96	294.37	157.54	188.26	35.52	53.70	68.17	851.43	367.74	1358.72	140.52
	n	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46
	MAX	1510.00	50.00	90.64	720.00	137.00	1846.00	343.00	170.00	206.00	42.00	63.00	80.00	961.00	419.00	1508.00	152.00
	MIN	1213.00	24.00	77.54	537.00	103.00	1500.00	200.00	145.00	171.00	30.00	47.00	60.00	743.00	322.00	1210.00	131.00
	STD	61.39	6.54	3.05	36.23	6.58	69.12	25.81	5.18	7.04	2.87	3.88	4.69	52.30	18.32	60.66	5.16
1014	AVG	1331.68	34.28	85.02	605.36	118.08	1640.80	297.61	157.30	185.18	34.92	53.00	66.62	843.21	365.12	1331.68	139.94
	n	50	50	50	50	50	50	46	50	50	50	50	50	39	49	50	50
	MAX	1466.00	60.00	92.78	685.00	130.00	1747.00	362.00	167.00	197.00	43.00	60.00	73.00	913.00	402.00	1445.00	154.00
	MIN	1182.00	18.00	76.17	458.00	105.00	1480.00	227.00	147.00	173.00	28.00	43.00	60.00	720.00	323.00	1176.00	130.00
	STD	58.60	11.30	3.54	44.14	5.23	62.92	22.39	5.02	6.10	2.55	3.70	3.61	45.10	18.40	57.13	4.95
1015	AVG	1333.96	32.84	84.40	607.04	118.33	1646.43	279.06	156.69	185.75	34.24	50.80	67.04	837.69	360.02	1344.22	137.61
	n	51	51	51	51	51	51	51	51	51	51	51	51	49	51	51	51
	MAX	1405.00	53.00	90.40	671.00	130.00	1747.00	322.00	170.00	200.00	41.00	58.00	75.00	910.00	391.00	1618.00	147.00
	MIN	1214.00	20.00	78.53	521.00	110.00	1520.00	248.00	150.00	175.00	30.00	45.00	55.00	771.00	323.00	1233.00	130.00
	STD	41.07	8.57	2.64	29.59	4.88	47.21	17.18	4.80	5.96	2.11	2.91	4.05	31.02	14.43	54.93	4.26
1016	AVG	1327.25	32.47	84.15	604.67	117.83	1632.56	285.14	156.53	186.17	33.69	53.31	67.22	829.36	357.61	1325.19	138.28
	n	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36
	MAX	1427.00	49.00	91.53	660.00	131.00	1723.00	312.00	167.00	201.00	39.00	60.00	75.00	910.00	382.00	1407.00	148.00
	MIN	1185.00	18.00	78.11	514.00	107.00	1486.00	238.00	149.00	174.00	28.00	47.00	60.00	722.00	323.00	1192.00	130.00
	STD	51.51	9.48	2.84	29.47	4.92	50.74	13.80	4.49	6.70	2.18	3.12	3.58	44.41	14.64	47.73	5.22
1017	AVG	1341.67	37.67	84.70	604.70	119.23	1646.42	289.88	155.86	184.14	34.30	54.02	69.07	840.93	363.12	1336.14	137.12
	n	43	43	43	43	43	43	43	43	43	43	43	43	42	43	43	43
	MAX	1472.00	52.00	91.06	674.00	138.00	1805.00	334.00	170.00	197.00	40.00	60.00	76.00	927.00	397.00	1454.00	151.00
	MIN	1181.00	24.00	73.68	520.00	106.00	1480.00	243.00	140.00	174.00	30.00	46.00	63.00	741.00	323.00	1184.00	129.00
	STD	59.10	7.19	3.82	35.60	6.81	61.84	20.01	6.37	5.78	2.20	3.44	3.61	39.83	17.17	53.66	5.75
1018	AVG	1338.47	30.38	84.85	606.49	118.09	1645.04	289.16	156.89	185.07	34.56	52.09	67.69	841.02	362.51	1339.20	138.20
	n	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
	MAX	1466.00	49.00	91.43	691.00	131.00	1784.00	330.00	165.00	201.00	40.00	60.00	80.00	951.00	400.00	1462.00	150.00
	MIN	1206.00	19.00	78.84	528.00	107.00	1498.00	242.00	147.00	175.00	30.00	45.00	58.00	724.00	324.00	1221.00	127.00
	STD	65.72	8.31	3.34	39.46	5.38	72.16	18.08	4.49	6.44	2.63	2.89	4.80	51.18	16.24	62.94	4.66
1019	AVG	1343.02	35.86	83.20	607.82	118.47	1650.24	291.20	155.22	186.78	33.84	52.84	65.33	848.45	364.39	1343.65	138.71
	n	49	49	49	49	49	49	49	49	49	49	49	49	47	49	49	49
	MAX	1477.00	51.00	93.57	676.00	131.00	1805.00	320.00	167.00	201.00	38.00	60.00	76.00	977.00	392.00	1473.00	150.00
	MIN	1180.00	24.00	74.23	531.00	110.00	1482.00	270.00	144.00	171.00	30.00	47.00	59.00	720.00	327.00	1196.00	123.00

Table A-19 (Continued)

ID	STAT	ACH	AGE	CEI	DAH	FAH	HGT	ICB	MCB	MCL	NAB	NAL	NPH	PUH	SHB	STH	ZYB
	STD	62.84	7.34	3.77	35.09	5.38	66.19	14.19	4.94	6.62	2.09	3.12	4.13	47.70	14.60	57.06	5.44
1020	AVG	1341.86	35.12	84.79	610.78	119.78	1650.54	290.63	157.22	185.56	34.12	53.94	68.80	847.72	364.06	1340.92	139.10
	n	49	50	50	49	50	50	48	50	50	50	50	50	47	49	49	50
	MAX	1456.00	55.00	91.06	685.00	130.00	1770.00	320.00	168.00	200.00	40.00	60.00	80.00	930.00	402.00	1460.00	151.00
	MIN	1220.00	20.00	75.50	521.00	107.00	1503.00	253.00	150.00	170.00	28.00	48.00	58.00	756.00	321.00	1213.00	130.00
	STD	52.08	9.51	2.91	35.05	4.25	60.96	17.36	4.59	6.12	2.80	2.74	3.65	40.88	17.17	52.23	5.02
1021	AVG	1344.70	33.48	83.82	608.15	119.21	1651.70	290.91	156.03	186.30	34.55	53.39	68.48	844.38	366.81	1343.27	137.06
	n	33	33	33	33	33	33	32	33	33	33	33	33	32	32	33	33
	MAX	1525.00	49.00	91.43	708.00	136.00	1856.00	358.00	169.00	198.00	39.00	64.00	78.00	971.00	419.00	1510.00	147.00
	MIN	1220.00	21.00	78.61	551.00	110.00	1491.00	219.00	147.00	174.00	30.00	46.00	61.00	753.00	332.00	1220.00	120.00
	STD	53.32	8.91	3.18	31.43	6.39	59.30	24.92	4.95	6.53	2.05	3.70	4.27	45.10	20.06	51.25	6.36
1022	AVG	1352.30	38.60	84.55	620.82	118.06	1661.80	303.26	158.42	187.58	35.26	52.36	66.82	854.16	370.58	1353.52	140.52
	n	50	50	50	49	50	50	50	50	50	50	50	50	45	50	50	50
	MAX	1487.00	68.00	92.73	704.00	130.00	1796.00	342.00	173.00	204.00	40.00	61.00	74.00	964.00	409.00	1490.00	157.00
	MIN	1211.00	23.00	72.96	525.00	105.00	1511.00	253.00	143.00	165.00	30.00	45.00	60.00	747.00	331.00	1225.00	122.00
	STD	57.84	9.28	3.50	36.02	5.83	61.95	17.85	5.75	8.30	2.28	3.21	4.13	43.41	15.70	54.26	6.33
1023	AVG	1367.21	33.14	85.52	623.19	117.65	1670.38	301.90	159.05	186.05	35.16	50.28	65.70	864.08	372.83	1367.83	140.30
	n	42	43	43	42	43	42	42	43	43	43	43	43	40	42	42	43
	MAX	1461.00	50.00	94.59	682.00	128.00	1781.00	334.00	175.00	195.00	46.00	56.00	77.00	968.00	401.00	1468.00	151.00
	MIN	1262.00	20.00	81.08	554.00	105.00	1553.00	270.00	150.00	176.00	30.00	44.00	60.00	782.00	343.00	1264.00	130.00
	STD	56.90	8.37	3.30	31.77	5.30	64.12	16.09	5.46	4.40	2.97	3.03	4.42	40.72	14.64	54.42	5.23
1024	AVG	1358.74	30.94	83.80	616.77	120.13	1657.87	298.16	156.87	187.32	34.84	53.13	68.52	861.38	370.58	1351.55	140.16
	n	31	31	31	31	31	31	31	31	31	31	31	31	29	31	31	31
	MAX	1455.00	49.00	90.91	691.00	130.00	1760.00	341.00	171.00	199.00	40.00	65.00	80.00	945.00	400.00	1446.00	151.00
	MIN	1271.00	21.00	77.89	531.00	110.00	1560.00	270.00	150.00	175.00	31.00	48.00	60.00	757.00	343.00	1272.00	132.00
	STD	59.91	7.06	3.26	37.60	5.07	62.86	17.91	5.30	6.10	2.48	3.56	4.40	49.42	15.69	54.12	4.75
TOTAL	AVG	1347.47	33.35	84.55	613.22	118.86	1653.80	291.92	157.13	185.99	34.57	52.43	67.56	847.06	366.03	1345.27	139.16
	COUNT	1066.00	1068.00	1068.00	1064.00	1068.00	1067.00	1059.00	1068.00	1068.00	1068.00	1068.00	1068.00	1018.00	1064.00	1066.00	1068.00
	MAX	1525.00	68.00	96.83	720.00	138.00	1856.00	362.00	183.00	206.00	46.00	65.00	81.00	977.00	419.00	1618.00	157.00
	MIN	1180.00	18.00	72.96	458.00	103.00	1478.00	200.00	140.00	165.00	27.00	42.00	55.00	670.00	305.00	1176.00	120.00
	STD	55.38	8.31	3.23	34.66	5.67	60.33	19.25	5.06	6.33	2.51	3.27	4.21	43.02	17.00	53.35	5.19

Table A- 20. Summary Statistics for Males from the County of Rybnik (Stołyhwo et al., 1956).

ID	STAT	ACH	AGE	CEI	DAH	FAH	HGT	ICB	MCB	MCL	NAB	NAL	NPH	PUH	SHB	STH	ZYB
2001	AVG	1364.00	33.08	84.70	613.83	122.42	1670.79	300.21	155.06	183.19	34.33	52.90	70.42	863.35	369.62	1358.56	135.27
	n	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48
	MAX	1475.00	54.00	90.71	700.00	134.00	1784.00	337.00	166.00	197.00	42.00	65.00	82.00	955.00	411.00	1460.00	151.00
	MIN	1198.00	20.00	77.66	530.00	111.00	1498.00	244.00	146.00	173.00	27.00	46.00	62.00	778.00	300.00	1205.00	125.00
	STD	53.46	9.16	2.84	34.39	5.83	61.67	15.64	4.32	5.27	3.21	3.50	4.47	41.06	20.78	53.96	6.32
2002	AVG	1357.18	33.17	84.42	615.22	120.22	1661.87	298.32	156.22	185.12	35.00	53.47	71.05	854.00	377.85	1354.18	139.33
	n	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	MAX	1480.00	50.00	91.05	711.00	134.00	1771.00	350.00	173.00	199.00	40.00	62.00	84.00	951.00	417.00	1467.00	158.00
	MIN	1220.00	20.00	78.07	538.00	110.00	1527.00	257.00	142.00	172.00	30.00	46.00	62.00	753.00	322.00	1247.00	131.00
	STD	49.63	7.38	2.97	34.65	5.85	51.15	15.80	5.50	5.27	1.90	3.71	4.54	42.00	18.81	47.41	5.01
2003	AVG	1351.20	31.24	84.61	599.49	120.76	1657.40	307.07	157.64	186.44	34.31	52.64	69.16	847.40	370.29	1351.04	140.53
	n	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
	MAX	1453.00	48.00	89.20	672.00	131.00	1770.00	342.00	167.00	200.00	40.00	74.00	79.00	982.00	409.00	1465.00	154.00
	MIN	1210.00	20.00	77.01	512.00	105.00	1473.00	273.00	144.00	173.00	30.00	47.00	62.00	751.00	334.00	1210.00	126.00
	STD	56.08	8.12	3.06	34.91	5.61	62.95	15.46	4.97	6.18	2.15	4.37	4.10	45.56	16.96	53.81	5.83
2004	AVG	1370.22	30.98	85.17	620.84	121.02	1675.49	304.94	158.31	186.02	34.61	51.71	68.27	857.00	376.37	1369.51	139.22
	n	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51
	MAX	1450.00	50.00	95.32	688.00	138.00	1761.00	341.00	170.00	197.00	41.00	61.00	80.00	945.00	412.00	1480.00	151.00
	MIN	1210.00	22.00	77.66	561.00	105.00	1523.00	267.00	150.00	171.00	28.00	44.00	60.00	750.00	321.00	1233.00	125.00
	STD	48.99	6.87	3.26	31.42	6.42	51.00	17.51	5.12	6.20	2.59	3.72	4.82	40.92	17.04	47.43	4.92
2005	AVG	1355.85	31.44	84.31	605.93	120.02	1659.51	298.59	155.73	185.00	34.20	52.00	68.51	859.46	377.46	1351.46	134.78
	n	41	41	41	40	41	41	41	41	41	41	41	41	41	41	41	41
	MAX	1450.00	52.00	94.64	649.00	131.00	1763.00	320.00	167.00	205.00	40.00	57.00	74.00	942.00	411.00	1415.00	143.00
	MIN	1205.00	21.00	73.66	540.00	105.00	1502.00	280.00	147.00	168.00	29.00	45.00	57.00	735.00	353.00	1196.00	127.00
	STD	44.63	6.45	4.36	27.54	5.33	49.21	11.56	5.23	7.69	2.46	2.85	3.62	36.72	13.89	41.54	4.90
2006	AVG	1361.33	30.71	84.03	611.69	120.61	1665.00	297.24	156.31	186.17	34.86	52.09	70.31	851.03	377.56	1352.40	139.73
	n	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
	MAX	1463.00	53.00	91.98	682.00	138.00	1804.00	340.00	172.00	205.00	39.00	65.00	81.00	940.00	420.00	1451.00	153.00
	MIN	1239.00	20.00	73.17	535.00	107.00	1515.00	253.00	143.00	170.00	31.00	44.00	60.00	761.00	350.00	1221.00	129.00
	STD	48.80	8.29	3.41	31.06	6.16	54.43	17.42	5.44	6.15	2.02	3.91	4.17	39.76	18.94	46.35	4.72
2007	AVG	1369.24	34.21	85.32	616.90	119.65	1676.81	297.16	156.73	183.79	34.25	53.59	70.05	865.30	365.51	1365.17	137.51
	n	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63
	MAX	1466.00	52.00	94.35	694.00	136.00	1782.00	323.00	167.00	200.00	44.00	62.00	80.00	944.00	408.00	1458.00	151.00
	MIN	1258.00	21.00	79.23	537.00	103.00	1572.00	263.00	143.00	169.00	30.00	45.00	61.00	779.00	324.00	1256.00	127.00
	STD	51.36	7.65	2.85	35.68	5.52	51.13	13.71	4.94	5.80	2.27	3.25	4.06	38.54	16.48	46.69	5.18
2008	AVG	1352.97	34.30	84.48	612.80	119.48	1654.92	302.57	158.03	187.18	35.02	51.30	67.95	843.21	375.28	1346.58	139.98
	n	60	60	60	60	60	60	60	60	60	60	60	60	57	60	60	60
	MAX	1445.00	49.00	93.44	684.00	129.00	1757.00	330.00	171.00	200.00	41.00	61.00	76.00	932.00	412.00	1435.00	150.00
	MIN	1232.00	20.00	77.54	548.00	111.00	1525.00	267.00	145.00	171.00	30.00	46.00	60.00	762.00	343.00	1224.00	120.00
	STD	47.33	8.00	3.52	31.87	5.24	53.37	16.93	5.89	5.90	2.33	3.21	3.72	36.40	15.40	46.13	6.09
2009	AVG	1362.58	34.21	85.21	607.61	119.30	1670.27	301.50	156.97	184.39	34.82	53.12	68.61	866.06	376.18	1361.30	136.55
	n	33	33	33	33	33	33	32	33	33	33	33	33	32	33	33	33
	MAX	1481.00	49.00	93.06	668.00	127.00	1801.00	335.00	167.00	197.00	41.00	56.00	75.00	992.00	404.00	1484.00	153.00
	MIN	1280.00	23.00	77.66	562.00	107.00	1560.00	277.00	149.00	171.00	32.00	44.00	58.00	796.00	341.00	1271.00	129.00
	STD	50.60	7.13	3.27	27.19	4.89	60.27	13.34	4.12	6.14	2.21	2.60	3.76	44.71	15.47	52.94	4.58
2010	AVG	1346.15	32.02	84.57	600.42	119.60	1649.88	299.02	158.40	187.43	34.55	51.13	66.55	836.51	366.13	1349.73	139.33
	n	60	60	60	60	60	60	60	60	60	60	60	60	59	60	60	60
	MAX	1471.00	48.00	90.91	664.00	141.00	1808.00	350.00	170.00	204.00	41.00	60.00	77.00	969.00	403.00	1633.00	152.00
	MIN	1194.00	21.00	73.30	512.00	107.00	1483.00	270.00	140.00	173.00	30.00	40.00	56.00	691.00	333.00	1182.00	127.00
	STD	51.94	7.94	3.45	30.63	7.30	58.39	16.35	5.59	5.90	1.95	3.58	4.54	47.42	17.21	64.08	5.35
2011	AVG	1367.88	35.59	86.02	615.24	127.73	1677.02	301.71	158.61	184.57	34.68	57.05	76.71	860.86	383.16	1364.71	140.68
	n	56	56	56	55	56	56	56	56	56	56	56	56	56	56	56	56
	MAX	1485.00	53.00	94.38	717.00	140.00	1798.00	345.00	168.00	201.00	40.00	64.00	85.00	957.00	420.00	1470.00	151.00
	MIN	1215.00	21.00	79.17	510.00	117.00	1523.00	270.00	149.00	171.00	30.00	48.00	66.00	765.00	352.00	1230.00	128.00

Table A-20 (Continued)

ID	STAT	ACH	AGE	CEI	DAH	FAH	HGT	ICB	MCB	MCL	NAB	NAL	NPH	PUH	SHB	STH	ZYB
	STD	57.39	8.95	3.40	35.98	5.40	63.13	16.97	4.29	6.47	2.34	3.57	4.78	46.15	15.35	56.55	4.24
2012	AVG	1367.98	32.14	84.22	620.62	122.92	1674.12	300.88	156.40	185.82	35.18	53.68	72.62	852.75	381.10	1362.60	140.92
	n	50	50	50	50	50	50	50	50	50	50	50	50	48	50	50	50
	MAX	1446.00	61.00	90.40	670.00	134.00	1788.00	380.00	167.00	200.00	44.00	64.00	83.00	926.00	422.00	1456.00	150.00
	MIN	1260.00	19.00	78.06	521.00	113.00	1550.00	261.00	146.00	173.00	28.00	45.00	64.00	776.00	272.00	1273.00	127.00
	STD	48.09	9.86	2.98	30.13	5.46	54.57	17.83	5.41	6.65	2.99	3.64	3.84	37.96	22.80	45.81	5.03
2013	AVG	1347.57	33.21	83.94	607.22	118.95	1654.67	296.90	155.48	185.36	35.12	52.55	69.29	846.95	370.81	1346.14	137.10
	n	42	42	42	41	42	42	42	42	42	42	42	42	42	42	42	42
	MAX	1450.00	50.00	90.40	672.00	135.00	1796.00	329.00	168.00	199.00	40.00	60.00	80.00	977.00	412.00	1465.00	151.00
	MIN	1244.00	23.00	76.47	540.00	108.00	1546.00	263.00	143.00	173.00	30.00	47.00	64.00	764.00	337.00	1240.00	127.00
	STD	54.86	6.46	2.96	28.11	5.69	62.15	16.09	5.25	6.58	2.31	2.67	3.83	47.22	19.62	54.32	5.40
2014	AVG	1374.68	37.83	84.84	631.59	125.58	1687.66	300.12	160.19	188.93	35.36	54.12	74.31	859.19	383.76	1374.64	143.37
	n	59	59	59	58	59	59	59	59	59	59	59	59	58	59	59	59
	MAX	1514.00	64.00	96.47	717.00	138.00	1830.00	340.00	170.00	204.00	40.00	70.00	84.00	982.00	422.00	1525.00	158.00
	MIN	1286.00	18.00	78.43	550.00	112.00	1573.00	262.00	148.00	170.00	30.00	43.00	64.00	776.00	330.00	1273.00	132.00
	STD	49.78	10.09	2.97	34.20	6.15	53.58	17.33	4.67	6.10	2.62	4.19	4.32	37.74	17.75	48.82	5.51
2016	AVG	1355.97	31.81	84.65	607.38	119.31	1658.95	293.45	155.77	184.11	34.14	52.34	68.75	857.44	373.08	1352.55	137.28
	n	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
	MAX	1496.00	48.00	91.67	677.00	129.00	1825.00	320.00	166.00	195.00	38.00	60.00	77.00	976.00	412.00	1476.00	150.00
	MIN	1217.00	20.00	78.95	544.00	105.00	1513.00	257.00	148.00	173.00	30.00	47.00	60.00	746.00	337.00	1224.00	128.00
	STD	54.70	6.75	2.74	28.98	5.31	57.06	14.63	4.29	5.19	2.04	3.01	3.73	46.61	14.29	50.82	4.53
2017	AVG	1359.08	31.10	84.96	617.62	124.38	1667.02	296.44	156.85	184.73	34.31	53.79	72.29	855.75	384.90	1358.33	141.60
	n	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52
	MAX	1480.00	46.00	90.75	680.00	136.00	1785.00	327.00	166.00	198.00	39.00	61.00	80.00	959.00	422.00	1460.00	168.00
	MIN	1201.00	22.00	79.69	542.00	108.00	1517.00	270.00	145.00	172.00	31.00	47.00	64.00	746.00	350.00	1194.00	131.00
	STD	61.32	5.26	2.62	37.05	5.99	62.78	14.24	4.02	5.67	1.73	3.39	3.65	45.75	15.69	57.17	6.24
2018	AVG	1374.19	34.19	85.18	623.32	121.68	1682.06	301.42	157.29	184.74	35.52	53.52	70.00	876.77	376.55	1372.90	136.97
	n	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
	MAX	1478.00	54.00	89.50	686.00	133.00	1796.00	320.00	167.00	193.00	40.00	60.00	80.00	991.00	400.00	1478.00	147.00
	MIN	1300.00	20.00	78.24	570.00	108.00	1594.00	257.00	149.00	172.00	31.00	47.00	63.00	777.00	353.00	1278.00	130.00
	STD	43.35	10.22	2.69	32.86	5.42	47.18	14.21	4.17	5.06	2.31	3.11	3.94	42.44	13.31	42.45	4.50
2019	AVG	1362.14	29.75	83.40	619.43	121.96	1670.71	302.32	156.46	187.75	34.82	53.64	72.11	855.15	391.57	1358.68	139.46
	n	28	28	28	28	28	28	28	28	28	28	28	28	27	28	28	28
	MAX	1473.00	48.00	89.84	707.00	133.00	1786.00	347.00	168.00	198.00	39.00	62.00	81.00	935.00	412.00	1456.00	147.00
	MIN	1207.00	20.00	78.68	550.00	108.00	1514.00	268.00	148.00	175.00	32.00	45.00	62.00	720.00	347.00	1207.00	130.00
	STD	55.74	7.67	3.22	31.17	5.38	58.92	19.44	4.21	5.57	1.85	4.10	4.47	50.84	14.62	53.97	4.38
2020	AVG	1352.23	33.03	84.33	607.90	120.47	1652.33	301.43	155.13	184.13	35.03	52.57	70.13	849.38	367.97	1343.70	135.70
	n	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	30
	MAX	1423.00	47.00	92.49	666.00	138.00	1731.00	344.00	163.00	199.00	43.00	62.00	82.00	915.00	401.00	1420.00	146.00
	MIN	1232.00	22.00	77.72	560.00	108.00	1520.00	275.00	149.00	171.00	30.00	45.00	64.00	750.00	343.00	1230.00	124.00
	STD	45.04	7.14	3.42	28.07	5.96	48.38	19.17	4.34	6.23	2.28	3.58	3.89	38.05	14.29	43.34	5.45
2021	AVG	1372.53	35.16	83.83	622.17	124.18	1681.13	300.60	156.35	186.60	34.47	55.05	73.75	868.18	377.67	1368.05	139.85
	n	55	55	55	54	55	55	55	55	55	55	55	55	55	55	55	55
	MAX	1514.00	56.00	90.40	700.00	137.00	1819.00	376.00	171.00	200.00	41.00	63.00	82.00	964.00	417.00	1498.00	150.00
	MIN	1233.00	20.00	78.17	561.00	113.00	1476.00	262.00	141.00	173.00	29.00	50.00	62.00	734.00	312.00	1177.00	123.00
	STD	56.16	10.63	2.80	33.24	6.30	64.86	19.38	5.51	6.27	2.47	3.19	4.58	45.59	20.43	57.28	5.67
2022	AVG	1367.42	33.09	85.72	621.13	119.20	1677.89	298.95	158.81	185.48	34.70	52.20	69.88	863.92	376.20	1362.33	139.95
	n	64	64	64	64	64	64	64	64	64	64	64	64	63	64	64	64
	MAX	1490.00	46.00	95.81	694.00	133.00	1812.00	334.00	170.00	208.00	40.00	60.00	80.00	956.00	403.00	1484.00	150.00
	MIN	1267.00	20.00	78.37	566.00	110.00	1571.00	271.00	151.00	167.00	30.00	44.00	61.00	616.00	338.00	1271.00	127.00
	STD	50.56	6.26	3.50	30.31	5.47	53.57	12.87	4.46	7.02	2.35	3.51	4.25	51.34	16.22	46.17	4.94
2023	AVG	1354.50	29.53	84.04	613.48	117.63	1657.37	293.42	155.48	185.13	33.92	50.32	68.50	855.18	377.85	1345.74	138.76
	n	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62
	MAX	1466.00	46.00	92.02	679.00	130.00	1788.00	375.00	167.00	200.00	38.00	60.00	78.00	956.00	412.00	1468.00	148.00
	MIN	1180.00	18.00	76.56	542.00	104.00	1525.00	263.00	143.00	163.00	30.00	41.00	61.00	702.00	331.00	1165.00	130.00
	STD	58.32	6.86	3.38	32.42	5.71	60.79	17.45	6.27	6.90	2.04	3.48	4.17	44.22	19.74	56.49	4.65

Table A-20 (Continued)

ID	STAT	ACH	AGE	CEI	DAH	FAH	HGT	ICB	MCB	MCL	NAB	NAL	NPH	PUH	SHB	STH	ZYB
2024	AVG	1349.41	33.63	84.96	606.89	126.07	1660.11	295.00	156.20	183.98	34.34	55.36	75.45	858.05	374.80	1349.91	139.23
	n	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56
	MAX	1446.00	55.00	93.64	684.00	138.00	1787.00	320.00	171.00	197.00	40.00	65.00	85.00	943.00	420.00	1456.00	150.00
	MIN	1242.00	20.00	75.51	530.00	111.00	1540.00	264.00	147.00	170.00	29.00	48.00	66.00	768.00	336.00	1238.00	128.00
	STD	56.25	9.64	3.51	33.38	5.03	62.07	14.18	5.71	6.03	2.31	3.93	4.03	38.87	18.47	55.31	4.92
2025	AVG	1364.56	31.51	85.27	611.14	119.02	1675.34	299.41	157.79	185.25	33.61	52.02	68.70	871.87	373.74	1361.69	138.74
	n	61	61	61	59	61	61	61	61	61	61	61	61	60	61	61	61
	MAX	1479.00	49.00	92.05	678.00	132.00	1801.00	328.00	166.00	203.00	39.00	61.00	80.00	957.00	403.00	1490.00	147.00
	MIN	1260.00	20.00	77.44	553.00	105.00	1526.00	257.00	143.00	166.00	22.00	44.00	60.00	778.00	343.00	1251.00	129.00
	STD	53.13	6.38	3.12	30.27	5.93	57.50	17.37	4.21	7.15	2.81	3.71	4.31	38.14	15.20	49.52	4.18
2026	AVG	1355.10	33.61	84.66	608.27	119.98	1665.48	296.06	156.71	185.21	34.48	52.23	70.74	859.89	371.03	1350.60	138.31
	n	62	62	62	62	62	62	62	62	62	62	62	62	61	62	62	62
	MAX	1468.00	49.00	93.22	675.00	138.00	1761.00	324.00	170.00	197.00	39.00	60.00	81.00	942.00	400.00	1434.00	152.00
	MIN	1243.00	20.00	76.17	514.00	106.00	1558.00	237.00	147.00	175.00	30.00	40.00	60.00	772.00	330.00	1257.00	127.00
	STD	46.89	7.71	3.18	28.27	5.81	48.94	16.74	4.92	4.94	2.07	3.12	4.08	36.53	15.72	43.14	5.37
2027	AVG	1369.05	32.97	85.19	634.48	121.05	1677.88	305.35	156.73	184.10	35.38	52.78	70.43	857.77	379.92	1365.45	139.72
	n	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	MAX	1482.00	50.00	96.34	692.00	143.00	1790.00	333.00	182.00	196.00	40.00	65.00	88.00	981.00	411.00	1474.00	149.00
	MIN	1236.00	21.00	77.54	567.00	105.00	1540.00	259.00	144.00	164.00	29.00	44.00	55.00	779.00	336.00	1236.00	125.00
	STD	53.49	7.61	3.93	27.83	6.45	56.79	14.94	6.71	5.96	2.42	4.31	5.38	46.83	18.18	51.60	5.50
2028	AVG	1359.22	32.24	83.99	612.21	121.47	1656.07	298.22	156.24	186.19	34.45	52.62	71.66	851.00	383.57	1346.21	139.55
	n	58	58	58	57	58	58	58	58	58	58	58	58	58	58	58	58
	MAX	1471.00	49.00	96.93	690.00	135.00	1760.00	340.00	170.00	200.00	40.00	67.00	81.00	953.00	420.00	1444.00	153.00
	MIN	1234.00	23.00	76.34	495.00	110.00	1532.00	255.00	142.00	163.00	30.00	42.00	62.00	765.00	340.00	1234.00	129.00
	STD	44.43	6.66	3.60	35.24	5.80	45.45	16.58	6.13	7.34	2.22	4.14	4.42	37.21	15.31	40.75	5.38
2029	AVG	1360.10	32.02	85.68	611.31	123.68	1678.02	298.25	159.68	186.58	34.68	54.61	72.61	868.58	380.02	1358.08	141.75
	n	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59
	MAX	1508.00	52.00	93.57	708.00	137.00	1939.00	340.00	170.00	200.00	41.00	60.00	85.00	970.00	409.00	1475.00	150.00
	MIN	1257.00	20.00	80.00	550.00	110.00	1555.00	270.00	150.00	170.00	30.00	47.00	64.00	783.00	348.00	1248.00	130.00
	STD	45.17	7.78	3.43	29.90	6.55	61.53	15.02	4.40	6.97	2.58	3.28	4.29	36.79	15.34	43.88	4.66
2030	AVG	1366.56	34.67	85.37	614.15	123.21	1675.10	305.49	158.64	186.03	34.60	54.47	73.06	862.71	383.36	1362.58	142.19
	n	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72
	MAX	1481.00	56.00	92.09	681.00	140.00	1806.00	387.00	167.00	203.00	41.00	64.00	90.00	962.00	414.00	1475.00	157.00
	MIN	1223.00	20.00	78.61	548.00	110.00	1569.00	270.00	145.00	172.00	29.00	46.00	62.00	785.00	352.00	1270.00	131.00
	STD	50.48	9.13	3.40	32.20	6.59	50.93	20.24	4.38	6.68	2.26	4.03	5.58	33.60	15.15	45.74	5.66
2031	AVG	1361.28	30.04	84.70	603.97	120.84	1672.42	296.07	156.94	185.39	34.52	54.51	71.43	870.46	378.71	1360.55	137.97
	n	69	69	69	69	69	69	69	69	69	69	69	69	67	69	69	69
	MAX	1485.00	53.00	91.40	716.00	140.00	1799.00	340.00	170.00	198.00	40.00	66.00	83.00	958.00	422.00	1477.00	150.00
	MIN	1221.00	20.00	78.42	528.00	102.00	1518.00	256.00	143.00	170.00	30.00	43.00	60.00	750.00	331.00	1228.00	123.00
	STD	58.82	7.23	3.01	36.99	7.00	62.46	17.60	5.63	6.08	2.60	3.91	4.78	43.92	16.20	53.12	5.89
2032	AVG	1365.09	31.61	84.13	614.91	121.01	1671.68	300.12	155.92	185.43	35.11	54.18	71.24	858.83	379.20	1358.79	140.45
	n	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76
	MAX	1520.00	44.00	90.61	877.00	137.00	1844.00	333.00	170.00	197.00	42.00	64.00	83.00	961.00	427.00	1516.00	155.00
	MIN	1217.00	23.00	78.17	544.00	108.00	1516.00	272.00	145.00	173.00	30.00	47.00	64.00	733.00	318.00	1216.00	126.00
	STD	63.22	5.40	2.90	47.36	5.79	66.09	14.63	4.59	5.39	2.59	3.55	4.08	46.73	16.59	57.89	5.66
2033	AVG	1369.83	36.03	84.24	620.24	123.69	1670.80	300.43	157.51	187.14	35.91	54.83	72.80	849.74	376.57	1365.80	139.94
	n	35	35	35	34	35	35	35	35	35	35	35	35	35	35	35	35
	MAX	1467.00	46.00	91.53	688.00	134.00	1796.00	340.00	170.00	203.00	40.00	64.00	83.00	951.00	407.00	1470.00	151.00
	MIN	1238.00	23.00	75.88	537.00	113.00	1523.00	268.00	150.00	175.00	31.00	47.00	63.00	735.00	328.00	1236.00	125.00
	STD	59.78	7.13	3.42	37.32	5.27	64.74	16.85	5.54	6.92	2.36	3.79	4.65	47.26	17.48	56.38	5.55
2034	AVG	1355.41	31.70	85.22	616.34	122.21	1657.39	303.33	159.67	187.48	34.97	52.64	70.27	849.91	376.55	1356.03	140.97
	n	32	33	33	32	33	33	33	33	33	33	33	33	32	33	32	33
	MAX	1456.00	49.00	91.76	700.00	133.00	1752.00	327.00	171.00	202.00	41.00	60.00	77.00	902.00	402.00	1434.00	149.00
	MIN	1255.00	19.00	80.69	523.00	108.00	1545.00	252.00	152.00	170.00	29.00	48.00	57.00	771.00	349.00	1250.00	132.00
	STD	47.98	8.42	3.00	36.14	5.91	54.87	16.71	4.61	5.88	2.88	2.36	4.58	33.59	14.30	45.48	4.51
2035	AVG	1368.62	28.72	85.69	624.01	121.00	1672.22	304.35	157.44	183.94	34.50	52.90	70.87	863.82	378.99	1365.78	141.53

Table A-20 (Continued)

ID	STAT	ACH	AGE	CEI	DAH	FAH	HGT	ICB	MCB	MCL	NAB	NAL	NPH	PUH	SHB	STH	ZYB
	n	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68
	MAX	1477.00	50.00	98.09	702.00	137.00	1800.00	380.00	170.00	199.00	42.00	62.00	91.00	996.00	417.00	1471.00	155.00
	MIN	1275.00	20.00	75.00	540.00	106.00	1572.00	270.00	143.00	157.00	30.00	46.00	60.00	774.00	340.00	1283.00	130.00
	STD	56.41	7.09	3.75	35.56	6.34	57.10	19.13	5.14	7.02	2.33	3.53	4.67	44.85	17.82	51.89	5.32
2036	AVG	1363.79	31.91	84.23	621.68	120.81	1663.04	299.96	155.09	184.21	34.53	53.57	71.55	850.06	378.45	1352.45	138.06
	n	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47
	MAX	1475.00	50.00	89.44	674.00	130.00	1791.00	357.00	165.00	197.00	40.00	61.00	83.00	954.00	421.00	1458.00	150.00
	MIN	1232.00	20.00	77.01	537.00	109.00	1499.00	263.00	144.00	173.00	30.00	45.00	65.00	744.00	310.00	1208.00	123.00
	STD	53.88	7.99	2.76	29.65	4.69	55.49	20.13	4.74	5.46	2.25	3.19	3.78	42.35	21.55	51.42	5.27
2037	AVG	1380.38	35.11	84.24	619.18	124.04	1690.20	306.67	157.66	187.25	34.88	55.96	73.93	883.40	390.45	1374.00	141.71
	n	56	56	56	56	56	56	55	56	56	56	56	56	53	56	56	56
	MAX	1516.00	49.00	91.48	688.00	137.00	1847.00	341.00	167.00	199.00	40.00	65.00	83.00	984.00	422.00	1527.00	155.00
	MIN	1283.00	20.00	78.53	540.00	114.00	1585.00	273.00	150.00	176.00	29.00	46.00	68.00	804.00	350.00	1216.00	133.00
	STD	54.89	8.42	2.92	33.84	5.38	58.57	15.74	4.29	4.65	2.70	4.10	3.95	45.43	15.52	56.42	4.68
2038	AVG	1365.13	35.39	84.92	625.74	119.06	1671.48	296.35	157.19	185.35	34.77	52.87	70.03	858.48	367.00	1363.16	138.06
	n	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
	MAX	1482.00	58.00	90.91	874.00	134.00	1792.00	345.00	165.00	202.00	38.00	58.00	83.00	959.00	400.00	1472.00	147.00
	MIN	1295.00	23.00	77.66	566.00	103.00	1588.00	264.00	149.00	170.00	30.00	48.00	60.00	786.00	317.00	1296.00	130.00
	STD	52.96	8.97	3.47	55.07	6.80	58.99	17.04	4.31	8.08	2.14	2.40	5.10	36.41	20.67	49.83	4.54
2039	AVG	1365.02	31.11	85.19	610.51	119.51	1668.81	297.14	157.67	185.16	34.82	53.12	70.79	863.33	374.33	1354.74	137.53
	n	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57
	MAX	1476.00	45.00	94.35	687.00	131.00	1777.00	340.00	171.00	201.00	42.00	62.00	80.00	940.00	423.00	1450.00	151.00
	MIN	1231.00	21.00	79.47	545.00	111.00	1539.00	265.00	150.00	171.00	30.00	46.00	64.00	762.00	190.00	1232.00	127.00
	STD	50.87	6.17	2.91	32.24	4.96	55.46	15.33	5.16	5.31	2.90	3.09	3.82	37.61	29.92	49.33	5.07
2040	AVG	1359.43	33.83	86.70	614.75	120.30	1667.75	303.53	158.75	183.28	34.38	52.28	69.68	860.82	372.43	1356.53	139.68
	n	40	40	40	40	40	40	40	40	40	40	40	40	38	40	40	40
	MAX	1462.00	50.00	93.51	687.00	153.00	1770.00	350.00	173.00	201.00	43.00	64.00	82.00	941.00	423.00	1451.00	170.00
	MIN	1220.00	24.00	79.60	500.00	107.00	1519.00	271.00	141.00	168.00	30.00	47.00	63.00	762.00	320.00	1220.00	123.00
	STD	54.80	8.28	3.80	39.77	7.27	58.29	17.25	6.47	7.51	2.64	4.00	4.39	39.57	23.25	50.28	8.16
2041	AVG	1353.21	38.09	84.99	607.84	119.50	1662.81	300.41	158.13	186.18	34.79	53.22	70.13	852.30	372.44	1351.18	139.85
	n	68	68	68	68	68	68	68	68	68	68	68	68	67	68	68	68
	MAX	1483.00	54.00	94.35	698.00	134.00	1805.00	347.00	170.00	200.00	39.00	60.00	82.00	929.00	409.00	1474.00	153.00
	MIN	1175.00	27.00	78.95	496.00	107.00	1469.00	270.00	150.00	173.00	30.00	42.00	60.00	744.00	314.00	1185.00	124.00
	STD	56.70	5.98	3.13	34.99	5.71	62.61	16.29	5.14	5.70	2.17	3.42	4.21	40.27	16.62	54.68	5.32
2043	AVG	1363.28	31.22	84.93	613.00	120.83	1668.77	297.50	156.80	184.80	35.40	52.17	70.48	861.47	376.63	1360.57	137.10
	n	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	MAX	1446.00	50.00	95.29	678.00	133.00	1758.00	328.00	168.00	197.00	42.00	60.00	81.00	925.00	420.00	1455.00	149.00
	MIN	1262.00	20.00	78.68	512.00	108.00	1572.00	270.00	146.00	170.00	30.00	44.00	60.00	784.00	340.00	1273.00	120.00
	STD	44.20	7.97	3.37	29.38	5.95	46.69	15.23	5.20	6.81	1.95	3.68	3.76	33.06	18.59	41.93	5.56
2044	AVG	1348.44	31.25	84.71	603.88	119.66	1659.22	297.06	157.81	186.47	35.84	53.22	69.06	847.78	371.44	1347.53	139.72
	n	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
	MAX	1465.00	50.00	92.49	678.00	131.00	1824.00	324.00	170.00	201.00	45.00	57.00	74.00	926.00	393.00	1450.00	152.00
	MIN	1256.00	20.00	78.50	550.00	111.00	1540.00	270.00	151.00	173.00	29.00	47.00	62.00	775.00	331.00	1253.00	133.00
	STD	53.07	8.90	3.00	33.52	4.84	64.23	13.92	4.88	7.36	3.41	2.51	3.07	35.11	14.96	50.68	4.77
2045	AVG	1351.08	35.05	84.01	605.68	121.67	1654.59	298.67	154.46	184.03	34.23	53.56	70.05	857.66	377.67	1344.74	135.67
	n	39	39	39	38	39	39	39	39	39	39	39	39	38	39	39	39
	MAX	1490.00	59.00	90.18	666.00	137.00	1790.00	347.00	164.00	200.00	42.00	62.00	91.00	948.00	403.00	1470.00	147.00
	MIN	1285.00	20.00	72.68	542.00	111.00	1582.00	267.00	141.00	163.00	30.00	45.00	60.00	781.00	347.00	1276.00	124.00
	STD	45.73	12.60	3.23	30.63	6.11	45.96	16.62	5.25	7.17	2.73	3.68	5.88	41.86	12.35	43.22	4.83
2046	AVG	1374.51	36.17	86.26	616.49	121.26	1690.26	300.85	158.91	184.34	34.60	53.51	70.38	867.57	371.11	1374.32	139.79
	n	53	53	53	53	53	53	53	53	53	53	53	53	51	53	53	53
	MAX	1513.00	50.00	93.71	706.00	135.00	1832.00	342.00	172.00	204.00	40.00	64.00	82.00	991.00	412.00	1507.00	156.00
	MIN	1259.00	21.00	80.88	536.00	106.00	1564.00	258.00	149.00	168.00	28.00	46.00	61.00	754.00	322.00	1267.00	129.00
	STD	60.25	7.19	2.74	35.68	6.71	62.38	16.29	4.71	6.50	2.21	3.54	4.13	49.20	22.63	54.78	6.55
2047	AVG	1366.90	32.03	84.96	619.31	120.67	1672.03	297.10	157.33	185.31	35.56	53.51	70.08	862.15	372.51	1363.36	139.00
	n	39	38	39	39	39	39	39	39	39	39	39	39	39	39	39	39

Table A-20 (Continued)

ID	STAT	ACH	AGE	CEI	DAH	FAH	HGT	ICB	MCB	MCL	NAB	NAL	NPH	PUH	SHB	STH	ZYB
	MAX	1502.00	50.00	90.96	690.00	131.00	1799.00	340.00	169.00	197.00	41.00	61.00	82.00	958.00	412.00	1472.00	151.00
	MIN	1187.00	20.00	76.92	559.00	111.00	1500.00	260.00	145.00	175.00	28.00	45.00	58.00	716.00	320.00	1197.00	125.00
	STD	67.95	9.53	3.27	30.12	4.65	70.07	17.02	4.90	5.36	2.66	3.63	4.98	54.39	20.02	60.46	6.39
	AVG	1344.50	31.47	85.32	600.63	120.19	1656.41	293.88	158.16	185.53	34.16	54.28	71.34	847.91	369.22	1344.34	139.22
2048	n	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
	MAX	1435.00	47.00	91.26	654.00	129.00	1756.00	320.00	171.00	197.00	40.00	60.00	80.00	910.00	390.00	1414.00	150.00
	MIN	1267.00	21.00	80.20	534.00	108.00	1553.00	272.00	150.00	170.00	30.00	46.00	62.00	766.00	337.00	1269.00	133.00
	STD	48.51	6.97	2.74	30.93	5.94	52.91	11.81	4.59	7.33	2.20	3.27	4.19	36.05	12.23	44.78	4.29
	AVG	1374.17	32.97	84.65	625.93	120.34	1678.24	301.90	158.45	187.31	36.03	53.41	69.07	867.38	373.66	1370.93	139.21
	n	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
	MAX	1501.00	46.00	91.05	686.00	131.00	1821.00	333.00	173.00	199.00	44.00	60.00	79.00	973.00	417.00	1491.00	154.00
	MIN	1288.00	21.00	76.88	570.00	110.00	1581.00	271.00	149.00	170.00	31.00	47.00	61.00	763.00	343.00	1291.00	127.00
2049	STD	53.33	7.35	3.30	26.87	5.54	61.86	18.86	6.47	7.06	3.21	3.03	3.84	46.12	19.06	51.95	5.91
	AVG	1350.56	30.96	84.01	607.27	121.58	1658.41	299.93	155.23	184.89	34.56	55.15	72.79	859.49	378.83	1349.08	137.90
	n	73	73	73	73	73	73	73	73	73	73	73	73	73	72	73	73
	MAX	1466.00	48.00	89.66	696.00	136.00	1768.00	378.00	170.00	205.00	41.00	63.00	85.00	928.00	413.00	1439.00	150.00
2050	MIN	1258.00	21.00	76.59	543.00	110.00	1569.00	265.00	145.00	170.00	31.00	45.00	60.00	766.00	329.00	1270.00	124.00
	STD	44.50	5.56	2.90	32.76	5.66	45.49	18.08	5.22	6.57	2.07	3.48	4.57	32.11	14.97	39.28	4.93
	AVG	1355.67	32.90	85.25	606.24	120.88	1662.84	300.28	156.28	183.41	35.05	54.19	72.55	863.83	378.29	1350.86	136.50
	n	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58
	MAX	1469.00	48.00	91.76	680.00	139.00	1790.00	341.00	170.00	197.00	40.00	62.00	84.00	962.00	417.00	1470.00	151.00
2051	MIN	1222.00	21.00	78.24	530.00	108.00	1536.00	270.00	147.00	174.00	32.00	46.00	64.00	785.00	343.00	1228.00	127.00
	STD	58.57	7.17	3.19	34.07	6.26	63.59	16.24	5.45	5.42	2.12	3.43	4.14	42.91	18.35	56.20	5.25
	AVG	1371.80	34.52	83.99	621.14	121.69	1680.35	305.03	157.42	187.54	34.92	55.43	73.09	868.78	381.57	1368.94	141.89
	n	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65
	MAX	1516.00	54.00	91.26	714.00	134.00	1832.00	393.00	170.00	200.00	40.00	63.00	82.00	962.00	419.00	1509.00	155.00
2052	MIN	1224.00	22.00	75.76	544.00	105.00	1484.00	265.00	143.00	175.00	30.00	46.00	63.00	753.00	345.00	1214.00	129.00
	STD	58.26	8.41	3.08	34.18	5.83	62.62	21.15	5.80	6.63	2.67	3.57	4.17	42.76	18.05	55.64	5.34
	AVG	1350.68	32.56	84.32	602.29	119.50	1661.21	296.50	157.68	187.13	34.61	53.82	69.94	859.24	372.85	1349.87	138.45
	n	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62
	MAX	1446.00	50.00	93.68	680.00	134.00	1777.00	327.00	171.00	200.00	39.00	59.00	78.00	931.00	397.00	1496.00	154.00
2053	MIN	1245.00	21.00	77.00	536.00	107.00	1545.00	267.00	147.00	174.00	30.00	46.00	57.00	776.00	327.00	1250.00	129.00
	STD	47.86	6.92	2.94	30.69	5.29	52.37	13.64	4.59	5.95	2.29	2.92	4.08	37.23	14.85	46.12	4.92
	AVG	1380.68	32.07	86.46	617.95	122.98	1681.30	305.89	158.73	183.64	35.41	55.09	71.82	867.84	375.89	1368.16	138.91
	n	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44
	MAX	1490.00	47.00	96.26	693.00	135.00	1799.00	330.00	180.00	194.00	40.00	60.00	80.00	959.00	404.00	1465.00	154.00
2054	MIN	1206.00	20.00	81.35	533.00	111.00	1507.00	280.00	145.00	167.00	32.00	47.00	62.00	745.00	334.00	1192.00	129.00
	STD	57.05	7.31	3.14	34.36	4.89	59.72	13.32	6.71	6.17	2.16	3.58	4.22	47.88	16.87	54.65	6.01
	AVG	1367.36	28.93	84.46	628.19	118.32	1676.28	298.29	155.65	184.45	33.78	52.14	69.84	858.26	374.97	1360.17	139.19
	n	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
	MAX	1513.00	44.00	91.21	698.00	135.00	1836.00	333.00	168.00	202.00	38.00	60.00	77.00	974.00	412.00	1504.00	155.00
2055	MIN	1268.00	20.00	75.38	552.00	104.00	1560.00	260.00	143.00	170.00	29.00	44.00	60.00	780.00	328.00	1249.00	127.00
	STD	52.50	6.62	3.11	29.86	5.82	57.68	15.77	4.43	6.39	1.87	3.30	3.76	40.13	17.52	51.23	5.75
	AVG	1357.51	34.09	84.71	616.75	119.57	1666.57	301.31	157.08	185.52	34.05	52.69	70.17	861.44	373.45	1351.92	138.98
	n	65	65	65	65	65	65	65	65	65	65	65	65	63	65	65	65
	MAX	1485.00	50.00	91.40	679.00	138.00	1826.00	360.00	170.00	202.00	40.00	60.00	80.00	944.00	408.00	1479.00	150.00
2056	MIN	1200.00	19.00	77.50	514.00	108.00	1502.00	260.00	143.00	175.00	30.00	46.00	63.00	769.00	337.00	1203.00	125.00
	STD	52.31	8.61	2.79	33.48	5.97	57.44	18.65	5.16	5.97	2.25	2.89	3.92	37.06	17.10	50.01	5.63
	AVG	1357.48	32.24	84.29	614.13	119.17	1659.13	296.48	154.87	184.00	34.57	51.43	68.74	860.13	372.65	1349.65	136.00
	n	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
	MAX	1452.00	56.00	92.64	657.00	131.00	1760.00	324.00	165.00	197.00	40.00	57.00	76.00	966.00	403.00	1455.00	149.00
2057	MIN	1270.00	18.00	74.86	570.00	111.00	1565.00	275.00	137.00	163.00	30.00	43.00	62.00	771.00	337.00	1231.00	122.00
	STD	47.95	10.31	4.55	24.20	5.47	53.75	10.87	6.52	7.96	2.33	2.83	3.53	49.40	16.33	54.61	5.66
	AVG	1378.67	34.70	84.49	625.66	129.74	1682.31	300.75	156.10	184.85	34.21	57.31	78.56	874.02	384.36	1372.49	139.52
	n	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61
	MAX	1495.00	49.00	93.82	835.00	143.00	1802.00	338.00	167.00	197.00	40.00	67.00	87.00	988.00	415.00	1478.00	153.00
	STD																

Table A-20 (Continued)

ID	STAT	ACH	AGE	CEI	DAH	FAH	HGT	ICB	MCB	MCL	NAB	NAL	NPH	PUH	SHB	STH	ZYB
2059	MIN	1261.00	20.00	76.14	548.00	118.00	1550.00	272.00	144.00	177.00	30.00	50.00	71.00	775.00	335.00	1236.00	130.00
	STD	53.90	8.16	3.48	42.21	6.04	58.58	16.14	5.54	5.18	1.90	3.77	4.17	43.56	16.87	51.67	5.07
	AVG	1376.63	30.88	84.56	613.35	121.44	1680.14	312.67	159.00	188.19	34.93	53.72	70.00	860.74	378.88	1368.37	141.40
	n	43	43	43	43	43	43	43	43	43	43	43	43	42	43	43	43
	MAX	1540.00	46.00	89.89	716.00	133.00	1840.00	343.00	169.00	205.00	42.00	61.00	78.00	998.00	406.00	1507.00	154.00
2060	MIN	1218.00	20.00	74.33	500.00	113.00	1496.00	291.00	139.00	177.00	24.00	47.00	62.00	768.00	342.00	1217.00	130.00
	STD	61.66	7.60	3.47	41.53	5.46	68.28	14.87	5.55	6.37	3.15	3.25	3.63	47.04	15.44	58.18	5.01
	AVG	1378.43	34.22	85.13	626.53	121.13	1682.60	309.49	159.77	187.81	35.04	52.70	69.38	863.47	378.87	1369.83	141.83
	n	47	46	47	47	47	47	47	47	47	47	47	47	43	47	47	47
	MAX	1515.00	48.00	92.35	714.00	138.00	1830.00	370.00	175.00	200.00	44.00	57.00	81.00	990.00	403.00	1504.00	153.00
2061	MIN	1275.00	22.00	78.68	542.00	105.00	1570.00	268.00	150.00	170.00	31.00	47.00	60.00	780.00	329.00	1268.00	132.00
	STD	54.80	7.71	3.49	34.60	5.78	58.36	20.12	5.96	6.59	2.53	2.67	3.99	46.67	14.94	54.28	5.68
	AVG	1386.78	33.00	85.11	629.92	127.31	1691.66	301.86	156.93	184.49	34.71	55.92	75.34	870.31	385.83	1377.64	139.80
	n	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59
	MAX	1488.00	58.00	92.74	708.00	151.00	1800.00	343.00	166.00	197.00	41.00	65.00	89.00	985.00	422.00	1475.00	150.00
2062	MIN	1287.00	22.00	79.10	584.00	116.00	1579.00	270.00	140.00	172.00	27.00	48.00	65.00	796.00	298.00	1285.00	125.00
	STD	49.62	7.54	3.23	28.24	6.14	57.89	16.19	5.63	5.67	2.33	3.32	4.09	43.09	21.16	49.36	5.71
	AVG	1344.40	31.16	84.63	600.44	121.89	1650.26	298.12	155.47	183.81	34.30	52.98	71.11	845.26	383.60	1340.96	139.14
	n	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57
	MAX	1502.00	48.00	93.02	686.00	134.00	1780.00	332.00	167.00	192.00	41.00	60.00	80.00	991.00	427.00	1481.00	148.00
2063	MIN	1222.00	20.00	78.95	496.00	110.00	1507.00	267.00	143.00	170.00	30.00	45.00	64.00	752.00	348.00	1220.00	130.00
	STD	57.06	6.96	3.04	38.68	5.46	62.48	15.44	4.82	4.80	2.26	3.64	3.45	45.43	18.52	54.82	4.45
	AVG	1352.18	29.52	84.36	615.89	121.61	1653.62	296.08	155.44	184.34	34.25	54.56	71.94	842.30	382.80	1345.82	138.03
	n	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
	MAX	1468.00	46.00	90.91	678.00	155.00	1792.00	342.00	170.00	193.00	46.00	60.00	80.00	912.00	415.00	1460.00	150.00
2064	MIN	1247.00	20.00	78.95	530.00	108.00	1530.00	253.00	144.00	168.00	29.00	47.00	63.00	724.00	343.00	1243.00	130.00
	STD	44.92	6.89	2.78	29.71	7.16	49.23	18.01	4.94	5.17	2.51	3.27	4.21	36.69	15.56	42.15	5.00
	AVG	1347.24	32.56	84.05	610.84	119.37	1647.61	299.11	158.53	188.71	35.11	50.19	67.02	835.44	370.82	1342.02	139.03
	n	62	62	62	61	62	62	62	62	62	62	62	62	59	62	62	62
	MAX	1474.00	49.00	91.26	677.00	133.00	1790.00	333.00	170.00	200.00	41.00	57.00	75.00	954.00	410.00	1476.00	147.00
2065	MIN	1232.00	20.00	77.54	538.00	108.00	1525.00	265.00	145.00	175.00	30.00	41.00	58.00	734.00	337.00	1219.00	125.00
	STD	50.45	8.72	3.13	25.56	4.99	54.44	17.07	5.26	5.17	2.26	3.03	3.60	38.77	15.14	49.46	5.33
	AVG	1368.45	33.62	86.24	618.67	120.90	1687.36	299.93	159.48	185.10	34.78	53.05	70.38	871.84	376.46	1373.84	139.84
	n	58	58	58	58	58	58	58	58	58	58	58	58	57	57	58	58
	MAX	1463.00	48.00	96.26	681.00	134.00	1800.00	350.00	180.00	203.00	38.00	62.00	80.00	985.00	402.00	1467.00	150.00
2066	MIN	1266.00	21.00	75.37	537.00	108.00	1584.00	237.00	143.00	171.00	31.00	46.00	58.00	796.00	327.00	1282.00	127.00
	STD	50.55	7.68	4.17	29.63	6.25	55.39	17.80	6.66	6.62	1.71	4.27	4.46	38.65	15.49	44.85	5.47
	AVG	1354.71	30.94	84.94	604.95	118.70	1667.38	300.29	158.70	186.92	34.11	54.38	70.95	859.75	382.56	1352.76	140.63
	n	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63
	MAX	1466.00	47.00	91.62	679.00	134.00	1804.00	338.00	170.00	205.00	38.00	67.00	81.00	931.00	412.00	1460.00	152.00
2067	MIN	1202.00	20.00	78.61	483.00	109.00	1494.00	207.00	147.00	175.00	29.00	47.00	61.00	767.00	336.00	1214.00	130.00
	STD	51.81	7.48	2.71	32.80	4.33	59.78	18.67	5.30	6.24	2.31	3.84	3.41	38.42	16.72	48.82	5.18
	AVG	1353.09	31.92	83.92	612.58	118.84	1655.44	295.59	155.36	185.33	34.59	52.36	69.66	853.44	379.02	1347.41	138.66
	n	64	64	64	64	64	64	64	64	64	64	64	64	63	64	64	64
	MAX	1474.00	49.00	91.43	686.00	140.00	1773.00	330.00	171.00	200.00	39.00	62.00	81.00	946.00	414.00	1454.00	150.00
2068	MIN	1240.00	21.00	77.72	528.00	105.00	1531.00	268.00	147.00	171.00	30.00	42.00	58.00	774.00	333.00	1243.00	125.00
	STD	50.36	8.12	3.22	33.46	6.54	54.20	14.78	4.59	7.10	2.22	4.05	4.50	39.51	17.01	45.86	5.64
	AVG	1386.26	30.47	84.67	629.34	120.83	1684.09	299.70	156.28	184.75	34.94	51.79	69.74	864.89	378.85	1373.21	140.64
	n	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53
	MAX	1664.00	47.00	92.78	702.00	130.00	1785.00	328.00	167.00	202.00	40.00	61.00	78.00	941.00	435.00	1465.00	150.00
2069	MIN	1270.00	21.00	77.84	566.00	108.00	1580.00	200.00	150.00	174.00	31.00	44.00	63.00	764.00	328.00	1272.00	132.00
	STD	59.52	6.93	3.42	27.63	5.57	48.46	20.36	4.42	5.97	2.07	3.36	3.33	40.24	17.07	43.01	4.30
	AVG	1344.32	35.62	84.63	588.02	119.60	1647.58	298.17	158.88	187.97	35.67	51.68	67.23	823.00	372.12	1338.35	139.80
	n	60	60	60	60	60	60	60	60	60	60	60	60	58	60	60	60
	MAX	1470.00	50.00	93.57	662.00	133.00	1781.00	360.00	171.00	208.00	40.00	60.00	77.00	904.00	420.00	1480.00	153.00
2069	MIN	1218.00	20.00	73.87	503.00	107.00	1495.00	247.00	147.00	171.00	24.00	44.00	60.00	732.00	328.00	1200.00	124.00

Table A-20 (Continued)

ID	STAT	ACH	AGE	CEI	DAH	FAH	HGT	ICB	MCB	MCL	NAB	NAL	NPH	PUH	SHB	STH	ZYB
	STD	57.40	8.40	3.58	37.96	6.52	61.95	19.25	5.14	7.60	2.75	3.41	4.42	42.24	16.65	58.25	5.40
2070	AVG	1355.40	34.23	84.34	607.90	119.88	1657.18	300.50	156.43	185.60	35.50	52.55	69.83	861.58	371.38	1350.98	139.15
	n	40	39	40	40	40	40	40	40	40	40	40	40	40	40	40	40
	MAX	1464.00	46.00	93.68	683.00	134.00	1784.00	328.00	165.00	195.00	47.00	58.00	80.00	940.00	411.00	1465.00	147.00
	MIN	1273.00	20.00	78.53	551.00	106.00	1569.00	260.00	147.00	171.00	29.00	46.00	62.00	800.00	333.00	1268.00	130.00
	STD	46.85	8.46	3.21	29.21	5.42	49.08	16.84	4.37	5.49	3.30	2.80	3.74	31.73	19.13	45.53	4.52
2071	AVG	1365.52	29.69	85.51	617.87	117.95	1677.45	296.35	157.52	184.35	34.24	50.79	67.66	866.86	371.79	1364.61	138.21
	n	62	62	62	62	62	62	62	62	62	62	62	62	59	62	62	62
	MAX	1502.00	49.00	93.44	716.00	134.00	1794.00	345.00	172.00	201.00	41.00	58.00	77.00	952.00	430.00	1490.00	155.00
	MIN	1247.00	21.00	77.37	540.00	107.00	1541.00	260.00	146.00	170.00	30.00	44.00	62.00	771.00	330.00	1246.00	129.00
	STD	52.11	6.15	3.36	33.01	5.48	55.83	17.79	5.40	6.24	2.21	2.91	3.74	40.69	19.17	48.38	5.14
2072	AVG	1378.17	33.96	85.18	621.57	119.19	1687.48	307.45	159.20	187.04	34.45	53.28	70.62	874.75	384.78	1370.90	142.30
	n	69	69	69	69	69	69	69	69	69	69	69	69	68	69	69	69
	MAX	1507.00	54.00	91.67	719.00	133.00	1825.00	357.00	171.00	203.00	45.00	60.00	91.00	970.00	429.00	1479.00	157.00
	MIN	1256.00	22.00	77.34	535.00	108.00	1555.00	270.00	150.00	170.00	30.00	45.00	63.00	780.00	297.00	1255.00	129.00
	STD	56.49	7.86	3.14	37.33	5.78	61.17	17.10	4.90	6.37	2.43	3.12	4.83	41.80	18.56	52.06	5.23
2073	AVG	1362.08	32.30	86.26	614.28	121.53	1670.50	292.00	159.55	185.08	34.08	53.08	71.33	864.64	373.55	1360.83	138.88
	n	40	40	40	40	40	40	40	40	40	40	40	40	39	40	40	40
	MAX	1488.00	49.00	92.78	712.00	135.00	1786.00	331.00	171.00	201.00	38.00	65.00	80.00	970.00	407.00	1461.00	150.00
	MIN	1274.00	21.00	78.38	564.00	113.00	1566.00	272.00	145.00	173.00	31.00	43.00	64.00	780.00	347.00	1268.00	127.00
	STD	50.69	6.38	3.04	33.41	6.09	54.66	14.81	5.44	6.30	2.00	3.94	4.11	42.13	14.57	47.74	4.74
2074	AVG	1364.71	30.26	83.61	628.68	121.87	1670.10	299.39	155.97	186.55	34.10	51.94	71.39	855.74	391.58	1358.90	137.81
	n	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
	MAX	1462.00	43.00	90.16	697.00	136.00	1761.00	327.00	165.00	197.00	37.00	63.00	80.00	931.00	632.00	1441.00	145.00
	MIN	1250.00	20.00	78.95	577.00	109.00	1547.00	265.00	147.00	178.00	30.00	46.00	64.00	766.00	357.00	1249.00	130.00
	STD	50.48	4.86	2.61	31.06	5.71	53.07	15.23	5.92	4.48	1.94	3.74	3.75	38.48	47.90	44.31	3.91
2075	AVG	1378.03	30.90	85.07	616.25	119.85	1686.75	303.03	158.65	186.53	34.80	51.88	67.78	867.75	375.05	1379.38	141.03
	n	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
	MAX	1491.00	51.00	92.35	708.00	133.00	1810.00	335.00	170.00	197.00	41.00	58.00	75.00	973.00	409.00	1490.00	150.00
	MIN	1262.00	21.00	80.10	516.00	105.00	1562.00	273.00	150.00	180.00	30.00	48.00	61.00	766.00	345.00	1272.00	132.00
	STD	50.39	7.88	2.32	41.15	5.37	54.05	14.44	4.91	4.60	2.70	2.65	3.56	42.09	14.94	45.99	4.84
2076	AVG	1368.83	32.00	84.88	621.64	118.61	1664.46	300.07	157.22	185.37	34.52	51.35	69.59	852.64	373.98	1354.91	140.48
	n	46	46	46	45	46	46	46	46	46	46	46	46	45	46	46	46
	MAX	1485.00	49.00	95.40	686.00	130.00	1794.00	340.00	169.00	202.00	40.00	56.00	87.00	940.00	410.00	1460.00	153.00
	MIN	1262.00	20.00	79.19	557.00	107.00	1552.00	260.00	147.00	173.00	30.00	47.00	60.00	782.00	323.00	1255.00	131.00
	STD	50.02	8.97	3.19	32.87	5.48	59.15	18.14	5.54	7.00	2.20	2.21	4.69	38.19	20.47	48.52	5.02
2077	AVG	1363.80	31.00	84.70	621.80	119.73	1665.66	306.83	156.32	184.75	34.51	52.08	69.58	861.78	387.34	1357.41	139.00
	n	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59
	MAX	1522.00	48.00	92.94	688.00	132.00	1816.00	345.00	169.00	200.00	47.00	58.00	77.00	973.00	425.00	1502.00	153.00
	MIN	1250.00	20.00	78.13	564.00	101.00	1546.00	280.00	146.00	165.00	31.00	42.00	57.00	770.00	348.00	1260.00	126.00
	STD	52.36	6.34	3.52	33.66	5.46	53.12	14.87	5.09	6.59	2.62	3.65	3.72	39.17	17.30	48.55	5.69
2078	AVG	1363.27	31.44	84.30	608.92	124.79	1670.63	301.70	157.27	186.73	34.79	55.52	74.48	862.14	383.03	1359.16	140.94
	n	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63
	MAX	1502.00	47.00	95.05	688.00	139.00	1803.00	328.00	173.00	202.00	41.00	66.00	86.00	993.00	421.00	1465.00	152.00
	MIN	1223.00	21.00	76.38	534.00	110.00	1516.00	270.00	147.00	170.00	30.00	46.00	63.00	755.00	340.00	1210.00	133.00
	STD	52.95	6.07	3.63	33.37	6.69	57.66	13.37	5.46	6.67	2.33	4.09	4.94	44.11	15.88	50.77	4.34
2079	AVG	1358.38	31.75	85.29	610.73	118.68	1664.69	298.06	157.16	184.40	34.13	51.63	67.47	848.03	367.68	1353.82	138.46
	n	112	112	112	111	112	112	112	112	112	112	112	112	104	112	112	112
	MAX	1597.00	49.00	94.61	743.00	137.00	1818.00	353.00	171.00	202.00	42.00	73.00	85.00	999.00	420.00	1577.00	157.00
	MIN	1200.00	21.00	75.50	540.00	99.00	1494.00	201.00	145.00	167.00	29.00	40.00	58.00	716.00	323.00	1207.00	127.00
	STD	61.73	6.98	3.15	33.78	5.63	63.05	21.69	5.19	6.29	2.44	4.18	4.75	45.89	16.99	59.13	5.21
2080	AVG	1364.99	36.72	84.56	616.31	123.04	1671.76	304.81	156.83	185.56	35.52	53.56	72.35	852.58	388.36	1358.27	139.55
	n	75	75	75	75	75	75	75	75	75	75	75	75	72	75	75	75
	MAX	1509.00	48.00	91.33	711.00	135.00	1830.00	358.00	168.00	203.00	42.00	61.00	80.00	973.00	492.00	1487.00	152.00
	MIN	1212.00	22.00	77.72	522.00	112.00	1483.00	265.00	145.00	169.00	30.00	45.00	60.00	736.00	348.00	1210.00	126.00
	STD	57.20	6.32	2.72	35.11	5.53	60.74	17.46	4.94	6.16	2.33	3.43	4.42	44.56	21.23	54.04	5.61

Table A-20 (Continued)

ID	STAT	ACH	AGE	CEI	DAH	FAH	HGT	ICB	MCB	MCL	NAB	NAL	NPH	PUH	SHB	STH	ZYB
2081	AVG	1385.87	30.68	84.99	625.90	123.86	1694.12	306.75	157.22	185.12	34.77	53.83	73.09	870.21	385.49	1378.39	140.22
	n	69	69	69	69	69	69	69	69	69	69	69	69	68	69	69	69
	MAX	1525.00	49.00	91.28	711.00	139.00	1844.00	353.00	168.00	198.00	42.00	60.00	84.00	992.00	431.00	1518.00	153.00
	MIN	1280.00	20.00	78.68	557.00	110.00	1553.00	277.00	149.00	172.00	30.00	45.00	63.00	780.00	346.00	1289.00	127.00
2082	STD	55.85	8.32	3.06	36.02	6.48	59.44	15.13	4.50	5.77	2.54	3.28	4.40	44.63	14.13	50.87	4.61
	AVG	1376.37	29.70	84.52	616.78	118.52	1695.40	298.43	156.54	185.35	34.54	53.24	70.27	877.60	376.76	1376.57	137.90
	n	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63
	MAX	1507.00	47.00	91.43	697.00	135.00	1819.00	330.00	167.00	203.00	40.00	60.00	78.00	982.00	409.00	1484.00	152.00
2083	MIN	1259.00	21.00	78.14	545.00	108.00	1562.00	272.00	143.00	173.00	28.00	47.00	61.00	776.00	312.00	1253.00	126.00
	STD	51.56	6.00	3.18	31.31	4.89	54.60	13.35	4.64	5.99	2.26	3.52	3.50	44.72	16.01	49.95	5.10
	AVG	1360.78	29.26	84.80	608.96	119.29	1670.81	295.32	157.67	186.11	34.85	53.04	69.42	863.11	373.60	1357.40	140.46
	n	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72
2084	MAX	1494.00	48.00	92.49	669.00	135.00	1811.00	338.00	166.00	202.00	40.00	84.00	80.00	975.00	421.00	1471.00	153.00
	MIN	1265.00	20.00	75.38	545.00	108.00	1568.00	265.00	148.00	170.00	29.00	43.00	61.00	771.00	340.00	1273.00	132.00
	STD	48.55	6.11	3.29	28.35	5.88	52.43	16.32	4.78	6.76	2.43	5.20	4.37	42.46	16.33	45.14	5.11
	AVG	1377.08	28.25	84.55	623.10	120.52	1681.05	301.13	156.51	185.30	34.79	53.48	72.06	866.23	382.98	1370.71	140.03
2085	n	63	63	63	63	63	63	63	63	63	63	63	63	62	63	63	63
	MAX	1481.00	50.00	94.15	704.00	135.00	1800.00	340.00	168.00	201.00	40.00	68.00	84.00	959.00	425.00	1482.00	148.00
	MIN	1282.00	20.00	77.72	524.00	111.00	1562.00	267.00	147.00	164.00	30.00	44.00	65.00	781.00	322.00	1268.00	130.00
	STD	54.16	6.96	3.39	33.84	5.58	55.16	17.51	4.78	6.95	2.26	4.13	3.85	40.67	19.57	48.44	3.89
2086	AVG	1365.68	30.17	85.42	619.63	123.00	1672.31	303.63	158.25	185.51	34.14	53.51	72.31	858.10	383.08	1360.54	138.68
	n	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59
	MAX	1482.00	49.00	96.53	691.00	142.00	1781.00	365.00	172.00	204.00	40.00	64.00	87.00	920.00	426.00	1464.00	151.00
	MIN	1270.00	20.00	73.06	541.00	107.00	1551.00	273.00	141.00	167.00	30.00	46.00	62.00	780.00	334.00	1270.00	128.00
2087	STD	46.18	7.99	4.25	29.26	6.66	47.76	16.95	6.31	7.57	2.36	3.70	4.40	35.66	18.42	40.42	5.75
	AVG	1365.91	34.53	85.95	614.44	120.06	1676.68	300.44	159.41	185.61	33.89	51.18	68.17	872.37	368.94	1363.00	139.30
	n	66	66	66	66	66	66	66	66	66	66	66	66	63	66	66	66
	MAX	1466.00	50.00	97.30	694.00	133.00	1791.00	330.00	180.00	199.00	38.00	61.00	80.00	958.00	407.00	1462.00	151.00
2088	MIN	1125.00	21.00	76.32	516.00	106.00	1402.00	258.00	145.00	170.00	30.00	40.00	60.00	697.00	306.00	1141.00	124.00
	STD	58.45	8.38	3.55	41.74	6.46	61.92	16.15	5.82	6.26	1.89	4.29	4.68	44.68	17.76	54.04	5.72
	AVG	1385.74	29.22	84.77	636.26	118.36	1692.03	298.16	155.76	183.90	34.67	50.57	67.64	873.69	384.93	1382.55	139.67
	n	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58
2089	MAX	1529.00	54.00	94.83	734.00	137.00	1848.00	331.00	172.00	200.00	43.00	59.00	76.00	984.00	440.00	1506.00	151.00
	MIN	1290.00	20.00	75.13	558.00	102.00	1596.00	273.00	144.00	170.00	30.00	31.00	55.00	797.00	348.00	1301.00	130.00
	STD	50.30	8.29	3.54	31.40	7.01	54.25	14.51	5.63	6.78	2.29	4.66	4.34	41.36	18.45	46.55	4.87
	AVG	1345.97	33.14	84.70	607.24	118.83	1646.41	294.55	156.24	184.66	35.48	52.86	69.31	846.39	363.90	1339.31	135.07
2090	n	29	29	29	29	29	29	29	29	29	29	29	29	28	29	29	29
	MAX	1431.00	47.00	90.80	661.00	133.00	1740.00	327.00	169.00	203.00	41.00	63.00	77.00	894.00	394.00	1410.00	144.00
	MIN	1250.00	24.00	74.38	531.00	108.00	1548.00	273.00	147.00	173.00	29.00	48.00	63.00	750.00	344.00	1250.00	127.00
	STD	45.58	7.52	3.83	32.27	6.28	51.98	13.34	5.05	6.33	2.52	3.13	3.41	33.81	14.45	44.69	4.91
2091	AVG	1368.56	36.80	84.89	623.69	124.28	1677.02	302.32	157.96	186.26	34.84	53.66	72.60	865.72	385.66	1367.64	142.60
	n	50	50	50	49	50	50	50	50	50	50	50	50	43	50	50	50
	MAX	1492.00	51.00	90.80	702.00	136.00	1824.00	336.00	168.00	209.00	42.00	62.00	83.00	954.00	427.00	1504.00	151.00
	MIN	1276.00	24.00	77.99	564.00	110.00	1576.00	272.00	147.00	165.00	30.00	44.00	63.00	792.00	308.00	1284.00	130.00
2092	STD	57.98	6.30	3.10	31.17	5.62	66.51	15.57	4.15	6.84	2.70	3.70	4.82	42.86	18.64	57.12	4.40
	AVG	1359.92	28.81	84.88	604.90	119.38	1666.15	297.98	156.85	184.92	34.65	51.83	70.25	865.19	379.02	1353.67	138.85
	n	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48
	MAX	1507.00	46.00	91.71	704.00	133.00	1831.00	357.00	166.00	201.00	40.00	63.00	82.00	952.00	422.00	1484.00	149.00
2093	MIN	1207.00	20.00	78.11	533.00	102.00	1489.00	260.00	146.00	172.00	29.00	46.00	60.00	753.00	340.00	1194.00	123.00
	STD	51.32	6.06	2.77	36.03	6.26	59.69	17.87	4.49	5.88	2.23	3.64	4.88	39.36	16.40	50.59	5.43
	AVG	1346.33	32.99	84.96	606.69	118.36	1654.67	302.28	156.45	184.27	34.19	51.81	68.97	853.73	380.84	1343.21	138.93
	n	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67
2094	MAX	1472.00	48.00	91.33	717.00	136.00	1781.00	357.00	167.00	202.00	40.00	67.00	81.00	969.00	419.00	1467.00	154.00
	MIN	1164.00	20.00	78.19	514.00	107.00	1508.00	258.00	144.00	168.00	29.00	40.00	58.00	764.00	318.00	1218.00	121.00
	STD	64.67	7.55	2.50	38.70	6.21	65.40	17.80	4.99	6.93	2.24	4.20	4.71	46.59	17.19	56.47	5.37
	AVG	1361.33	31.62	85.05	608.54	119.41	1680.52	299.75	157.92	185.78	34.11	52.21	69.73	865.08	381.56	1367.02	139.75

Table A-20 (Continued)

ID	STAT	ACH	AGE	CEI	DAH	FAH	HGT	ICB	MCB	MCL	NAB	NAL	NPH	PUH	SHB	STH	ZYB
	n	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63
	MAX	1485.00	49.00	91.94	692.00	135.00	1804.00	331.00	171.00	200.00	41.00	61.00	82.00	987.00	419.00	1467.00	155.00
	MIN	1246.00	20.00	78.06	531.00	110.00	1553.00	267.00	143.00	173.00	26.00	47.00	60.00	725.00	347.00	1252.00	127.00
	STD	52.83	5.91	2.98	36.33	5.26	56.59	14.68	5.50	5.77	2.69	3.06	4.40	48.95	15.42	49.48	5.21
2093	AVG	1386.85	29.98	84.81	626.73	121.10	1690.60	304.67	158.70	187.33	34.48	51.98	68.40	875.23	375.75	1381.18	140.85
	n	40	40	40	40	40	40	39	40	40	40	40	40	40	40	40	40
	MAX	1504.00	45.00	100.00	705.00	136.00	1800.00	335.00	183.00	204.00	40.00	61.00	80.00	950.00	403.00	1473.00	150.00
	MIN	1144.00	20.00	77.89	431.00	103.00	1408.00	271.00	149.00	173.00	31.00	44.00	60.00	744.00	351.00	1113.00	130.00
	STD	65.78	5.97	4.25	45.99	7.10	72.65	16.09	6.51	7.26	2.15	3.27	4.82	46.09	14.61	65.94	4.14
2094	AVG	1356.53	32.91	84.68	616.06	122.66	1664.52	296.00	156.11	184.44	33.95	53.78	72.48	851.66	378.25	1354.09	138.89
	n	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
	MAX	1513.00	57.00	90.91	695.00	135.00	1826.00	340.00	168.00	195.00	39.00	61.00	82.00	994.00	425.00	1490.00	153.00
	MIN	1230.00	20.00	78.19	532.00	113.00	1554.00	265.00	146.00	175.00	30.00	45.00	61.00	772.00	330.00	1253.00	130.00
	STD	54.69	8.27	2.76	31.96	5.92	58.64	15.96	4.38	4.78	2.10	3.71	4.64	43.37	18.09	50.69	4.77
2095	AVG	1369.39	33.70	83.96	609.88	120.46	1680.52	300.45	156.70	186.83	34.39	52.65	70.58	869.00	376.15	1363.91	138.38
	n	69	69	69	68	69	69	69	69	69	69	69	69	69	68	69	69
	MAX	1495.00	49.00	96.45	694.00	132.00	1812.00	331.00	172.00	203.00	39.00	60.00	80.00	962.00	420.00	1492.00	153.00
	MIN	1228.00	20.00	76.68	514.00	103.00	1522.00	248.00	146.00	169.00	25.00	45.00	61.00	769.00	330.00	1229.00	126.00
	STD	53.74	7.21	3.97	36.52	5.51	57.60	14.69	5.75	6.63	2.53	3.45	3.96	38.32	16.36	51.24	5.26
2097	AVG	1366.09	31.04	84.93	613.65	119.50	1678.93	302.85	157.31	185.33	34.28	53.03	70.80	863.44	380.56	1364.81	137.89
	n	79	80	80	79	80	80	79	80	80	80	80	80	79	80	79	80
	MAX	1477.00	47.00	92.47	725.00	130.00	1801.00	352.00	173.00	199.00	40.00	59.00	80.00	940.00	405.00	1472.00	151.00
	MIN	1226.00	20.00	77.37	518.00	108.00	1517.00	270.00	143.00	172.00	28.00	44.00	63.00	768.00	343.00	1234.00	127.00
	STD	54.39	6.10	3.17	38.96	5.32	55.57	15.85	5.41	5.62	2.72	2.69	4.09	37.08	14.48	48.75	5.43
2098	AVG	1362.12	29.85	85.60	607.10	120.12	1667.73	305.22	158.22	184.95	35.05	50.41	67.66	858.73	370.98	1357.66	140.44
	n	41	41	41	41	41	41	41	41	41	41	41	41	40	41	41	41
	MAX	1525.00	49.00	93.44	703.00	133.00	1842.00	364.00	172.00	196.00	43.00	60.00	75.00	952.00	404.00	1500.00	155.00
	MIN	1269.00	20.00	79.27	540.00	108.00	1561.00	273.00	140.00	157.00	30.00	41.00	60.00	770.00	341.00	1268.00	127.00
	STD	63.12	9.06	3.21	40.94	5.59	64.58	20.27	6.36	7.06	2.48	3.71	3.65	48.23	16.57	57.02	5.67
2099	AVG	1372.44	30.84	85.36	621.03	122.39	1675.95	299.85	157.82	185.02	34.11	54.26	71.64	864.89	384.93	1361.92	140.51
	n	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61
	MAX	1490.00	47.00	93.22	716.00	144.00	1824.00	360.00	167.00	197.00	40.00	64.00	85.00	968.00	427.00	1488.00	150.00
	MIN	1264.00	21.00	78.97	546.00	107.00	1561.00	268.00	147.00	170.00	29.00	47.00	60.00	780.00	301.00	1265.00	130.00
	STD	58.36	6.90	3.28	35.77	6.43	61.22	17.16	4.71	5.12	2.60	3.97	5.07	44.35	20.16	52.73	4.72
2100	AVG	1356.43	30.24	84.76	610.26	124.90	1658.22	299.41	155.45	183.52	35.43	53.81	73.64	855.05	382.02	1347.66	137.48
	n	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58
	MAX	1571.00	48.00	94.44	705.00	144.00	1874.00	340.00	169.00	194.00	43.00	62.00	83.00	1003.00	421.00	1553.00	150.00
	MIN	1256.00	20.00	78.72	522.00	112.00	1545.00	263.00	147.00	162.00	31.00	46.00	64.00	786.00	347.00	1252.00	116.00
	STD	59.67	6.35	3.03	34.10	6.37	63.41	15.03	5.29	6.03	2.11	3.73	4.32	47.12	16.84	56.13	6.02
2101	AVG	1377.07	32.46	83.99	622.39	120.59	1678.20	302.80	155.91	185.76	34.67	53.85	70.67	862.54	376.54	1367.30	138.83
	n	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46
	MAX	1472.00	55.00	90.96	684.00	130.00	1776.00	340.00	164.00	204.00	41.00	60.00	78.00	951.00	420.00	1452.00	147.00
	MIN	1181.00	19.00	77.42	500.00	110.00	1507.00	270.00	144.00	171.00	30.00	48.00	60.00	740.00	310.00	1194.00	128.00
	STD	57.13	8.80	3.02	35.22	4.97	57.57	15.37	4.72	6.09	1.92	2.97	3.89	40.14	20.53	50.41	5.11
2102	AVG	1372.83	29.15	85.22	616.98	119.80	1678.68	301.48	158.78	186.45	34.78	51.48	69.70	871.13	373.50	1365.03	137.70
	n	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
	MAX	1491.00	44.00	91.62	669.00	136.00	1820.00	342.00	175.00	200.00	43.00	58.00	78.00	952.00	403.00	1490.00	145.00
	MIN	1257.00	21.00	78.38	551.00	111.00	1574.00	271.00	145.00	174.00	29.00	46.00	63.00	684.00	337.00	1280.00	130.00
	STD	54.47	6.21	3.75	31.73	5.39	57.94	15.22	6.50	6.76	3.35	3.21	3.01	49.53	17.19	49.95	4.09
Total	AVG	1363.72	32.32	84.82	614.95	121.04	1670.64	300.24	157.21	185.49	34.65	53.13	70.74	859.96	377.63	1359.35	139.32
	COUNT	5414.00	5411.00	5416.00	5399.00	5416.00	5416.00	5412.00	5416.00	5416.00	5416.00	5416.00	5416.00	5345.00	5412.00	5414.00	5416.00
	MAX	1664.00	64.00	100.00	877.00	155.00	1939.00	393.00	183.00	209.00	47.00	84.00	91.00	1003.00	632.00	1633.00	170.00
	MIN	1125.00	18.00	72.68	431.00	99.00	1402.00	200.00	137.00	157.00	22.00	31.00	55.00	616.00	190.00	1113.00	116.00
	STD	54.22	7.81	3.27	34.63	6.25	58.30	16.85	5.30	6.32	2.41	3.80	4.74	42.80	18.51	51.36	5.42

Table A- 21. Summary Statistics for Males from Mazury (Miszkiewicz, 1956).

<i>ID</i>	<i>STAT</i>	<i>AGE</i>	<i>BIB</i>	<i>CEI</i>	<i>CMB</i>	<i>FAH</i>	<i>HGT</i>	<i>MCB</i>	<i>MCL</i>	<i>NAB</i>	<i>NAL</i>	<i>NPH</i>	<i>WFB</i>	<i>YOB</i>	<i>ZYB</i>
3	AVG	36.25	110.12	82.03	133.38	122.32	1695.86	156.22	190.54	33.82	56.31	77.05	109.2	1917.75	142.4
	n	65	65	65	65	65	58	65	65	65	65	65	65	65	65
	MAX	86	123	90	143	146	1870	171	212	42	65	92	122	1936	155
	MIN	18	96	72.45	122	105	1590	142	177	28	46	68	98	1868	128
	STD	21.74	5.93	3.46	4.84	7.37	58.7	6.6	6.18	3.01	4.78	5.37	4.6	21.74	5.68
4	AVG	43.36	111.48	82.16	135.05	121.6	1697.33	156.92	191.12	35.2	55.32	75.98	112.14	1910.8	142.34
	n	50	50	50	39	50	45	50	50	50	50	50	50	50	50
	MAX	84	128	87.43	152	135	1820	177	208	43	66	88	127	1936	158
	MIN	18	102	75.51	118	107	1530	144	170	29	46	62	102	1870	126
	STD	24.97	6.38	3.18	6.8	7.46	64.36	6.92	7.91	3.28	4.27	5.27	5.71	24.88	7.53
5	AVG	52.13	109.63	82.24	136.75	122.25	1687.14	157.25	191.25	34.38	56.38	78.63	111.13	1901.88	145.5
	n	8	8	8	8	8	7	8	8	8	8	8	8	8	8
	MAX	86	119	89.25	145	135	1760	166	200	38	64	86	119	1935	156
	MIN	19	104	78.92	127	109	1600	146	185	28	49	71	102	1868	135
	STD	28.29	5.13	3.12	6.16	8.38	62.37	6.48	5.12	3.16	5.32	5.04	5.28	28.29	6.76
6	AVG	34.4	111.4	81.52	134.9	123.3	1720	156.4	192.1	34.8	54.2	76.3	111.5	1919.6	144.6
	n	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	MAX	73	118	88.95	148	133	1850	167	210	37	59	85	118	1936	153
	MIN	18	108	74.21	121	112	1570	141	181	31	44	68	106	1881	136
	STD	18.72	3.66	4.46	7.65	6.29	77.6	6.55	8.13	2.1	4.78	4.69	3.27	18.72	5.82
7	AVG	53.15	111.46	82.47	135.77	123.54	1672	158.85	192.69	34.54	55.92	77.69	111.38	1900.85	146.31
	n	13	13	13	13	13	10	13	13	13	13	13	13	13	13
	MAX	87	120	87.43	144	132	1850	167	203	44	62	83	122	1934	161
	MIN	20	106	77.89	124	106	1580	152	181	30	51	73	102	1867	140
	STD	24.81	4.56	3.22	6.64	6.86	71.77	5.46	5.06	3.95	3.73	3.75	5.44	24.81	6.55
8	AVG	73.38	110.13	81.09	131.71	123.25	1630	153.63	189.38	35.13	54.5	77.25	106.25	1880.63	141.38
	n	8	8	8	7	8	7	8	8	8	8	8	8	8	8
	MAX	91	119	84.97	145	130	1720	164	197	39	59	81	118	1901	150
	MIN	53	97	78.14	126	115	1550	143	182	29	50	73	96	1863	133
	STD	12.61	6.64	2.31	7.27	4.71	57.15	7.96	5.88	3.09	3.25	3.01	6.3	12.61	5.42
9	AVG	50	115.5	82.49	138	121.75	1733.33	161.25	195.5	32.75	55.5	79.25	107.75	1904	143.5
	n	4	4	4	4	4	3	4	4	4	4	4	4	4	4
	MAX	89	126	84.24	143	132	1740	171	203	35	68	91	114	1931	151
	MIN	23	104	79.9	132	113	1730	154	185	28	49	70	102	1865	138
	STD	32.26	9.57	1.86	4.69	7.85	5.77	7.14	7.72	3.2	8.5	9.03	5.32	32.26	6.56
10	AVG	81.11	110.56	80.09	134.22	119.44	1820	154.22	192.78	37.67	55	74.89	108.89	1872.89	142.56
	n	9	9	9	9	9	1	9	9	9	9	9	9	9	9
	MAX	89	118	85.64	146	128	1820	163	202	45	59	81	118	1884	153

Table A-21 (Continued)

ID	STAT	AGE	BIB	CEI	CMB	FAH	HGT	MCB	MCL	NAB	NAL	NPH	WFB	YOB	ZYB
	MIN	70	107	66.5	118	107	1820	133	186	31	51	67	98	1865	132
	STD	6.17	3.88	5.65	8.7	5.79	-	8.96	5.67	4.18	3.71	4.08	6.23	6.17	7.28
11	AVG	68	111	83.35	131	118	1560	155	186.33	35.67	53.33	73	109.33	1886	141.33
	n	3	3	3	3	3	1	3	3	3	3	3	3	3	3
	MAX	80	117	88.64	136	131	1560	156	196	39	56	79	114	1897	143
	MIN	57	102	79.59	123	106	1560	153	176	33	51	68	107	1874	140
	STD	11.53	7.94	4.71	7	12.53	-	1.73	10.02	3.06	2.52	5.57	4.04	11.53	1.53
12	AVG	44	115.5	81.85	138.5	123.62	1665.5	156.23	190.92	34.23	53.62	75.77	107.5	1910.69	141
	n	13	4	13	4	13	12	13	13	13	13	13	4	13	13
	MAX	78	120	85.79	152	133	1772	172	202	39	60	82	111	1935	151
	MIN	20	112	77.39	131	114	1571	148	181	32	47	70	104	1876	135
	STD	17.61	3.32	2.67	9.68	5.16	69.95	6.65	6.74	2.45	4.05	3.52	3.51	17.95	5.37
13	AVG	32.67		81.36		120.17	1689.67	154.67	190.17	32.83	56	76.17		1922.33	138.5
	n	6		6		6	6	6	6	6	6	6		6	6
	MAX	45		86.17		133	1733	162	198	36	80	95		1931	143
	MIN	24		77.27		105	1653	148	184	32	42	63		1910	132
	STD	7.26		2.89		9.75	32.57	5.28	5.46	1.6	12.7	10.61		7.26	5.24
14	AVG	27.75		80.55		120.75	1637	152.25	189.25	33.25	52	74.25		1927.25	138.5
	n	4		4		4	4	4	4	4	4	4		4	4
	MAX	35		86.41		133	1689	159	199	35	57	84		1935	145
	MIN	20		75.13		112	1556	142	184	31	47	68		1920	132
	STD	6.6		5.4		9.39	57.88	7.27	6.85	1.71	4.4	7.76		6.6	6.95
22	AVG	33	113	82.06	138.67	119.25	1666.75	158.75	193.5	34.25	51.5	76.25	110.67	1921.25	146
	n	4	3	4	3	4	4	4	4	4	4	4	3	4	4
	MAX	57	119	84.9	142	129	1700	163	198	35	55	83	113	1935	149
	MIN	19	108	79.8	134	109	1627	157	192	33	46	70	108	1898	142
	STD	16.63	5.57	2.11	4.16	8.42	30.04	2.87	3	0.96	4.36	5.56	2.52	16.15	2.94
Total	AVG	44.2	110.98	81.92	134.48	122.02	1689.28	156.43	191.08	34.52	55.36	76.55	110.21	1909.94	142.63
	n	197	177	197	165	197	168	197	197	197	197	197	177	197	197
	MAX	91	128	90	152	146	1870	177	212	45	80	95	127	1936	161
	MIN	18	96	66.5	118	105	1530	133	170	28	42	62	96	1863	126
	STD	24.39	5.83	3.4	6.24	7.17	64.56	6.66	6.64	3.15	4.9	5.27	5.25	24.41	6.37

Table A- 22. Summary Statistics for Males from Warmia (Miszkievicz, 1960).

ID	TYPE	AGE	CEI	FAH	HGT	MCB	MCL	NAB	NAL	NPH	YOB	ZYB
10	AVG	32.81	83.02	123.65	1708.59	156.92	189.18	34.94	54.42	77.32	1921.19	141.38
	n	95	95	95	56	95	95	95	95	95	95	95
	MAX	75.00	89.50	138.00	1860.00	168.00	203.00	72.00	64.00	88.00	1936.00	156.00
	MIN	18.00	76.14	98.00	1585.00	146.00	176.00	28.00	37.00	57.00	1879.00	128.00
	STD	14.77	3.30	6.42	47.13	4.91	6.22	4.89	4.50	5.08	14.77	4.88
16	AVG	35.86	82.10	124.21	1679.19	156.35	190.54	34.72	55.70	78.15	1918.14	141.93
	n	110	110	110	72	110	110	110	110	110	110	110
	MAX	76.00	92.59	142.00	1830.00	175.00	205.00	48.00	67.00	92.00	1936.00	158.00
	MIN	18.00	72.28	108.00	1511.00	143.00	175.00	29.00	48.00	68.00	1878.00	123.00
	STD	17.59	2.98	7.27	62.51	5.44	5.90	3.08	4.33	5.07	17.59	6.18
17	AVG	38.59	82.75	119.73	1686.69	155.36	187.86	34.50	53.41	74.64	1915.41	140.00
	n	22	22	22	13	22	22	22	22	22	22	22
	MAX	81.00	88.04	130.00	1775.00	164.00	200.00	40.00	59.00	83.00	1936.00	151.00
	MIN	18.00	74.62	109.00	1513.00	144.00	173.00	29.00	47.00	67.00	1873.00	126.00
	STD	21.00	3.16	5.42	76.76	6.18	6.97	2.48	2.87	4.57	21.00	6.22
18	AVG	55.00	81.86	120.43	1627.75	157.57	192.71	38.43	57.14	79.71	1899.00	143.86
	n	7	7	7	4	7	7	7	7	7	7	7
	MAX	69.00	91.49	132.00	1711.00	172.00	204.00	44.00	61.00	84.00	1911.00	150.00
	MIN	43.00	75.88	111.00	1576.00	151.00	185.00	32.00	48.00	73.00	1885.00	138.00
	STD	8.50	4.84	7.14	58.04	7.14	6.87	4.31	4.60	3.59	8.50	5.30
19	AVG	33.00	89.80	122.00		176.00	196.00	33.00	57.00	77.00	1921.00	151.00
	n	1	1	1		1	1	1	1	1	1	1
	MAX	33.00	89.80	122.00		176.00	196.00	33.00	57.00	77.00	1921.00	151.00
	MIN	33.00	89.80	122.00		176.00	196.00	33.00	57.00	77.00	1921.00	151.00
	STD	-	-	-		-	-	-	-	-	-	-
20	AVG	36.25	82.08	121.26	1686.07	155.52	189.65	34.23	53.91	76.67	1917.75	141.97
	n	150	150	150	150	150	150	150	150	150	150	150
	MAX	70.00	91.57	142.00	1903.00	171.00	205.00	41.00	65.00	90.00	1936.00	154.00
	MIN	18.00	74.11	105.00	1542.00	141.00	170.00	27.00	42.00	64.00	1884.00	128.00
	STD	12.80	3.63	6.49	55.68	5.70	6.52	2.76	4.08	4.36	12.80	5.44
21	AVG	34.82	82.02	121.09	1719.91	156.82	191.27	33.36	53.82	76.73	1919.18	138.55
	n	11	11	11	11	11	11	11	11	11	11	11
	MAX	54.00	84.90	127.00	1853.00	165.00	205.00	36.00	60.00	81.00	1936.00	153.00
	MIN	18.00	79.69	111.00	1650.00	153.00	182.00	30.00	48.00	68.00	1900.00	131.00
	STD	12.32	1.78	4.81	56.69	4.02	6.36	1.96	3.12	4.03	12.32	5.84
22	AVG	38.10	82.81	122.40	1668.70	157.80	190.60	34.30	53.70	77.10	1915.90	143.80
	n	10	10	10	10	10	10	10	10	10	10	10
	MAX	52.00	85.49	132.00	1751.00	168.00	201.00	37.00	58.00	85.00	1935.00	152.00
	MIN	19.00	75.26	110.00	1544.00	143.00	176.00	32.00	44.00	68.00	1902.00	132.00
	STD	11.81	3.26	6.85	65.21	8.59	8.07	1.49	4.08	4.86	11.81	6.00

Table A-22 (Continued)

<i>ID</i>	<i>TYPE</i>	<i>AGE</i>	<i>CEI</i>	<i>FAH</i>	<i>HGT</i>	<i>MCB</i>	<i>MCL</i>	<i>NAB</i>	<i>NAL</i>	<i>NPH</i>	<i>YOB</i>	<i>ZYB</i>
23	AVG	41.50	80.16	128.00	1694.00	153.50	191.50	34.50	54.00	79.00	1912.50	141.00
	n	2	2	2	2	2	2	2	2	2	2	2
	MAX	55.00	81.05	134.00	1720.00	154.00	193.00	36.00	56.00	82.00	1926.00	142.00
	MIN	28.00	79.27	122.00	1668.00	153.00	190.00	33.00	52.00	76.00	1899.00	140.00
24	STD	19.09	1.26	8.49	36.77	0.71	2.12	2.12	2.83	4.24	19.09	1.41
	AVG	38.00	83.77	124.00	1704.50	156.33	186.83	34.67	54.00	77.83	1916.00	143.50
	n	6	6	6	6	6	6	6	6	6	6	6
	MAX	64.00	88.83	134.00	1828.00	159.00	197.00	41.00	60.00	83.00	1936.00	154.00
Total	MIN	18.00	80.20	110.00	1629.00	152.00	179.00	30.00	46.00	71.00	1890.00	133.00
	STD	17.26	3.25	7.97	68.17	2.42	7.47	3.93	5.62	4.54	17.26	8.02
	AVG	35.85	82.38	122.59	1688.74	156.23	189.78	34.59	54.53	77.19	1918.15	141.74
	n	414	414	414	324	414	414	414	414	414	414	414
Total	MAX	81.00	92.59	142.00	1903.00	176.00	205.00	72.00	67.00	92.00	1936.00	158.00
	MIN	18.00	72.28	98.00	1511.00	141.00	170.00	27.00	37.00	57.00	1873.00	123.00
	STD	15.30	3.35	6.76	58.31	5.58	6.36	3.46	4.25	4.78	15.30	5.65

Table A- 23. Summary Statistics for Males from Boas' Immigrant Study (Boas, 1928).

<i>ID</i>	<i>STAT</i>	<i>AGE</i>	<i>CEI</i>	<i>HGT</i>	<i>MCB</i>	<i>MCL</i>	<i>YOB</i>	<i>ZYB</i>
Boas	AVG	37.01	82.03	1656.79	155.34	189.55	1872.99	141.90
	n	110	110	110	110	110	110	110
	MAX	59.00	90.06	1770.00	167.00	207.00	1892.00	167.00
	MIN	18.00	73.89	1365.00	144.00	176.00	1851.00	126.00
Boas	STD	9.00	3.66	69.25	5.50	6.61	9.00	5.98

VITA

Alicja Karolina Lanfear was born in Melbourne, Australia to Elżbieta and Stanisław Kutyla who were recent immigrants from Poland. Soon after graduating high school Alicja was awarded an athletic scholarship to attend university in the United States. In 2006 Alicja graduated from Cumberland University (Lebanon, TN) with a Bachelor of Science degree (*cum laude*) majoring in biology with chemistry and anthropology minors. During her undergraduate career Alicja was awarded Cumberland University's Most Promising Biologist Award (2006), the J.O. Baird Chemistry Award (2005) for her work in organic chemistry, and the MVP Award as the captain of the women's tennis team (2006).

In 2006 Alicja was awarded a graduate teaching assistantship at Middle Tennessee State University and began her Master of Science degree in Biology. Under the tutelage of her mentor Hugh E. Berryman, PhD-DABFA and committee chair Judith Shardo, PhD, Alicja began her training as a skeletal biologist and set her goal to become a well-rounded biological anthropologist with an interest in forensics. She was awarded the Smithsonian Graduate Student Fellowship and several scholarships from the biology department at MTSU to support her thesis research. Alicja graduated from MTSU in 2008 with her master's degree.

In 2008 Alicja was awarded a graduate teaching assistantship at The University of Tennessee, Knoxville and began her Doctor of Philosophy degree in Biological Anthropology. Also in 2008, Alicja and Hugh Berryman were awarded the Physical Anthropology Section's Ellis R. Kerley Award for their presentation of primer-derived gunshot residue research at the 60th Annual Meeting of American Academy of Forensic Sciences. In 2012 under the guidance of Richard L. Jantz, PhD, Alicja earned a Doctor of Philosophy at The University of Tennessee, Knoxville in Biological Anthropology and a Minor in Statistics.