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Reference values for areal bone mineral density among a healthy Mexican population

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Salud Publica Mex 2009;51 suppl 1:S56-S83.

Abstract

Objective. Compare the influence of ethnicity in the prevalence of osteopenia and osteoporosis in various Mexican populations using two normal dual X-ray absorptiometry (DXA) reference databases: manufacturer's incorporating US Hispanic population and a normal mestizo Mexican population. **Material and Methods.** MMP included 9 946 subjects participating in an ongoing long-term cohort study focusing on lifestyle and chronic diseases, of which 6 487 MMP males and females aged 7 to 80 years were the normal subjects used to determine bone density T- and Z-scores, following WHO criteria, and peak bone mass values. Abnormal bone mass density values estimated by the manufacturer's and peak bone mass reference values were compared. **Results and Conclusions.** Our results show that by using the manufacturer's T-score values in the mestizo Mexican population we are underestimating the number of abnormal bone mass BMD populations.

Key words: bone densitometry, normal reference values, ethnicity, Mexico

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Valores de referencia para la densidad mineral ósea expresada en área para una población mexicana sana.
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Resumen

Objetivo. Comparar la influencia de la etnicidad en la prevalencia de osteopenia y osteoporosis en varias poblaciones mexicanas utilizando dos bases de referencia normal de densitometría de rayos X (DXA): referencia del fabricante que incorpora hispanos en Estados Unidos y datos de una población mestiza mexicana. **Material y métodos.** Un total de 9 946 sujetos de población mestiza mexicana participantes en una cohorte de largo plazo dirigida al estudio de estilos de vida y ocurrencia de enfermedades crónicas; de los cuales 6 487 sujetos sanos de ambos sexos, con edad entre los 7 y los 80 años, fueron utilizados para determinar los valores T, Z, de acuerdo a los criterios de la OMS, así como a los valores de masa ósea pico. Se compararon los casos de densidad mineral ósea anormal de acuerdo a los valores de referencia del fabricante y los valores de masa ósea pico de la población mestiza. **Resultados y conclusión.** Las bases de referencia del fabricante subestima significativamente el número de casos con densidad mineral ósea anormal en la población mestiza mexicana.

Palabras clave: densitometría ósea, valores normales referencia, etnicidad; México

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Osteoporosis and its most common complication, fragility fractures, are well recognized internationally as public health problems.¹⁻⁶ Mexico is no exception, as femoral fractures account for nearly 40 000 hip replacement surgeries performed in the nation each year⁷⁻¹³ with an estimated direct cost of 800 000 US dollars. In 1994, the World Health Organization (WHO) developed criteria to classify bone mineral density (BMD) values as an estimation of lifelong relative fracture risk¹⁴ and to classify people as osteopenic or osteoporotic based on the low energy dual x-ray absorptiometry (DXA) T-score values of healthy young adults (20 to 40 years old). BMD is influenced by genetic and lifestyle factors which may significantly vary between ethnic groups. BMD reference values for the US Hispanic population are available from the National Health and Nutrition Examination Survey (NAHNES) and can be found in clinical equipment software. However, there are no such reference values available for the healthy Mexican population, which is ethnically distinct from the US Hispanic population.

Over the last 15 years, DXA has been widely used to determine bone mineral density (BMD) at different anatomical sites. This technology has been used for early detection of individuals at high risk of osteoporotic fractures. According to these WHO criteria, T-scores should be developed based on mean BMD values \pm standard deviation (SD) among a reference population of healthy young adults (20 to 40 years old). These criteria have been adopted as the optimal bone strength reference values to qualify as osteopenic or osteoporotic, based on the BMD evaluation. A T-score value above 1.0 SD is considered normal, between -1.0 and -2.5 SD as osteopenia, and below -2.5 as osteoporosis.¹⁴⁻¹⁶ A Z-score was also developed as a comparison for BMD determinations against age- and gender-matched healthy individuals. The lifelong relative fracture risk for the osteopenic range increased to 1.6 and it was over 2.0 for the osteoporotic range. The prediction is stronger if data is analyzed for the specific region of interest, namely, if one measures femoral neck results to predict the relative risk of having a femoral neck fracture; in such an example the relative risk increases to over 2 for an osteopenic BMD value and to over 6 for osteoporotic values.¹⁴

In order to minimize the differences between reference populations, researchers sought to generate BMD reference values for different ethnic groups in the United States based on National Health and Nutrition Examination Survey (NHANES) data.¹⁷⁻¹⁹ T-scores for Hologic and Lunar instruments have thus been developed for specific anatomical regions among 20 to 40 year-old healthy adult men and women and for different ethnici-

ties. During the last 10 years, these estimates have been used as reference values for operational and diagnostic purposes at the clinical level.

In recent years, the use of BMD T-score values for different ethnic groups and countries has been questioned in light of increasing evidence that the true maximal bone strength at skeletal maturity is the peak bone mass (PBM), representing the optimal bone mass of an individual.²⁰ It is now believed that a T-score computed using this optimal bone strength value (PBM) may be a better reference than the mean of a healthy young adult population because bone mass is still increasing²¹⁻²² in individuals between 20 and 30 years of age. Therefore, including sub-optimal BMD estimates in the calculation of T-scores may lead to a significant underestimation of osteopenic and/or osteoporotic cases.

BMD is the strongest predictive factor of fractures that can be assessed with high reproducibility and specificity.²²⁻²⁶ To use this predictor in Mexico, it is thus crucial to have reference PBM values for the Mexican population in order to compute a T-score that truly reflects optimal bone strength at skeletal maturity. Adopting national standards based on BMD reference values and T-score estimates for our population may improve the assessment of osteoporosis in Mexico. Since anti-fracture interventions provide over 50 percent protection against osteoporotic fractures after the first year of treatment, improved ability to assess fracture risk would improve both public health decision making and clinical outcomes.³

The aim of the study is to provide BMD reference values based on a healthy, urban Mexican population aged 7 to 80 years and stratified by sex, enabling us to estimate the PBM reference values for the Mexican population. These values are necessary for computing a T-score that truly reflects optimal bone strength at skeletal maturity in this population. Using these BMD reference values, we are able to calculate optimal BMD T- and Z-scores, both according to WHO criteria and PBM values. Adopting these reference values as a national standard can improve public health practices and clinical assessment of osteoporosis in Mexico.

Material and Methods

Study Population: The present analysis was performed with healthy employees and their healthy relatives from three different health and academic institutions: Instituto Mexicano del Seguro Social (IMSS) and the Instituto Nacional de Salud Pública (INSP) in Cuernavaca, Morelos, Mexico, and employees from the Universidad Autónoma del Estado de México (UAEM) in Toluca, State of Mexico. Subjects recruited for the study were

participating in the first stage of an ongoing, long-term cohort study focusing on lifestyle and health, approved by the respective ethical committees of each participating institution; informed consent was obtained in all cases. Out of a total population of 13 275 study candidates identified between March 2004 and April 2006, 9 467 employees were invited to participate in the cohort study and a total of 8 307 adults were formally enrolled. Those participants who were parents of children 7 to 18 years of age (about 20% of the employees) were also asked to invite their children to be part of the study. Of those willing to participate, 1 639 youths were formally invited and enrolled in the study. Thus, a total of 9 946 subjects between 7 and 92 years of age were formally recruited. BMD determinations in this study population constitute part of a more extensive epidemiologic evaluation designed to prospectively evaluate different hypotheses about the relationships between lifestyle and chronic disease occurrence in Mexico.

For the present analysis, we excluded subjects older than 80 years of age as well as participants with chronic diseases that may affect bone metabolism and/or alter the BMD values, such as: diabetes (n=631), cancer (n=96), obesity (BMI ≥ 35 , n=262), arthritis (n=286), kidney stones (n=182), renal dysfunction (creatinine >2 mg/dL for men, >1.8 mg/dL for females, n=283) previously diagnosed osteopenia/osteoporosis or fractures after the age of 45 (n=64), use of medications that may alter bone metabolism (n=69), and weight change in previous year (≥ 10 kg, n=89). We also excluded pregnant women and those women who were unable to undergo BMD measurements. The final healthy reference population for the present analysis is 6 478. This large sample allowed us to estimate PBM as well as T- and Z-scores. The general characteristics of this population are depicted in table I.

BMD assessment

Bone density measurements were performed at the non-dominant proximal femur, the lumbar spine (L1-L4), and whole body using a DXA Lunar DPX NT instrument. The user manual instructions and International Society of Clinical Densitometry (ISCD) procedures were strictly followed.^{16,27} Standardized densitometry technicians performed all BMD measurements. Standard calibration of instruments was performed daily using the phantom provided by the manufacturer; technicians ensured that the daily variation coefficient (VC) was within normal operational standards and *in vivo* VC was lower than 1.5%. Results obtained by DXA are expressed as grams of hydroxyapatite per square centimeter (WHO Technical Report Series: Prevention and Management of Osteoporosis. http://whqlibdoc.who.int/trs/WHO_TRS_921.pdf).

T- and Z-scores estimates procedures

In order to compute T-scores by specific site (total body, femur and lumbar spine), we first estimated the reference value for PBM in our population following a previously reported procedure.²⁸ Briefly, we calculated the difference in g/cm² between the BMD of a subject and the PBM for the corresponding sex. The difference between these values is expressed as standard deviation (SD), or in other words, the difference between the studied subject and the PBM is standardized. The T-score obtained with this method represents the difference expressed by the number of standard deviations between the Young Normal (YN) value of the population of the same sex and the BMD of the subject studied. This sequence is summarized by the following formula:

Table I
POPULATION CHARACTERISTICS FOR A COHORT STUDY ON LIFESTYLE AND HEALTH. MEXICO

	Men= 1 849						Women= 4 629					
	7-18 years old n=483		19-50 years old n=1 004		51 and + n= 362		7-18 years old n= 568		19-50 years old n=3 100		51 and + n=961	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Age	13.03	3.10	36.50	8.84	60.99	8.24	13.44	3.12	36.28	8.78	60.87	8.21
Height	156.06	17.01	169.27	6.72	166.53	6.60	151.88	11.82	156.90	28.21	153.05	5.85
BMI	20.56	4.58	26.37	3.43	26.50	3.15	21.05	4.21	25.44	3.75	26.93	3.51
Abdominal circumference	76.07	13.28	91.11	9.03	94.47	8.57	77.00	11.71	85.64	10.00	94.68	10.99
% fat	24.18	10.97	28.41	6.71	29.87	6.32	35.23	9.01	41.11	6.48	43.94	5.76

$$T = \frac{(BMD - YN)}{SD}$$

Similarly the Z-value or Z-score represents the comparison between the subject's BMD and the mean BMD value of the healthy adult population of the same age and sex, referred to as Adult Mean Normal (AMN). It is also used as a measure of the standard deviation of the reference population. The formula is:

$$Z = \frac{(BMD - AMN)}{SD}$$

Results

We evaluated 6 478 healthy men and women from 7 to 80 years of age who did not have conditions affecting bone health, out of a total of 8 307 adults and 1 603 of their children formally enrolled in the first stage of an ongoing, long-term cohort study focusing on lifestyle and health. This recruitment strategy allowed us to have a cohort with healthy bones resembling the real ethnical mixture of a socioeconomic urban middle class population reflecting a wide sector of the Mexican population.

As shown in figure 1, BMD increases from infancy on and reaches PBM sometime between the late twenties and the mid thirties. Once PBM is reached, there is a progressive decrease in BMD with advancing age; these values curve as the population grows older and vary by sex and by skeletal region. Male BMD values are always greater than female BMD values. As shown in Figure 1, males reach the PBM subtotal of the skeleton and whole body BMD values (excluding the skull) between ages 22 and 25, while females do so at 27. Males reach PBM of the total femur measurement at age 23, while females reach it at age 27. Males and females both reach PBM of the lumbar spine at age 32.

Z-score values are depicted in figure 2. The curves for female BMD values are dramatically different than those for male values; male values are greater than female values starting in early childhood and continuing throughout life. It should also be noted that the values decrease less dramatically for males in later adulthood compared to females. Z-scores reflect a comparison of the individual patient compared to age- and sex-matched controls and can be used to evaluate follow-up studies in other clinical applications.

According to WHO recommendations, computation of the T-score is necessary to establish the cut-off

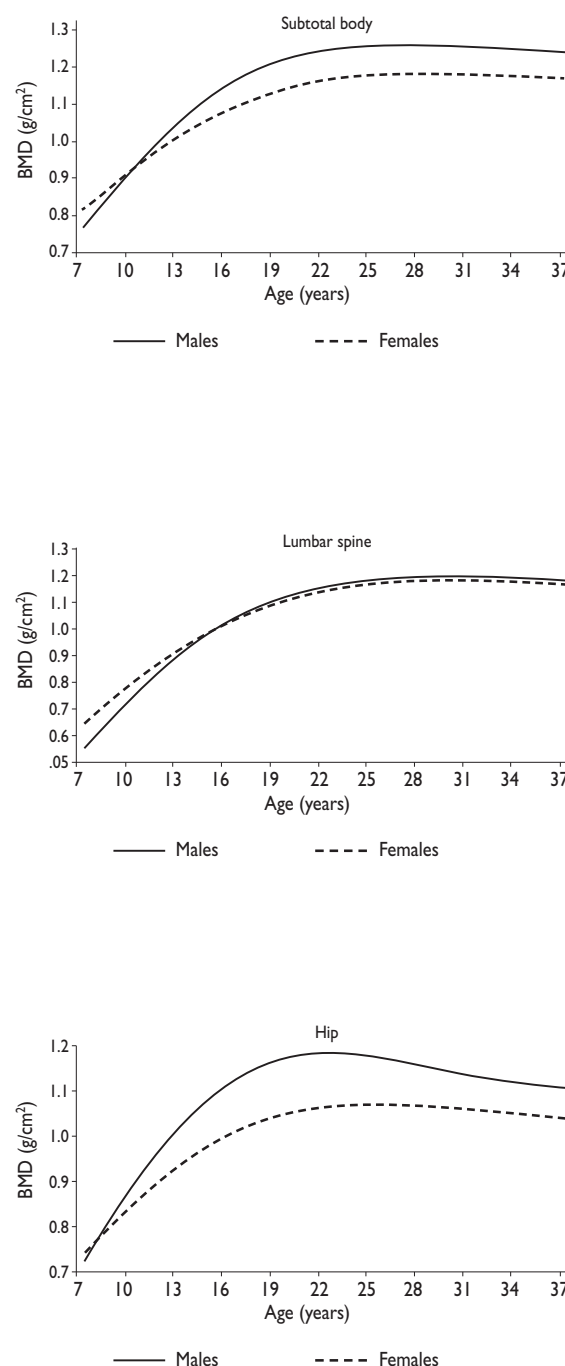


FIGURE 1. BONE MINERAL DENSITY DISTRIBUTION FOR THREE ANATOMICAL REGIONS IN MEXICAN MALES AND FEMALES FROM 6 TO 27 YEARS OLD

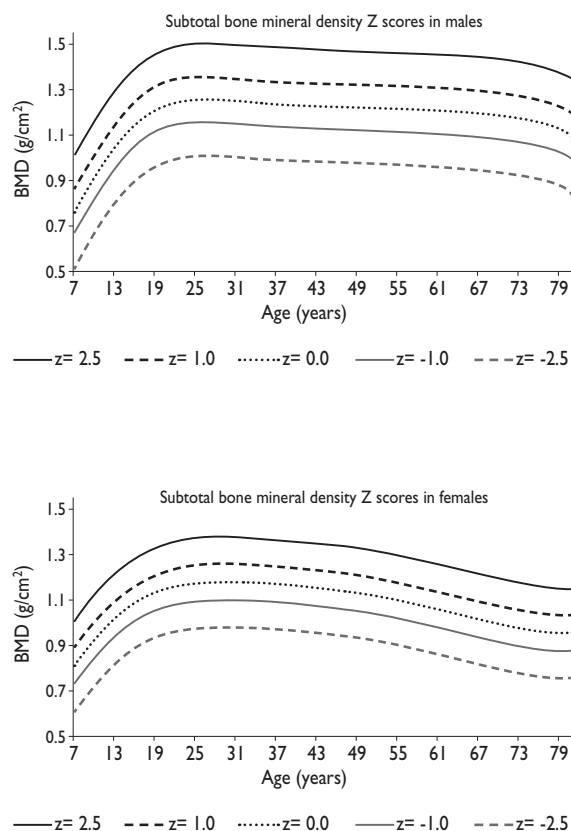


FIGURE 2. REFERENCE PARAMETERS FOR BONE MINERAL DENSITY AMONG A MEXICAN POPULATION CLASSIFIED BY AGE AND SEX

point for defining the presence of osteopenia and/or osteoporosis in each specific population. Therefore, both the method for computing T-scores and the reference population used for these computations must be optimized to generate accurate frequency estimates of these health problems. Currently, using instruments on one population that have been calibrated for another can thus impede accurate measurement. The DEXA instruments used in Mexico compute T-scores according to the BMD mean derived from a reference population of healthy US Hispanics between ages 20 and 40. In table II, we document the differences in the number of osteopenic and osteoporosis cases that occur when US Hispanics versus Mexicans are used as reference populations.

Our results indicate that, by using the normal reference T-scores obtained from the BMD values for the normal female population aged 20 to 40 in our cohort to classify the individual BMD values obtained from two large patient populations (the abnormal population in our cohort and the BMD data obtained and kindly provided to us by Deleze, Cons *et al.* [previously used for another publication²⁹]) that included 4 460 women aged 50 and older who were classified as normal, osteopenic or osteoporotic by 10 densitometry centers located across the country, a higher prevalence of osteopenia and osteoporosis is observed compared to the prevalence obtained using the reference population of healthy US Hispanics integrated in the densitometer by the manufacturer (see figure 3 and tables A.1-A.4 at the appendix). If we restrict the reference population to only those between the ages of 30 to 40 years, there is not a greater underestimation of cases of osteopenia and osteoporosis found using the manufacturer's database (figure 3). If the T-score is computed using the PBM value instead of mean BMD, which we consider to be a more realistic way to define the optimal bone quality reached at skeletal maturation,²¹ the degree of discrepancies between the manufacturer's and our estimates of osteopenia and osteoporosis are substantially similar using the T-scores obtained from either of our Mexican populations (women ages 20 to 40 or ages 30 to 40 years old) (figure 3).

It is clear that by using the manufacturer's T-score values to classify our abnormal Mexican population, we are underestimating the number of abnormal BMD cases. Using either our own T-scores calculated for populations aged 20 to 40 or 30 to 40, or our PBM, we found that 24.22% of the cohort population is osteopenic, whereas using the manufacturer's T-score for this value is only 16.52%. The results are similar for osteoporotic classification: using PBM we detect a prevalence of 9.73% versus 6.79% when using the manufacturer's values. Analyzing the data obtained from the Deleze, Cons cohort with the same criteria, it also became clear that there is a significant underestimation, restricted only to the femoral neck region (tables A.1-A.4 at the appendix).

Tables III.1-III.2 provide a comprehensive reference for the PBM-derived T-score values for a male and female Mexican population. These tables include reference values for both sexes for the 1) total skeleton (excluding the head from whole body scans), 2) the complete proximal femur, and 3) the lumbar region (L1-L4). Tables IV.1-IV.18 describe the Z-score for the same population, depicting each age and the corresponding BMD. These

Table II
CONCORDANCE OF OSTEOPENIA AND OSTEOPOROSIS PREVALENCE ACCORDING
TO DIFFERENT T SCORE COMPUTATIONS DERIVED FROM DIFFERENT REFERENCE POPULATIONS

		<i>Classified according to BMD mean of a 20-40 years old Mexican population</i>			
		<i>Normal %</i>	<i>Osteopenia %</i>	<i>Osteoporosis %</i>	<i>Total %</i>
Classified according to manufacturer's*	Normal (%)	68.57	8.13	0.00	76.70
	Osteopenia(%)	0.04	14.29	2.18	16.52
	Osteoporosis(%)	0.00	0.45	6.34	6.79
	Total (%)	68.61	22.87	8.52	100.00
		<i>Classified according to BMD mean of a 30-40 years old Mexican population</i>			
		<i>Normal %</i>	<i>Osteopenia %</i>	<i>Osteoporosis %</i>	<i>Normal %</i>
Classified according to manufacturer's*	Normal (%)	66.92	9.77	0.00	76.70
	Osteopenia(%)	0.03	13.67	2.82	16.52
	Osteoporosis(%)	0.00	0.48	6.31	6.79
	Total (%)	66.95	23.92	9.13	100.00
		<i>Classified according to Peak Bone Mass estimate in Mexican population</i>			
		<i>Normal %</i>	<i>Osteopenia %</i>	<i>Osteoporosis %</i>	<i>Normal %</i>
Classified according to manufacturer's*	Normal (%)	66.02	10.68	0.00	76.70
	Osteopenia(%)	0.03	13.37	3.12	16.52
	Osteoporosis(%)	0.00	0.17	6.61	6.79
	Total (%)	66.05	24.22	9.73	100.00

*T score from the total body BMD mean derived from a 20 – 40 year old, US Hispanic population

tables can be used manually to find the T-score and Z-score for the urban Mexican population.

Discussion

WHO guidelines are helpful for clinically adapting previous definitions of osteoporosis; practically speaking, these guidelines allow for greater accuracy when describing the extent and characteristics of osteoporosis. However, the expert panel that created these guidelines recognized that they would likely change as new knowledge was gathered.³⁰ Today, it has become quite evident that fracture risk is also affected by factors other than BMD; not all individuals with low BMD will fracture,

while some with normal BMD will.³¹ Also, WHO criteria define low BMD without regard to an individual's age, missing a key element of fracture risk. For example, though a 40 year-old and 65 year-old woman may have the same BMD levels, the older woman's probability of suffering a fracture is increased by the concurrent presence of other risk factors.³³⁻³⁵ In addition to excluding age from risk assessment, WHO criteria do not use PBM values as the optimal bone quality, using the less accurate mean BMD distribution for young adults (20 to 40 years old). The rationale behind the use of this age range is not clearly identified, nor is it clear how to form a reference group for populations that include different racial or ethnic groups.^{22-26, 32}

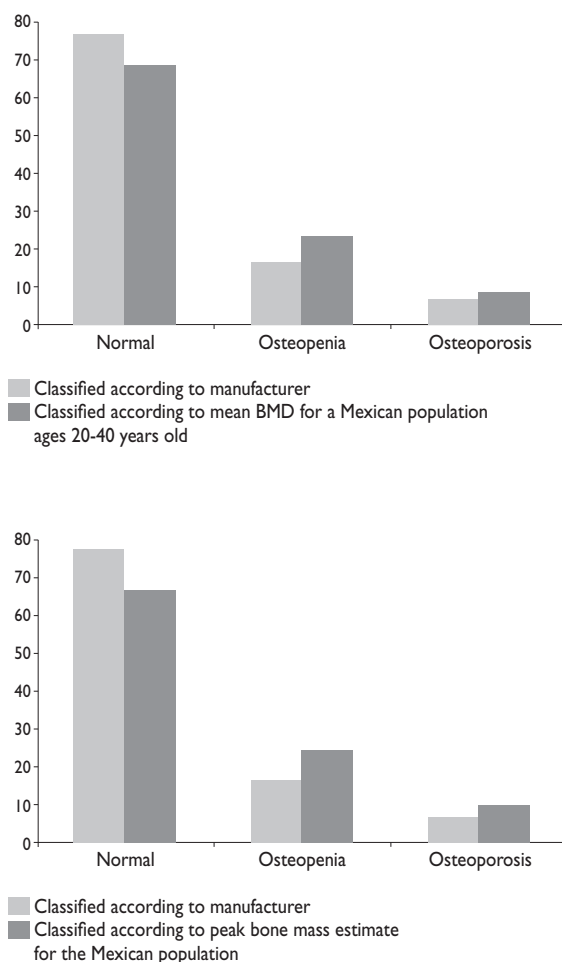


FIGURE 3. CONCORDANCE OF OSTEOPENIA AND OSTEOPOROSIS PREVALENCE ACCORDING TO DIFFERENT T-SCORE COMPUTATIONS DERIVED FROM DIFFERENT REFERENCE POPULATION

For Mexico, as well as for many other developing countries, the importance of having BMD T-score reference values that reflect the population's unique characteristics has become a critical issue.^{33,34} Several studies have shown that the reference data provided by manufacturers for a US Hispanic population may lead to dangerous underestimations of the population at risk.^{18,34-38} The reference databases provided by manufacturers do not reflect the complex heritage of the Mexican population, also called *mestizo*, which reflects both indigenous Mexican and Spanish ancestry.

To address a few of these emerging issues, we used the worker's cohort study data with the T-score reference values that reflect the population's unique characteristics to study bone density data from a large number of subjects of both sexes, age 7 to 80. This was done in order to determine whether there were differences in the number of people classified as having a higher than normal lifelong relative risk of having a fracture, in order to build a normal mestizo reference database that allowed us to define the age at which PBM is established at different skeletal sites. To the best of our knowledge, our study is the largest reported in Latin America, with a data set comprised of healthy, urban *mestizos* from early childhood to old age, which may represent more than 70% of the Mexican population. PBM and T-scores derived for this population differ significantly from values derived from commercial manufacturer's US Hispanic database, with our data reflecting significantly higher values and a curve indicating that age-dependent BMD loss is also very different. The T-score derived from our PBM values had only an 86% concordance with the manufacturers' Hispanic values that classify the normal population using PBM reference values, and up to 89% for T-score values for the population aged 20 to 40. Using our reference values, the number of people in the range of osteopenia and osteoporosis increased by 31 and 32 percent, respectively. As expected, this lack of concordance between the Mexican database and the manufacturers' Hispanic database increases as age increases. Revising estimates of fracture risk based on our numbers will have a major clinical impact since fracture prevention interventions will increase.²⁹

Since our Mexican database of reference values are not currently included in the software of commercial densitometers used in Mexico, interested users can classify their specific BMD values reported by these instruments according to the reference values presented in the BMD tables of this report (tables III.1-III.2, IV1-IV.18). Having normative BMD reference values for the urban Mexican population will be very relevant for our densitometry community. This more accurate normative reference data may give us the opportunity to improve the decision making process used in the prevention and care of bone density-related public health problems, though we must ensure that it does not simply amount to an increased burden on an already strained healthcare system. These considerations should be taken into account by policy makers in order to improve the Mexican healthcare infrastructure as well as to seek new ways to address the growing populations' healthcare needs.

Table III.1
BONE MINERAL DENSITY T SCORE FOR MALE POPULATION

T SCORE	BONE MINERAL DENSITY (g/cm ²)								
	Subtotal body	Lumbar t=region	Hip	Head	Arm	Proximal femur	Trunk	Ribs	Pelvis
-5.0	0.762	0.490	0.480	0.913	0.402	0.785	0.567	0.424	0.601
-4.5	0.811	0.559	0.551	1.042	0.461	0.845	0.614	0.461	0.668
-4.0	0.861	0.629	0.621	1.171	0.520	0.906	0.662	0.498	0.735
-3.5	0.910	0.699	0.692	1.299	0.579	0.967	0.709	0.535	0.802
-3.0	0.960	0.768	0.762	1.428	0.638	1.028	0.757	0.573	0.870
-2.5	1.009	0.838	0.832	1.557	0.697	1.088	0.804	0.610	0.937
-2.0	1.059	0.907	0.903	1.686	0.756	1.149	0.852	0.647	1.004
-1.5	1.108	0.977	0.973	1.815	0.815	1.210	0.899	0.684	1.071
-1.0	1.158	1.047	1.044	1.944	0.874	1.270	0.946	0.722	1.138
-0.5	1.208	1.116	1.114	2.073	0.934	1.331	0.994	0.759	1.206
0.0	1.257	1.186	1.185	2.202	0.993	1.392	1.041	0.796	1.273
0.5	1.307	1.255	1.255	2.331	1.052	1.452	1.089	0.833	1.340
1.0	1.356	1.325	1.326	2.460	1.111	1.513	1.136	0.871	1.407
1.5	1.406	1.395	1.396	2.589	1.170	1.574	1.184	0.908	1.475
2.0	1.455	1.464	1.466	2.718	1.229	1.634	1.231	0.945	1.542
2.5	1.505	1.534	1.537	2.847	1.288	1.695	1.279	0.982	1.609
3.0	1.554	1.603	1.607	2.976	1.347	1.756	1.326	1.020	1.676
3.5	1.604	1.673	1.678	3.105	1.407	1.816	1.374	1.057	1.743
4.0	1.653	1.743	1.748	3.234	1.466	1.877	1.421	1.094	1.811
4.5	1.703	1.812	1.819	3.362	1.525	1.938	1.469	1.131	1.878
5.0	1.752	1.882	1.889	3.491	1.584	1.999	1.516	1.168	1.945

Table III.2
BONE MINERAL DENSITY T SCORE FOR FEMALE POPULATION

T SCORE	Bone mineral density (g/cm ²)								
	Subtotal body	Lumbar region	Hip	Head	Arm	Proximal femur	Trunk	Ribs	Pelvis
-5.0	0.783	0.509	0.471	1.088	0.415	0.757	0.586	0.440	0.628
-4.5	0.823	0.576	0.531	1.225	0.460	0.800	0.625	0.470	0.681
-4.0	0.863	0.644	0.591	1.362	0.504	0.844	0.665	0.501	0.735
-3.5	0.902	0.711	0.651	1.499	0.548	0.887	0.705	0.531	0.788
-3.0	0.942	0.778	0.711	1.636	0.592	0.931	0.745	0.562	0.841
-2.5	0.982	0.845	0.770	1.773	0.636	0.974	0.784	0.593	0.895
-2.0	1.021	0.913	0.830	1.910	0.681	1.018	0.824	0.623	0.948
-1.5	1.061	0.980	0.890	2.047	0.725	1.061	0.864	0.654	1.002
-1.0	1.100	1.047	0.950	2.185	0.769	1.105	0.904	0.685	1.055
-0.5	1.140	1.115	1.010	2.322	0.813	1.148	0.943	0.715	1.108
0.0	1.180	1.182	1.070	2.459	0.857	1.192	0.983	0.746	1.162
0.5	1.219	1.249	1.130	2.596	0.901	1.235	1.023	0.777	1.215
1.0	1.259	1.317	1.189	2.733	0.946	1.279	1.063	0.807	1.268
1.5	1.299	1.384	1.249	2.870	0.990	1.323	1.102	0.838	1.322
2.0	1.338	1.451	1.309	3.007	1.034	1.366	1.142	0.869	1.375
2.5	1.378	1.519	1.369	3.144	1.078	1.410	1.182	0.899	1.429
3.0	1.417	1.586	1.429	3.282	1.122	1.453	1.222	0.930	1.482
3.5	1.457	1.653	1.489	3.419	1.167	1.497	1.261	0.961	1.535
4.0	1.497	1.720	1.548	3.556	1.211	1.540	1.301	0.991	1.589
4.5	1.536	1.788	1.608	3.693	1.255	1.584	1.341	1.022	1.642
5.0	1.576	1.855	1.668	3.830	1.299	1.627	1.380	1.052	1.695

Table IV.I
BONE MINERAL DENSITY Z SCORE VALUES OF SUBTOTAL BODY FOR MALE POPULATION

Age	Z SCORE					Age	Z SCORE				
	-2.5	-1.0	0.0	1.0	2.5		-2.5	-1.0	0.0	1.0	2.5
7	0.524	0.673	0.772	0.871	1.019	45	0.979	1.127	1.227	1.326	1.474
8	0.581	0.729	0.828	0.927	1.076	46	0.977	1.126	1.225	1.324	1.473
9	0.633	0.782	0.881	0.980	1.129	47	0.976	1.125	1.224	1.323	1.471
10	0.683	0.831	0.930	1.030	1.178	48	0.975	1.123	1.222	1.321	1.470
11	0.729	0.877	0.976	1.075	1.224	49	0.973	1.122	1.221	1.320	1.469
12	0.771	0.919	1.019	1.118	1.266	50	0.972	1.121	1.220	1.319	1.467
13	0.810	0.958	1.057	1.156	1.305	51	0.971	1.119	1.218	1.317	1.466
14	0.845	0.993	1.092	1.191	1.340	52	0.969	1.118	1.217	1.316	1.465
15	0.876	1.025	1.124	1.223	1.372	53	0.968	1.116	1.215	1.315	1.463
16	0.904	1.053	1.152	1.251	1.400	54	0.966	1.115	1.214	1.313	1.462
17	0.929	1.077	1.176	1.275	1.424	55	0.965	1.114	1.213	1.312	1.460
18	0.950	1.098	1.197	1.296	1.445	56	0.964	1.112	1.211	1.310	1.459
19	0.967	1.116	1.215	1.314	1.462	57	0.962	1.111	1.210	1.309	1.458
20	0.981	1.129	1.228	1.328	1.476	58	0.961	1.109	1.208	1.308	1.456
21	0.991	1.140	1.239	1.338	1.487	59	0.959	1.108	1.207	1.306	1.455
22	0.999	1.148	1.247	1.346	1.495	60	0.958	1.107	1.206	1.305	1.453
23	1.005	1.153	1.252	1.351	1.500	61	0.956	1.105	1.204	1.303	1.452
24	1.008	1.156	1.255	1.355	1.503	62	0.955	1.104	1.203	1.302	1.450
25	1.009	1.158	1.257	1.356	1.505	63	0.953	1.102	1.201	1.300	1.449
26	1.009	1.158	1.257	1.356	1.505	64	0.952	1.100	1.199	1.299	1.447
27	1.008	1.157	1.256	1.355	1.504	65	0.950	1.099	1.198	1.297	1.445
28	1.007	1.155	1.254	1.354	1.502	66	0.948	1.097	1.196	1.295	1.444
29	1.005	1.153	1.253	1.352	1.500	67	0.946	1.095	1.194	1.293	1.442
30	1.003	1.152	1.251	1.350	1.498	68	0.944	1.093	1.192	1.291	1.439
31	1.001	1.150	1.249	1.348	1.496	69	0.941	1.090	1.189	1.288	1.437
32	0.999	1.148	1.247	1.346	1.495	70	0.938	1.087	1.186	1.285	1.433
33	0.997	1.146	1.245	1.344	1.493	71	0.934	1.083	1.182	1.281	1.430
34	0.996	1.144	1.243	1.342	1.491	72	0.930	1.078	1.177	1.276	1.425
35	0.994	1.143	1.242	1.341	1.489	73	0.924	1.073	1.172	1.271	1.419
36	0.992	1.141	1.240	1.339	1.488	74	0.918	1.066	1.165	1.264	1.413
37	0.991	1.139	1.238	1.338	1.486	75	0.910	1.059	1.158	1.257	1.406
38	0.989	1.138	1.237	1.336	1.485	76	0.902	1.050	1.149	1.249	1.397
39	0.988	1.136	1.235	1.334	1.483	77	0.892	1.041	1.140	1.239	1.387
40	0.986	1.135	1.234	1.333	1.481	78	0.881	1.030	1.129	1.228	1.376
41	0.985	1.133	1.232	1.331	1.480	79	0.869	1.017	1.116	1.215	1.364
42	0.983	1.132	1.231	1.330	1.478	80	0.855	1.003	1.102	1.201	1.350
43	0.982	1.130	1.229	1.328	1.477						
44	0.980	1.129	1.228	1.327	1.476						

Table IV.2
BONE MINERAL DENSITY Z SCORE VALUES OF LUMBAR REGION FOR MALE POPULATION

Age	Z SCORE					Age	Z SCORE				
	-2.5	-1.0	0.0	1.0	2.5		-2.5	-1.0	0.0	1.0	2.5
7	0.199	0.421	0.561	0.700	0.909	45	0.808	1.031	1.170	1.309	1.518
8	0.267	0.489	0.629	0.768	0.977	46	0.807	1.029	1.169	1.308	1.517
9	0.331	0.553	0.693	0.832	1.041	47	0.805	1.028	1.167	1.306	1.515
10	0.391	0.613	0.753	0.892	1.101	48	0.803	1.026	1.165	1.305	1.513
11	0.447	0.669	0.808	0.948	1.156	49	0.802	1.025	1.164	1.303	1.512
12	0.498	0.721	0.860	0.999	1.208	50	0.800	1.023	1.162	1.302	1.510
13	0.546	0.769	0.908	1.047	1.256	51	0.799	1.022	1.161	1.300	1.509
14	0.590	0.813	0.952	1.091	1.300	52	0.798	1.020	1.160	1.299	1.508
15	0.630	0.852	0.991	1.131	1.339	53	0.796	1.019	1.158	1.298	1.506
16	0.665	0.888	1.027	1.166	1.375	54	0.795	1.018	1.157	1.296	1.505
17	0.697	0.919	1.059	1.198	1.407	55	0.794	1.017	1.156	1.295	1.504
18	0.724	0.947	1.086	1.225	1.434	56	0.793	1.016	1.155	1.294	1.503
19	0.748	0.970	1.110	1.249	1.458	57	0.792	1.015	1.154	1.294	1.502
20	0.767	0.990	1.129	1.268	1.477	58	0.792	1.015	1.154	1.293	1.502
21	0.783	1.006	1.145	1.284	1.493	59	0.791	1.014	1.153	1.292	1.501
22	0.796	1.018	1.158	1.297	1.506	60	0.791	1.014	1.153	1.292	1.501
23	0.805	1.028	1.167	1.306	1.515	61	0.791	1.014	1.153	1.292	1.501
24	0.812	1.035	1.174	1.314	1.522	62	0.791	1.014	1.153	1.292	1.501
25	0.817	1.040	1.179	1.319	1.527	63	0.791	1.014	1.153	1.292	1.501
26	0.821	1.043	1.183	1.322	1.531	64	0.792	1.014	1.154	1.293	1.502
27	0.823	1.045	1.185	1.324	1.533	65	0.792	1.015	1.154	1.293	1.502
28	0.824	1.046	1.185	1.325	1.533	66	0.793	1.016	1.155	1.294	1.503
29	0.824	1.047	1.186	1.325	1.534	67	0.793	1.016	1.155	1.294	1.503
30	0.824	1.047	1.186	1.325	1.534	68	0.793	1.016	1.155	1.294	1.503
31	0.824	1.046	1.186	1.325	1.534	69	0.792	1.015	1.154	1.294	1.502
32	0.823	1.046	1.185	1.325	1.533	70	0.790	1.013	1.152	1.292	1.500
33	0.823	1.046	1.185	1.324	1.533	71	0.787	1.010	1.149	1.288	1.497
34	0.822	1.045	1.184	1.323	1.532	72	0.783	1.005	1.145	1.284	1.493
35	0.821	1.044	1.183	1.323	1.531	73	0.776	0.999	1.138	1.277	1.486
36	0.821	1.043	1.182	1.322	1.530	74	0.768	0.991	1.130	1.269	1.478
37	0.819	1.042	1.181	1.321	1.529	75	0.757	0.980	1.119	1.258	1.467
38	0.818	1.041	1.180	1.319	1.528	76	0.744	0.967	1.106	1.245	1.454
39	0.817	1.040	1.179	1.318	1.527	77	0.728	0.951	1.090	1.229	1.438
40	0.816	1.038	1.178	1.317	1.526	78	0.709	0.932	1.071	1.210	1.419
41	0.814	1.037	1.176	1.315	1.524	79	0.687	0.909	1.049	1.188	1.397
42	0.813	1.036	1.175	1.314	1.523	80	0.661	0.884	1.023	1.162	1.371
43	0.811	1.034	1.173	1.312	1.521						
44	0.810	1.032	1.172	1.311	1.520						

Table IV.3
BONE MINERAL DENSITY Z SCORE VALUES OF HIP FOR MALE POPULATION

Age	Z SCORE					Age	Z SCORE				
	-2.5	-1.0	0.0	1.0	2.5		-2.5	-1.0	0.0	1.0	2.5
7	0.374	0.585	0.726	0.867	1.078	45	0.733	0.944	1.085	1.226	1.437
8	0.434	0.645	0.786	0.927	1.138	46	0.731	0.943	1.084	1.225	1.436
9	0.490	0.701	0.842	0.983	1.195	47	0.730	0.941	1.082	1.223	1.435
10	0.542	0.753	0.894	1.035	1.246	48	0.729	0.940	1.081	1.222	1.433
11	0.589	0.801	0.942	1.083	1.294	49	0.728	0.939	1.080	1.221	1.432
12	0.633	0.844	0.985	1.126	1.337	50	0.726	0.938	1.079	1.219	1.431
13	0.672	0.883	1.024	1.165	1.376	51	0.725	0.937	1.077	1.218	1.430
14	0.706	0.918	1.059	1.199	1.411	52	0.724	0.935	1.076	1.217	1.428
15	0.737	0.948	1.089	1.230	1.441	53	0.723	0.934	1.075	1.216	1.427
16	0.763	0.974	1.115	1.256	1.467	54	0.721	0.933	1.074	1.215	1.426
17	0.785	0.996	1.137	1.278	1.489	55	0.720	0.931	1.072	1.213	1.425
18	0.802	1.014	1.155	1.296	1.507	56	0.719	0.930	1.071	1.212	1.423
19	0.816	1.027	1.168	1.309	1.520	57	0.717	0.928	1.069	1.210	1.421
20	0.825	1.036	1.177	1.318	1.529	58	0.715	0.927	1.067	1.208	1.420
21	0.830	1.042	1.183	1.323	1.535	59	0.713	0.925	1.065	1.206	1.418
22	0.832	1.044	1.185	1.326	1.537	60	0.711	0.922	1.063	1.204	1.415
23	0.832	1.043	1.184	1.325	1.536	61	0.708	0.920	1.061	1.202	1.413
24	0.829	1.040	1.181	1.322	1.533	62	0.706	0.917	1.058	1.199	1.410
25	0.824	1.035	1.176	1.317	1.528	63	0.703	0.914	1.055	1.196	1.407
26	0.817	1.029	1.170	1.310	1.522	64	0.699	0.911	1.051	1.192	1.404
27	0.810	1.021	1.162	1.303	1.515	65	0.695	0.907	1.048	1.189	1.400
28	0.803	1.014	1.155	1.296	1.507	66	0.691	0.903	1.044	1.184	1.396
29	0.795	1.006	1.147	1.288	1.499	67	0.687	0.898	1.039	1.180	1.391
30	0.788	0.999	1.140	1.281	1.492	68	0.681	0.893	1.034	1.175	1.386
31	0.781	0.993	1.134	1.275	1.486	69	0.676	0.887	1.028	1.169	1.380
32	0.776	0.987	1.128	1.269	1.480	70	0.669	0.880	1.021	1.162	1.374
33	0.770	0.981	1.122	1.263	1.475	71	0.662	0.873	1.014	1.155	1.366
34	0.765	0.976	1.117	1.258	1.470	72	0.654	0.865	1.006	1.147	1.358
35	0.760	0.972	1.113	1.254	1.465	73	0.645	0.856	0.997	1.138	1.349
36	0.756	0.968	1.109	1.249	1.461	74	0.635	0.846	0.987	1.128	1.339
37	0.753	0.964	1.105	1.246	1.457	75	0.624	0.835	0.976	1.117	1.328
38	0.749	0.960	1.101	1.242	1.454	76	0.612	0.823	0.964	1.105	1.316
39	0.746	0.957	1.098	1.239	1.451	77	0.599	0.810	0.951	1.092	1.303
40	0.743	0.955	1.095	1.236	1.448	78	0.584	0.796	0.936	1.077	1.289
41	0.741	0.952	1.093	1.234	1.445	79	0.568	0.780	0.921	1.062	1.273
42	0.738	0.950	1.091	1.232	1.443	80	0.551	0.763	0.904	1.045	1.256
43	0.736	0.948	1.089	1.230	1.441						
44	0.735	0.946	1.087	1.228	1.439						

Table IV.4
BONE MINERAL DENSITY Z SCORE VALUES OF HEAD FOR MALE POPULATION

Age	Z SCORE					Age	Z SCORE				
	-2.5	-1.0	0.0	1.0	2.5		-2.5	-1.0	0.0	1.0	2.5
7	0.696	1.083	1.341	1.599	1.986	45	1.534	1.921	2.179	2.437	2.824
8	0.780	1.167	1.425	1.683	2.070	46	1.531	1.918	2.176	2.434	2.820
9	0.860	1.246	1.504	1.762	2.149	47	1.528	1.915	2.173	2.431	2.818
10	0.934	1.321	1.579	1.837	2.224	48	1.525	1.912	2.170	2.428	2.815
11	1.005	1.392	1.649	1.907	2.294	49	1.523	1.910	2.167	2.425	2.812
12	1.070	1.457	1.715	1.973	2.360	50	1.520	1.907	2.165	2.423	2.810
13	1.131	1.518	1.776	2.034	2.421	51	1.518	1.905	2.163	2.421	2.808
14	1.188	1.575	1.833	2.091	2.477	52	1.517	1.904	2.162	2.419	2.806
15	1.240	1.627	1.885	2.143	2.529	53	1.516	1.903	2.160	2.418	2.805
16	1.287	1.674	1.932	2.190	2.577	54	1.515	1.902	2.160	2.418	2.804
17	1.330	1.717	1.975	2.233	2.619	55	1.515	1.902	2.160	2.418	2.804
18	1.368	1.755	2.013	2.271	2.658	56	1.516	1.902	2.160	2.418	2.805
19	1.402	1.789	2.047	2.305	2.691	57	1.517	1.904	2.162	2.419	2.806
20	1.431	1.818	2.076	2.334	2.721	58	1.519	1.906	2.164	2.421	2.808
21	1.456	1.843	2.101	2.359	2.745	59	1.522	1.909	2.166	2.424	2.811
22	1.477	1.864	2.122	2.380	2.767	60	1.525	1.912	2.170	2.428	2.815
23	1.495	1.882	2.139	2.397	2.784	61	1.530	1.917	2.175	2.433	2.819
24	1.509	1.896	2.154	2.412	2.799	62	1.536	1.923	2.180	2.438	2.825
25	1.521	1.908	2.166	2.424	2.810	63	1.542	1.929	2.187	2.445	2.832
26	1.530	1.917	2.175	2.433	2.820	64	1.550	1.937	2.195	2.453	2.840
27	1.538	1.925	2.182	2.440	2.827	65	1.559	1.946	2.204	2.462	2.848
28	1.544	1.930	2.188	2.446	2.833	66	1.568	1.955	2.213	2.471	2.858
29	1.548	1.935	2.193	2.451	2.837	67	1.577	1.964	2.222	2.480	2.867
30	1.551	1.938	2.196	2.454	2.841	68	1.585	1.972	2.230	2.488	2.875
31	1.554	1.941	2.199	2.457	2.843	69	1.591	1.978	2.236	2.494	2.881
32	1.556	1.943	2.201	2.458	2.845	70	1.595	1.982	2.240	2.498	2.884
33	1.557	1.944	2.202	2.459	2.846	71	1.595	1.982	2.240	2.498	2.885
34	1.557	1.944	2.202	2.460	2.847	72	1.592	1.979	2.236	2.494	2.881
35	1.557	1.944	2.202	2.460	2.846	73	1.583	1.970	2.228	2.486	2.873
36	1.556	1.943	2.201	2.459	2.846	74	1.570	1.957	2.214	2.472	2.859
37	1.555	1.942	2.200	2.458	2.844	75	1.550	1.937	2.194	2.452	2.839
38	1.553	1.940	2.198	2.456	2.843	76	1.523	1.910	2.168	2.425	2.812
39	1.551	1.938	2.196	2.454	2.841	77	1.488	1.875	2.133	2.391	2.778
40	1.549	1.936	2.194	2.451	2.838	78	1.445	1.832	2.090	2.348	2.735
41	1.546	1.933	2.191	2.449	2.836	79	1.393	1.780	2.038	2.296	2.683
42	1.543	1.930	2.188	2.446	2.833	80	1.331	1.718	1.976	2.234	2.621
43	1.540	1.927	2.185	2.443	2.830						
44	1.537	1.924	2.182	2.440	2.827						

Table IV.5
BONE MINERAL DENSITY Z SCORE VALUES OF ARM FOR MALE POPULATION

Age	Z SCORE					Age	Z SCORE				
	-2.5	-1.0	0.0	1.0	2.5		-2.5	-1.0	0.0	1.0	2.5
7	0.218	0.396	0.514	0.632	0.809	45	0.688	0.866	0.984	1.102	1.280
8	0.270	0.448	0.566	0.684	0.862	46	0.687	0.864	0.982	1.101	1.278
9	0.319	0.497	0.615	0.733	0.911	47	0.685	0.863	0.981	1.099	1.276
10	0.365	0.543	0.661	0.779	0.957	48	0.683	0.861	0.979	1.097	1.275
11	0.408	0.586	0.704	0.822	0.999	49	0.681	0.859	0.977	1.095	1.273
12	0.448	0.625	0.744	0.862	1.039	50	0.679	0.857	0.975	1.093	1.271
13	0.485	0.662	0.780	0.898	1.076	51	0.677	0.855	0.973	1.091	1.268
14	0.518	0.695	0.814	0.932	1.109	52	0.675	0.852	0.970	1.089	1.266
15	0.548	0.726	0.844	0.962	1.140	53	0.672	0.850	0.968	1.086	1.263
16	0.576	0.753	0.871	0.990	1.167	54	0.670	0.847	0.965	1.083	1.261
17	0.600	0.777	0.895	1.014	1.191	55	0.667	0.844	0.962	1.081	1.258
18	0.621	0.798	0.916	1.035	1.212	56	0.664	0.841	0.959	1.078	1.255
19	0.639	0.816	0.934	1.053	1.230	57	0.661	0.838	0.956	1.074	1.252
20	0.654	0.831	0.949	1.067	1.245	58	0.657	0.835	0.953	1.071	1.248
21	0.666	0.843	0.961	1.079	1.257	59	0.654	0.831	0.949	1.068	1.245
22	0.675	0.852	0.971	1.089	1.266	60	0.650	0.827	0.946	1.064	1.241
23	0.682	0.860	0.978	1.096	1.274	61	0.646	0.824	0.942	1.060	1.237
24	0.688	0.865	0.983	1.102	1.279	62	0.642	0.820	0.938	1.056	1.233
25	0.691	0.869	0.987	1.105	1.283	63	0.638	0.815	0.934	1.052	1.229
26	0.694	0.871	0.990	1.108	1.285	64	0.634	0.811	0.929	1.048	1.225
27	0.695	0.873	0.991	1.109	1.287	65	0.629	0.807	0.925	1.043	1.220
28	0.696	0.874	0.992	1.110	1.287	66	0.625	0.802	0.920	1.038	1.216
29	0.697	0.874	0.992	1.110	1.288	67	0.620	0.797	0.916	1.034	1.211
30	0.697	0.874	0.992	1.111	1.288	68	0.615	0.793	0.911	1.029	1.207
31	0.697	0.874	0.993	1.111	1.288	69	0.611	0.788	0.907	1.025	1.202
32	0.697	0.874	0.993	1.111	1.288	70	0.607	0.784	0.902	1.021	1.198
33	0.697	0.874	0.993	1.111	1.288	71	0.603	0.781	0.899	1.017	1.194
34	0.697	0.874	0.993	1.111	1.288	72	0.600	0.777	0.895	1.014	1.191
35	0.697	0.874	0.992	1.111	1.288	73	0.597	0.775	0.893	1.011	1.188
36	0.696	0.874	0.992	1.110	1.288	74	0.595	0.772	0.891	1.009	1.186
37	0.696	0.873	0.992	1.110	1.287	75	0.594	0.771	0.889	1.008	1.185
38	0.695	0.873	0.991	1.109	1.287	76	0.591	0.769	0.887	1.005	1.183
39	0.695	0.872	0.990	1.109	1.286	77	0.589	0.767	0.885	1.003	1.181
40	0.694	0.871	0.990	1.108	1.285	78	0.587	0.765	0.883	1.001	1.179
41	0.693	0.871	0.989	1.107	1.284	79	0.585	0.763	0.881	0.999	1.177
42	0.692	0.870	0.988	1.106	1.283	80	0.583	0.761	0.879	0.997	1.175
43	0.691	0.868	0.987	1.105	1.282						
44	0.690	0.867	0.985	1.104	1.281						

Table IV.6
BONE MINERAL DENSITY Z SCORE VALUES OF PROXIMAL FEMUR FOR MALE POPULATION

Age	Z SCORE					Age	Z SCORE				
	-2.5	-1.0	0.0	1.0	2.5		-2.5	-1.0	0.0	1.0	2.5
7	0.408	0.590	0.711	0.832	1.014	45	1.005	1.187	1.308	1.429	1.611
8	0.493	0.675	0.797	0.918	1.100	46	1.004	1.186	1.307	1.429	1.611
9	0.573	0.755	0.876	0.998	1.180	47	1.003	1.185	1.306	1.428	1.610
10	0.647	0.829	0.950	1.072	1.254	48	1.002	1.184	1.306	1.427	1.609
11	0.715	0.897	1.019	1.140	1.322	49	1.001	1.184	1.305	1.426	1.608
12	0.777	0.960	1.081	1.202	1.384	50	1.001	1.183	1.304	1.426	1.608
13	0.834	1.016	1.137	1.259	1.441	51	1.000	1.182	1.304	1.425	1.607
14	0.885	1.067	1.188	1.310	1.492	52	0.999	1.182	1.303	1.424	1.606
15	0.930	1.112	1.233	1.355	1.537	53	0.999	1.181	1.302	1.424	1.606
16	0.969	1.151	1.273	1.394	1.576	54	0.998	1.180	1.301	1.423	1.605
17	1.002	1.185	1.306	1.427	1.609	55	0.997	1.179	1.300	1.422	1.604
18	1.030	1.212	1.334	1.455	1.637	56	0.996	1.178	1.299	1.421	1.603
19	1.052	1.234	1.355	1.477	1.659	57	0.994	1.177	1.298	1.419	1.601
20	1.068	1.250	1.372	1.493	1.675	58	0.993	1.175	1.296	1.418	1.600
21	1.079	1.261	1.383	1.504	1.686	59	0.991	1.173	1.295	1.416	1.598
22	1.086	1.268	1.389	1.510	1.692	60	0.989	1.171	1.293	1.414	1.596
23	1.088	1.270	1.392	1.513	1.695	61	0.987	1.169	1.290	1.412	1.594
24	1.088	1.270	1.391	1.512	1.694	62	0.984	1.166	1.288	1.409	1.591
25	1.084	1.266	1.388	1.509	1.691	63	0.981	1.163	1.285	1.406	1.588
26	1.079	1.261	1.383	1.504	1.686	64	0.978	1.160	1.281	1.403	1.585
27	1.073	1.255	1.376	1.498	1.680	65	0.974	1.156	1.278	1.399	1.581
28	1.066	1.248	1.369	1.490	1.672	66	0.970	1.152	1.273	1.395	1.577
29	1.058	1.240	1.362	1.483	1.665	67	0.965	1.148	1.269	1.390	1.572
30	1.052	1.234	1.355	1.477	1.659	68	0.961	1.143	1.264	1.385	1.567
31	1.046	1.228	1.349	1.470	1.653	69	0.955	1.138	1.259	1.380	1.562
32	1.040	1.222	1.344	1.465	1.647	70	0.950	1.132	1.253	1.375	1.557
33	1.035	1.217	1.339	1.460	1.642	71	0.944	1.126	1.248	1.369	1.551
34	1.031	1.213	1.334	1.455	1.637	72	0.938	1.120	1.242	1.363	1.545
35	1.026	1.209	1.330	1.451	1.633	73	0.932	1.114	1.236	1.357	1.539
36	1.023	1.205	1.326	1.448	1.630	74	0.926	1.108	1.229	1.351	1.533
37	1.020	1.202	1.323	1.444	1.626	75	0.919	1.102	1.223	1.344	1.526
38	1.017	1.199	1.320	1.441	1.624	76	0.913	1.095	1.216	1.338	1.520
39	1.014	1.196	1.318	1.439	1.621	77	0.906	1.088	1.210	1.331	1.513
40	1.012	1.194	1.315	1.437	1.619	78	0.899	1.082	1.203	1.324	1.506
41	1.010	1.192	1.313	1.435	1.617	79	0.893	1.075	1.196	1.318	1.500
42	1.008	1.190	1.312	1.433	1.615	80	0.886	1.068	1.189	1.311	1.493
43	1.007	1.189	1.310	1.432	1.614						
44	1.006	1.188	1.309	1.430	1.613						

Table IV.7
BONE MINERAL DENSITY Z SCORE VALUES OF TRUNK FOR MALE POPULATION

Age	Z SCORE					Age	Z SCORE				
	-2.5	-1.0	0.0	1.0	2.5		-2.5	-1.0	0.0	1.0	2.5
7	0.341	0.483	0.578	0.673	0.816	45	0.776	0.919	1.014	1.109	1.251
8	0.396	0.538	0.633	0.728	0.870	46	0.775	0.918	1.013	1.108	1.250
9	0.447	0.589	0.684	0.779	0.922	47	0.775	0.917	1.012	1.107	1.250
10	0.494	0.637	0.732	0.827	0.969	48	0.774	0.916	1.011	1.106	1.249
11	0.538	0.681	0.776	0.871	1.013	49	0.773	0.916	1.011	1.106	1.248
12	0.579	0.722	0.817	0.911	1.054	50	0.772	0.915	1.010	1.105	1.247
13	0.616	0.759	0.854	0.949	1.091	51	0.772	0.914	1.009	1.104	1.247
14	0.650	0.792	0.887	0.982	1.125	52	0.771	0.913	1.008	1.103	1.246
15	0.680	0.823	0.918	1.013	1.155	53	0.770	0.913	1.008	1.102	1.245
16	0.707	0.849	0.944	1.039	1.182	54	0.769	0.912	1.007	1.102	1.244
17	0.730	0.873	0.968	1.063	1.205	55	0.768	0.911	1.006	1.101	1.243
18	0.750	0.892	0.987	1.082	1.225	56	0.768	0.910	1.005	1.100	1.243
19	0.766	0.909	1.004	1.099	1.241	57	0.767	0.909	1.004	1.099	1.242
20	0.779	0.922	1.017	1.112	1.254	58	0.766	0.908	1.003	1.098	1.241
21	0.789	0.931	1.026	1.121	1.264	59	0.765	0.907	1.002	1.097	1.240
22	0.796	0.938	1.033	1.128	1.271	60	0.764	0.906	1.001	1.096	1.239
23	0.801	0.943	1.038	1.133	1.275	61	0.763	0.905	1.000	1.095	1.238
24	0.803	0.946	1.041	1.136	1.278	62	0.762	0.904	0.999	1.094	1.236
25	0.804	0.946	1.041	1.136	1.279	63	0.760	0.903	0.998	1.093	1.235
26	0.804	0.946	1.041	1.136	1.279	64	0.759	0.901	0.996	1.091	1.234
27	0.802	0.945	1.040	1.135	1.277	65	0.758	0.900	0.995	1.090	1.232
28	0.800	0.943	1.038	1.133	1.275	66	0.756	0.898	0.993	1.088	1.231
29	0.798	0.941	1.036	1.131	1.273	67	0.754	0.897	0.991	1.086	1.229
30	0.796	0.939	1.034	1.129	1.271	68	0.752	0.894	0.989	1.084	1.227
31	0.794	0.937	1.032	1.127	1.269	69	0.749	0.891	0.986	1.081	1.224
32	0.792	0.935	1.030	1.125	1.267	70	0.746	0.888	0.983	1.078	1.220
33	0.791	0.933	1.028	1.123	1.265	71	0.741	0.884	0.979	1.074	1.216
34	0.789	0.931	1.026	1.121	1.264	72	0.736	0.879	0.974	1.069	1.211
35	0.787	0.930	1.025	1.120	1.262	73	0.731	0.873	0.968	1.063	1.206
36	0.786	0.928	1.023	1.118	1.261	74	0.724	0.866	0.961	1.056	1.199
37	0.785	0.927	1.022	1.117	1.259	75	0.716	0.858	0.953	1.048	1.191
38	0.783	0.926	1.021	1.116	1.258	76	0.707	0.849	0.944	1.039	1.181
39	0.782	0.925	1.020	1.115	1.257	77	0.696	0.839	0.934	1.028	1.171
40	0.781	0.924	1.019	1.113	1.256	78	0.684	0.827	0.922	1.016	1.159
41	0.780	0.922	1.017	1.112	1.255	79	0.671	0.813	0.908	1.003	1.145
42	0.779	0.921	1.016	1.111	1.254	80	0.655	0.798	0.893	0.988	1.130
43	0.778	0.921	1.016	1.110	1.253						
44	0.777	0.920	1.015	1.110	1.252						

Table IV.8
BONE MINERAL DENSITY Z SCORE VALUES OF RIBS FOR MALE POPULATION

Age	Z SCORE					Age	Z SCORE				
	-2.5	-1.0	0.0	1.0	2.5		-2.5	-1.0	0.0	1.0	2.5
7	0.336	0.447	0.522	0.596	0.708	45	0.589	0.700	0.775	0.849	2.766
8	0.368	0.480	0.554	0.629	0.708	46	0.588	0.700	0.774	0.849	2.763
9	0.399	0.511	0.585	0.660	0.585	47	0.587	0.699	0.774	0.848	2.761
10	0.428	0.539	0.614	0.688	0.614	48	0.587	0.698	0.773	0.847	2.759
11	0.454	0.566	0.640	0.715	1.998	49	0.586	0.698	0.772	0.847	2.757
12	0.478	0.590	0.664	0.739	2.102	50	0.586	0.697	0.772	0.846	2.754
13	0.500	0.612	0.687	0.761	2.200	51	0.585	0.697	0.771	0.846	2.752
14	0.521	0.632	0.707	0.781	2.290	52	0.585	0.696	0.771	0.845	2.750
15	0.539	0.650	0.725	0.799	2.374	53	0.584	0.696	0.770	0.845	2.748
16	0.554	0.666	0.741	0.815	2.450	54	0.583	0.695	0.770	0.844	2.747
17	0.568	0.680	0.754	0.829	2.519	55	0.583	0.694	0.769	0.843	2.745
18	0.580	0.692	0.766	0.840	2.581	56	0.582	0.694	0.768	0.843	2.743
19	0.589	0.701	0.775	0.850	2.635	57	0.581	0.693	0.768	0.842	2.741
20	0.597	0.708	0.783	0.857	2.683	58	0.581	0.693	0.767	0.841	2.739
21	0.602	0.714	0.788	0.863	2.723	59	0.580	0.692	0.766	0.841	2.736
22	0.606	0.718	0.792	0.867	2.756	60	0.579	0.691	0.766	0.840	2.734
23	0.609	0.720	0.795	0.869	2.782	61	0.579	0.690	0.765	0.839	2.732
24	0.610	0.721	0.796	0.870	2.802	62	0.578	0.689	0.764	0.838	2.729
25	0.610	0.722	0.796	0.871	2.815	63	0.577	0.689	0.763	0.837	2.726
26	0.609	0.721	0.796	0.870	2.824	64	0.576	0.688	0.762	0.837	2.724
27	0.608	0.720	0.794	0.869	2.829	65	0.575	0.687	0.761	0.836	2.721
28	0.607	0.718	0.793	0.867	2.830	66	0.574	0.685	0.760	0.834	2.717
29	0.605	0.717	0.791	0.866	2.829	67	0.572	0.684	0.759	0.833	2.714
30	0.603	0.715	0.790	0.864	2.826	68	0.571	0.683	0.757	0.832	2.710
31	0.602	0.714	0.788	0.863	2.821	69	0.569	0.681	0.755	0.830	2.706
32	0.601	0.712	0.787	0.861	2.816	70	0.567	0.679	0.753	0.828	2.701
33	0.599	0.711	0.785	0.860	2.811	71	0.565	0.677	0.751	0.826	2.696
34	0.598	0.710	0.784	0.859	2.806	72	0.562	0.674	0.748	0.823	2.689
35	0.597	0.709	0.783	0.858	2.801	73	0.559	0.671	0.745	0.820	2.682
36	0.596	0.708	0.782	0.856	2.797	74	0.556	0.667	0.742	0.816	2.674
37	0.595	0.706	0.781	0.855	2.792	75	0.552	0.663	0.738	0.812	2.664
38	0.594	0.706	0.780	0.855	2.788	76	0.547	0.659	0.733	0.808	2.653
39	0.593	0.705	0.779	0.854	2.785	77	0.542	0.654	0.728	0.802	2.640
40	0.592	0.704	0.778	0.853	2.781	78	0.536	0.648	0.722	0.797	2.625
41	0.591	0.703	0.778	0.852	2.778	79	0.529	0.641	0.716	0.790	2.609
42	0.591	0.702	0.777	0.851	2.774	80	0.522	0.634	0.708	0.783	2.590
43	0.590	0.702	0.776	0.851	2.771						
44	0.589	0.701	0.775	0.850	2.769						

Table IV.9
BONE MINERAL DENSITY Z SCORE VALUES OF PELVIS FOR MALE POPULATION

Age	Z SCORE					Age	Z SCORE				
	-2.5	-1.0	0.0	1.0	2.5		-2.5	-1.0	0.0	1.0	2.5
7	0.318	0.520	0.654	0.789	0.991	45	0.877	1.079	1.213	1.348	1.549
8	0.394	0.595	0.730	0.864	1.066	46	0.875	1.077	1.212	1.346	1.548
9	0.464	0.666	0.800	0.934	1.136	47	0.874	1.076	1.210	1.344	1.546
10	0.529	0.731	0.865	1.000	1.202	48	0.872	1.074	1.209	1.343	1.545
11	0.590	0.791	0.926	1.060	1.262	49	0.871	1.073	1.207	1.341	1.543
12	0.645	0.847	0.981	1.116	1.317	50	0.869	1.071	1.205	1.340	1.542
13	0.696	0.897	1.032	1.166	1.368	51	0.868	1.069	1.204	1.338	1.540
14	0.741	0.943	1.077	1.212	1.414	52	0.866	1.068	1.202	1.337	1.538
15	0.782	0.984	1.118	1.253	1.454	53	0.864	1.066	1.200	1.335	1.537
16	0.818	1.019	1.154	1.288	1.490	54	0.863	1.064	1.199	1.333	1.535
17	0.849	1.050	1.185	1.319	1.521	55	0.861	1.062	1.197	1.331	1.533
18	0.874	1.076	1.211	1.345	1.547	56	0.859	1.060	1.195	1.329	1.531
19	0.895	1.097	1.231	1.366	1.568	57	0.856	1.058	1.193	1.327	1.529
20	0.911	1.113	1.247	1.382	1.584	58	0.854	1.056	1.190	1.325	1.526
21	0.923	1.125	1.259	1.394	1.595	59	0.852	1.053	1.188	1.322	1.524
22	0.931	1.132	1.267	1.401	1.603	60	0.849	1.050	1.185	1.319	1.521
23	0.935	1.137	1.271	1.406	1.607	61	0.846	1.048	1.182	1.316	1.518
24	0.937	1.138	1.273	1.407	1.609	62	0.843	1.044	1.179	1.313	1.515
25	0.936	1.138	1.272	1.407	1.608	63	0.839	1.041	1.175	1.310	1.511
26	0.933	1.135	1.270	1.404	1.606	64	0.836	1.037	1.172	1.306	1.508
27	0.930	1.131	1.266	1.400	1.602	65	0.832	1.033	1.168	1.302	1.504
28	0.925	1.127	1.261	1.396	1.597	66	0.827	1.029	1.163	1.298	1.499
29	0.921	1.122	1.257	1.391	1.593	67	0.822	1.024	1.159	1.293	1.495
30	0.916	1.118	1.252	1.387	1.588	68	0.817	1.019	1.153	1.288	1.489
31	0.912	1.114	1.248	1.383	1.584	69	0.811	1.013	1.147	1.282	1.483
32	0.908	1.110	1.244	1.379	1.580	70	0.804	1.006	1.141	1.275	1.477
33	0.905	1.106	1.241	1.375	1.577	71	0.797	0.999	1.133	1.268	1.469
34	0.901	1.103	1.237	1.372	1.573	72	0.789	0.990	1.125	1.259	1.461
35	0.898	1.100	1.234	1.369	1.570	73	0.780	0.981	1.116	1.250	1.452
36	0.895	1.097	1.231	1.366	1.568	74	0.769	0.971	1.105	1.240	1.441
37	0.893	1.094	1.229	1.363	1.565	75	0.758	0.960	1.094	1.228	1.430
38	0.890	1.092	1.226	1.361	1.563	76	0.745	0.947	1.081	1.216	1.418
39	0.888	1.090	1.224	1.359	1.560	77	0.732	0.933	1.068	1.202	1.404
40	0.886	1.088	1.222	1.356	1.558	78	0.716	0.918	1.052	1.187	1.389
41	0.884	1.086	1.220	1.354	1.556	79	0.700	0.901	1.036	1.170	1.372
42	0.882	1.084	1.218	1.353	1.554	80	0.682	0.883	1.018	1.152	1.354
43	0.880	1.082	1.216	1.351	1.553						
44	0.879	1.080	1.215	1.349	1.551						

Table IV.10
BONE MINERAL DENSITY Z SCORE VALUES OF SUBTOTAL BODY FOR FEMALE POPULATION

Age	Z SCORE					Age	Z SCORE				
	-2.5	-1.0	0.0	1.0	2.5		-2.5	-1.0	0.0	1.0	2.5
7	0.622	0.741	0.820	0.899	1.018	45	0.949	1.067	1.147	1.226	1.345
8	0.661	0.780	0.859	0.938	1.057	46	0.945	1.064	1.143	1.222	1.341
9	0.697	0.816	0.895	0.975	1.093	47	0.941	1.059	1.139	1.218	1.337
10	0.732	0.850	0.930	1.009	1.128	48	0.936	1.055	1.134	1.214	1.332
11	0.764	0.882	0.962	1.041	1.160	49	0.932	1.051	1.130	1.209	1.328
12	0.793	0.912	0.991	1.071	1.189	50	0.927	1.046	1.125	1.204	1.323
13	0.821	0.940	1.019	1.098	1.217	51	0.922	1.041	1.120	1.199	1.318
14	0.846	0.965	1.044	1.123	1.242	52	0.917	1.036	1.115	1.194	1.313
15	0.869	0.988	1.067	1.146	1.265	53	0.911	1.030	1.110	1.189	1.308
16	0.889	1.008	1.087	1.167	1.285	54	0.906	1.025	1.104	1.183	1.302
17	0.907	1.026	1.106	1.185	1.304	55	0.900	1.019	1.098	1.178	1.296
18	0.923	1.042	1.121	1.201	1.320	56	0.894	1.013	1.092	1.172	1.291
19	0.937	1.056	1.135	1.214	1.333	57	0.888	1.007	1.086	1.166	1.284
20	0.948	1.067	1.147	1.226	1.345	58	0.882	1.001	1.080	1.159	1.278
21	0.958	1.077	1.156	1.235	1.354	59	0.875	0.994	1.074	1.153	1.272
22	0.965	1.084	1.163	1.242	1.361	60	0.869	0.988	1.067	1.146	1.265
23	0.971	1.090	1.169	1.248	1.367	61	0.862	0.981	1.060	1.139	1.258
24	0.975	1.094	1.173	1.252	1.371	62	0.855	0.974	1.053	1.132	1.251
25	0.978	1.097	1.176	1.255	1.374	63	0.848	0.967	1.046	1.125	1.244
26	0.980	1.099	1.178	1.257	1.376	64	0.841	0.959	1.039	1.118	1.237
27	0.981	1.100	1.179	1.258	1.377	65	0.833	0.952	1.031	1.110	1.229
28	0.982	1.100	1.180	1.259	1.378	66	0.826	0.944	1.024	1.103	1.222
29	0.982	1.100	1.180	1.259	1.378	67	0.818	0.937	1.016	1.095	1.214
30	0.981	1.100	1.179	1.259	1.377	68	0.811	0.929	1.009	1.088	1.207
31	0.981	1.100	1.179	1.258	1.377	69	0.803	0.922	1.001	1.081	1.200
32	0.980	1.099	1.178	1.257	1.376	70	0.796	0.915	0.994	1.074	1.193
33	0.979	1.098	1.177	1.256	1.375	71	0.790	0.909	0.988	1.067	1.186
34	0.978	1.096	1.176	1.255	1.374	72	0.784	0.903	0.982	1.061	1.180
35	0.976	1.095	1.174	1.253	1.372	73	0.778	0.897	0.976	1.056	1.175
36	0.974	1.093	1.172	1.252	1.370	74	0.774	0.892	0.972	1.051	1.170
37	0.972	1.091	1.170	1.250	1.369	75	0.770	0.888	0.968	1.047	1.166
38	0.970	1.089	1.168	1.247	1.366	76	0.766	0.885	0.964	1.044	1.163
39	0.968	1.087	1.166	1.245	1.364	77	0.764	0.883	0.962	1.041	1.160
40	0.965	1.084	1.163	1.242	1.361	78	0.763	0.882	0.961	1.040	1.159
41	0.962	1.081	1.160	1.240	1.358	79	0.761	0.880	0.959	1.038	1.157
42	0.959	1.078	1.157	1.236	1.355	80	0.759	0.878	0.957	1.036	1.155
43	0.956	1.075	1.154	1.233	1.352						
44	0.952	1.071	1.150	1.230	1.349						

Table IV.11
BONE MINERAL DENSITY Z SCORE VALUES OF LUMBAR REGION FOR FEMALE POPULATION

Age	Z SCORE					Age	Z SCORE				
	-2.5	-1.0	0.0	1.0	2.5		-2.5	-1.0	0.0	1.0	2.5
7	0.315	0.517	0.652	0.787	0.988	45	0.782	0.984	1.118	1.253	1.455
8	0.368	0.570	0.705	0.839	1.041	46	0.774	0.976	1.111	1.245	1.447
9	0.418	0.620	0.755	0.889	1.091	47	0.766	0.968	1.102	1.237	1.439
10	0.465	0.667	0.802	0.936	1.138	48	0.758	0.960	1.094	1.229	1.431
11	0.509	0.711	0.846	0.980	1.182	49	0.749	0.951	1.086	1.220	1.422
12	0.550	0.752	0.887	1.021	1.223	50	0.741	0.942	1.077	1.212	1.414
13	0.589	0.791	0.925	1.060	1.262	51	0.732	0.934	1.068	1.203	1.405
14	0.624	0.826	0.961	1.095	1.297	52	0.723	0.925	1.059	1.194	1.396
15	0.657	0.859	0.993	1.128	1.330	53	0.714	0.916	1.051	1.185	1.387
16	0.686	0.888	1.023	1.158	1.359	54	0.705	0.907	1.042	1.176	1.378
17	0.713	0.915	1.050	1.184	1.386	55	0.696	0.898	1.033	1.167	1.369
18	0.737	0.939	1.074	1.208	1.410	56	0.687	0.889	1.024	1.158	1.360
19	0.758	0.960	1.095	1.229	1.431	57	0.678	0.880	1.015	1.149	1.351
20	0.776	0.978	1.113	1.247	1.449	58	0.670	0.871	1.006	1.141	1.343
21	0.792	0.994	1.128	1.263	1.465	59	0.661	0.863	0.997	1.132	1.334
22	0.805	1.007	1.141	1.276	1.478	60	0.652	0.854	0.989	1.124	1.325
23	0.816	1.018	1.152	1.287	1.489	61	0.644	0.846	0.981	1.115	1.317
24	0.825	1.026	1.161	1.296	1.498	62	0.636	0.838	0.973	1.107	1.309
25	0.831	1.033	1.168	1.303	1.504	63	0.628	0.830	0.965	1.099	1.301
26	0.837	1.039	1.173	1.308	1.510	64	0.621	0.823	0.957	1.092	1.294
27	0.841	1.042	1.177	1.312	1.514	65	0.614	0.815	0.950	1.085	1.287
28	0.843	1.045	1.180	1.314	1.516	66	0.607	0.809	0.943	1.078	1.280
29	0.845	1.047	1.181	1.316	1.518	67	0.600	0.802	0.936	1.071	1.273
30	0.845	1.047	1.182	1.317	1.519	68	0.594	0.795	0.930	1.065	1.267
31	0.845	1.047	1.182	1.317	1.518	69	0.587	0.789	0.924	1.058	1.260
32	0.845	1.047	1.181	1.316	1.518	70	0.581	0.783	0.918	1.052	1.254
33	0.843	1.045	1.180	1.314	1.516	71	0.575	0.777	0.912	1.046	1.248
34	0.841	1.043	1.178	1.312	1.514	72	0.570	0.771	0.906	1.041	1.243
35	0.838	1.040	1.175	1.309	1.511	73	0.564	0.766	0.900	1.035	1.237
36	0.835	1.037	1.171	1.306	1.508	74	0.558	0.760	0.895	1.029	1.231
37	0.831	1.033	1.167	1.302	1.504	75	0.553	0.755	0.889	1.024	1.226
38	0.826	1.028	1.163	1.297	1.499	76	0.547	0.749	0.884	1.018	1.220
39	0.821	1.023	1.158	1.292	1.494	77	0.541	0.743	0.878	1.012	1.214
40	0.816	1.018	1.152	1.287	1.489	78	0.536	0.738	0.872	1.007	1.209
41	0.810	1.012	1.146	1.281	1.483	79	0.530	0.732	0.866	1.001	1.203
42	0.803	1.005	1.140	1.274	1.476	80	0.524	0.726	0.860	0.995	1.197
43	0.796	0.998	1.133	1.268	1.469						
44	0.789	0.991	1.126	1.260	1.462						

Table IV.12
BONE MINERAL DENSITY Z SCORE VALUES OF HIP FOR FEMALE POPULATION

Age	Z SCORE					Age	Z SCORE				
	-2.5	-1.0	0.0	1.0	2.5		-2.5	-1.0	0.0	1.0	2.5
7	0.444	0.623	0.743	0.863	1.042	45	0.714	0.893	1.013	1.133	1.312
8	0.483	0.662	0.782	0.902	1.081	46	0.710	0.889	1.009	1.129	1.308
9	0.519	0.699	0.819	0.938	1.118	47	0.706	0.885	1.005	1.125	1.304
10	0.554	0.733	0.853	0.972	1.152	48	0.701	0.881	1.001	1.120	1.300
11	0.585	0.765	0.884	1.004	1.183	49	0.697	0.877	0.996	1.116	1.295
12	0.614	0.793	0.913	1.033	1.212	50	0.692	0.872	0.992	1.111	1.291
13	0.640	0.820	0.940	1.059	1.239	51	0.688	0.867	0.987	1.106	1.286
14	0.664	0.844	0.964	1.083	1.263	52	0.682	0.862	0.982	1.101	1.281
15	0.686	0.865	0.985	1.105	1.284	53	0.677	0.857	0.976	1.096	1.276
16	0.705	0.884	1.004	1.124	1.303	54	0.672	0.851	0.971	1.091	1.270
17	0.721	0.901	1.020	1.140	1.319	55	0.666	0.846	0.965	1.085	1.264
18	0.735	0.914	1.034	1.154	1.333	56	0.660	0.840	0.959	1.079	1.259
19	0.746	0.926	1.045	1.165	1.345	57	0.654	0.833	0.953	1.073	1.252
20	0.755	0.935	1.054	1.174	1.354	58	0.648	0.827	0.947	1.066	1.246
21	0.762	0.941	1.061	1.181	1.360	59	0.641	0.820	0.940	1.060	1.239
22	0.766	0.946	1.066	1.185	1.365	60	0.634	0.813	0.933	1.053	1.232
23	0.769	0.949	1.068	1.188	1.368	61	0.627	0.806	0.926	1.046	1.225
24	0.770	0.950	1.070	1.189	1.369	62	0.619	0.799	0.918	1.038	1.218
25	0.770	0.950	1.070	1.189	1.369	63	0.611	0.791	0.911	1.030	1.210
26	0.770	0.949	1.069	1.188	1.368	64	0.603	0.783	0.903	1.022	1.202
27	0.768	0.947	1.067	1.187	1.366	65	0.595	0.774	0.894	1.014	1.193
28	0.765	0.945	1.065	1.184	1.364	66	0.586	0.766	0.886	1.005	1.185
29	0.763	0.942	1.062	1.182	1.361	67	0.578	0.757	0.877	0.997	1.176
30	0.760	0.940	1.060	1.179	1.359	68	0.569	0.749	0.868	0.988	1.168
31	0.758	0.937	1.057	1.177	1.356	69	0.561	0.740	0.860	0.980	1.159
32	0.755	0.935	1.054	1.174	1.354	70	0.552	0.732	0.852	0.971	1.151
33	0.752	0.932	1.052	1.171	1.351	71	0.545	0.724	0.844	0.963	1.143
34	0.750	0.929	1.049	1.169	1.348	72	0.537	0.717	0.836	0.956	1.136
35	0.747	0.926	1.046	1.166	1.345	73	0.530	0.710	0.829	0.949	1.129
36	0.744	0.924	1.043	1.163	1.342	74	0.524	0.704	0.823	0.943	1.123
37	0.741	0.921	1.040	1.160	1.339	75	0.519	0.698	0.818	0.938	1.117
38	0.738	0.918	1.037	1.157	1.336	76	0.514	0.694	0.814	0.933	1.113
39	0.735	0.914	1.034	1.154	1.333	77	0.511	0.691	0.810	0.930	1.109
40	0.732	0.911	1.031	1.151	1.330	78	0.509	0.688	0.808	0.928	1.107
41	0.728	0.908	1.028	1.147	1.327	79	0.507	0.686	0.806	0.926	1.105
42	0.725	0.905	1.024	1.144	1.323	80	0.505	0.684	0.804	0.924	1.103
43	0.721	0.901	1.021	1.140	1.320						
44	0.718	0.897	1.017	1.137	1.316						

Table IV.13
BONE MINERAL DENSITY Z SCORE VALUES OF HEAD FOR FEMALE POPULATION

Age	Z SCORE					Age	Z SCORE				
	-2.5	-1.0	0.0	1.0	2.5		-2.5	-1.0	0.0	1.0	2.5
7	0.637	1.048	1.322	1.597	2.008	45	1.697	2.108	2.382	2.657	3.068
8	0.744	1.156	1.430	1.704	2.116	46	1.685	2.096	2.371	2.645	3.056
9	0.846	1.258	1.532	1.806	2.217	47	1.673	2.084	2.358	2.633	3.044
10	0.942	1.354	1.628	1.902	2.314	48	1.660	2.071	2.346	2.620	3.031
11	1.033	1.444	1.719	1.993	2.404	49	1.647	2.058	2.332	2.607	3.018
12	1.118	1.529	1.804	2.078	2.489	50	1.633	2.045	2.319	2.593	3.005
13	1.197	1.608	1.883	2.157	2.568	51	1.620	2.031	2.305	2.579	2.991
14	1.271	1.682	1.956	2.231	2.642	52	1.605	2.017	2.291	2.565	2.977
15	1.339	1.750	2.024	2.298	2.710	53	1.591	2.003	2.277	2.551	2.962
16	1.401	1.812	2.086	2.361	2.772	54	1.577	1.988	2.263	2.537	2.948
17	1.457	1.869	2.143	2.417	2.828	55	1.563	1.974	2.248	2.522	2.934
18	1.508	1.919	2.194	2.468	2.879	56	1.548	1.960	2.234	2.508	2.919
19	1.553	1.965	2.239	2.513	2.925	57	1.534	1.945	2.219	2.494	2.905
20	1.593	2.004	2.278	2.553	2.964	58	1.520	1.931	2.205	2.480	2.891
21	1.627	2.039	2.313	2.587	2.998	59	1.506	1.917	2.191	2.466	2.877
22	1.657	2.068	2.342	2.616	3.028	60	1.492	1.903	2.178	2.452	2.863
23	1.682	2.093	2.367	2.641	3.053	61	1.479	1.890	2.164	2.439	2.850
24	1.703	2.114	2.388	2.662	3.074	62	1.466	1.877	2.151	2.426	2.837
25	1.720	2.131	2.406	2.680	3.091	63	1.453	1.865	2.139	2.413	2.824
26	1.734	2.145	2.420	2.694	3.105	64	1.441	1.853	2.127	2.401	2.812
27	1.745	2.157	2.431	2.705	3.117	65	1.430	1.841	2.115	2.390	2.801
28	1.754	2.166	2.440	2.714	3.125	66	1.419	1.830	2.104	2.378	2.790
29	1.761	2.172	2.447	2.721	3.132	67	1.408	1.819	2.093	2.368	2.779
30	1.766	2.178	2.452	2.726	3.138	68	1.397	1.809	2.083	2.357	2.768
31	1.770	2.181	2.456	2.730	3.141	69	1.387	1.798	2.072	2.346	2.758
32	1.772	2.184	2.458	2.732	3.144	70	1.376	1.787	2.061	2.336	2.747
33	1.773	2.185	2.459	2.733	3.144	71	1.365	1.776	2.050	2.324	2.736
34	1.773	2.184	2.458	2.733	3.144	72	1.353	1.764	2.039	2.313	2.724
35	1.771	2.182	2.457	2.731	3.142	73	1.341	1.752	2.027	2.301	2.712
36	1.768	2.179	2.454	2.728	3.139	74	1.328	1.739	2.014	2.288	2.699
37	1.764	2.175	2.450	2.724	3.135	75	1.314	1.726	2.000	2.274	2.686
38	1.759	2.170	2.444	2.719	3.130	76	1.300	1.711	1.985	2.259	2.671
39	1.753	2.164	2.438	2.712	3.124	77	1.284	1.695	1.969	2.244	2.655
40	1.745	2.157	2.431	2.705	3.117	78	1.266	1.678	1.952	2.226	2.638
41	1.737	2.149	2.423	2.697	3.108	79	1.248	1.659	1.933	2.208	2.619
42	1.728	2.140	2.414	2.688	3.099	80	1.227	1.639	1.913	2.187	2.599
43	1.718	2.130	2.404	2.678	3.090						
44	1.708	2.119	2.394	2.668	3.079						

Table IV.14
BONE MINERAL DENSITY Z SCORE VALUES OF ARM FOR FEMALE POPULATION

Age	Z SCORE					Age	Z SCORE				
	-2.5	-1.0	0.0	1.0	2.5		-2.5	-1.0	0.0	1.0	2.5
7	0.346	0.479	0.567	0.655	0.788	45	0.617	0.749	0.838	0.926	1.059
8	0.375	0.508	0.596	0.685	0.817	46	0.613	0.746	0.834	0.923	1.055
9	0.403	0.536	0.624	0.712	0.845	47	0.610	0.743	0.831	0.919	1.052
10	0.429	0.562	0.650	0.739	0.871	48	0.606	0.739	0.827	0.916	1.048
11	0.454	0.586	0.675	0.763	0.895	49	0.602	0.735	0.823	0.912	1.044
12	0.476	0.609	0.697	0.786	0.918	50	0.598	0.731	0.819	0.907	1.040
13	0.498	0.630	0.718	0.807	0.939	51	0.594	0.726	0.815	0.903	1.036
14	0.517	0.650	0.738	0.826	0.959	52	0.589	0.722	0.810	0.898	1.031
15	0.535	0.667	0.756	0.844	0.977	53	0.584	0.717	0.805	0.893	1.026
16	0.551	0.684	0.772	0.860	0.993	54	0.579	0.712	0.800	0.888	1.021
17	0.566	0.698	0.787	0.875	1.007	55	0.574	0.706	0.795	0.883	1.015
18	0.578	0.711	0.799	0.888	1.020	56	0.568	0.701	0.789	0.877	1.010
19	0.590	0.722	0.811	0.899	1.032	57	0.562	0.695	0.783	0.872	1.004
20	0.599	0.732	0.820	0.909	1.041	58	0.556	0.689	0.777	0.865	0.998
21	0.607	0.740	0.828	0.917	1.049	59	0.550	0.682	0.771	0.859	0.992
22	0.614	0.747	0.835	0.924	1.056	60	0.543	0.676	0.764	0.853	0.985
23	0.620	0.752	0.841	0.929	1.062	61	0.537	0.669	0.758	0.846	0.979
24	0.624	0.757	0.845	0.933	1.066	62	0.530	0.662	0.751	0.839	0.972
25	0.628	0.760	0.849	0.937	1.070	63	0.523	0.655	0.744	0.832	0.964
26	0.630	0.763	0.851	0.940	1.072	64	0.515	0.648	0.736	0.825	0.957
27	0.632	0.765	0.853	0.942	1.074	65	0.508	0.640	0.729	0.817	0.950
28	0.634	0.766	0.855	0.943	1.076	66	0.500	0.633	0.721	0.809	0.942
29	0.635	0.767	0.856	0.944	1.077	67	0.492	0.625	0.713	0.802	0.934
30	0.636	0.768	0.857	0.945	1.077	68	0.485	0.617	0.706	0.794	0.927
31	0.636	0.769	0.857	0.945	1.078	69	0.477	0.610	0.698	0.787	0.919
32	0.636	0.769	0.857	0.946	1.078	70	0.470	0.603	0.691	0.779	0.912
33	0.636	0.769	0.857	0.946	1.078	71	0.463	0.596	0.684	0.773	0.905
34	0.636	0.769	0.857	0.945	1.078	72	0.457	0.590	0.678	0.766	0.899
35	0.636	0.768	0.857	0.945	1.077	73	0.452	0.584	0.672	0.761	0.893
36	0.635	0.767	0.856	0.944	1.077	74	0.447	0.579	0.667	0.756	0.888
37	0.634	0.766	0.855	0.943	1.076	75	0.442	0.575	0.663	0.752	0.884
38	0.633	0.765	0.853	0.942	1.074	76	0.439	0.572	0.660	0.748	0.881
39	0.631	0.764	0.852	0.940	1.073	77	0.437	0.569	0.658	0.746	0.879
40	0.629	0.762	0.850	0.939	1.071	78	0.435	0.568	0.656	0.744	0.877
41	0.627	0.760	0.848	0.936	1.069	79	0.433	0.566	0.654	0.742	0.875
42	0.625	0.758	0.846	0.934	1.067	80	0.431	0.564	0.652	0.740	0.873
43	0.622	0.755	0.843	0.932	1.064						
44	0.620	0.752	0.841	0.929	1.062						

Table IV.15
BONE MINERAL DENSITY Z SCORE VALUES OF PROXIMAL FEMUR FOR FEMALE POPULATION

Age	Z SCORE					Age	Z SCORE				
	-2.5	-1.0	0.0	1.0	2.5		-2.5	-1.0	0.0	1.0	2.5
7	0.588	0.719	0.806	0.893	1.023	45	0.912	1.042	1.129	1.217	1.347
8	0.636	0.767	0.854	0.941	1.072	46	0.909	1.040	1.127	1.214	1.344
9	0.681	0.812	0.899	0.986	1.117	47	0.906	1.037	1.124	1.211	1.342
10	0.723	0.854	0.941	1.028	1.159	48	0.903	1.034	1.121	1.208	1.339
11	0.762	0.893	0.980	1.067	1.197	49	0.900	1.031	1.118	1.205	1.335
12	0.797	0.928	1.015	1.102	1.233	50	0.897	1.027	1.114	1.201	1.332
13	0.829	0.960	1.047	1.134	1.265	51	0.893	1.024	1.111	1.198	1.328
14	0.858	0.989	1.076	1.163	1.294	52	0.889	1.020	1.107	1.194	1.324
15	0.884	1.014	1.101	1.188	1.319	53	0.885	1.016	1.103	1.190	1.320
16	0.906	1.037	1.124	1.211	1.341	54	0.880	1.011	1.098	1.185	1.316
17	0.925	1.056	1.143	1.230	1.360	55	0.876	1.006	1.093	1.180	1.311
18	0.941	1.071	1.158	1.245	1.376	56	0.871	1.001	1.088	1.175	1.306
19	0.953	1.084	1.171	1.258	1.389	57	0.865	0.996	1.083	1.170	1.300
20	0.962	1.093	1.180	1.267	1.398	58	0.859	0.990	1.077	1.164	1.295
21	0.969	1.099	1.187	1.274	1.404	59	0.853	0.983	1.071	1.158	1.288
22	0.973	1.103	1.190	1.277	1.408	60	0.846	0.977	1.064	1.151	1.281
23	0.974	1.105	1.192	1.279	1.410	61	0.839	0.969	1.057	1.144	1.274
24	0.974	1.105	1.192	1.279	1.409	62	0.831	0.962	1.049	1.136	1.267
25	0.972	1.103	1.190	1.277	1.408	63	0.823	0.953	1.041	1.128	1.258
26	0.969	1.100	1.187	1.274	1.405	64	0.814	0.945	1.032	1.119	1.249
27	0.966	1.096	1.183	1.271	1.401	65	0.805	0.935	1.022	1.110	1.240
28	0.962	1.092	1.179	1.266	1.397	66	0.795	0.926	1.013	1.100	1.230
29	0.958	1.088	1.175	1.262	1.393	67	0.785	0.916	1.003	1.090	1.221
30	0.954	1.084	1.171	1.258	1.389	68	0.775	0.906	0.993	1.080	1.211
31	0.950	1.081	1.168	1.255	1.385	69	0.765	0.896	0.983	1.070	1.201
32	0.946	1.077	1.164	1.251	1.382	70	0.756	0.887	0.974	1.061	1.191
33	0.943	1.074	1.161	1.248	1.379	71	0.747	0.878	0.965	1.052	1.182
34	0.940	1.071	1.158	1.245	1.376	72	0.739	0.869	0.956	1.043	1.174
35	0.937	1.068	1.155	1.242	1.373	73	0.731	0.862	0.949	1.036	1.167
36	0.935	1.065	1.152	1.239	1.370	74	0.725	0.855	0.943	1.030	1.160
37	0.932	1.062	1.150	1.237	1.367	75	0.720	0.850	0.937	1.024	1.155
38	0.929	1.060	1.147	1.234	1.365	76	0.716	0.846	0.934	1.021	1.151
39	0.927	1.057	1.145	1.232	1.362	77	0.714	0.844	0.931	1.018	1.149
40	0.924	1.055	1.142	1.229	1.360	78	0.711	0.842	0.929	1.016	1.147
41	0.922	1.053	1.140	1.227	1.357	79	0.709	0.840	0.927	1.014	1.145
42	0.919	1.050	1.137	1.224	1.355	80	0.707	0.838	0.925	1.012	1.143
43	0.917	1.048	1.135	1.222	1.352						
44	0.914	1.045	1.132	1.219	1.350						

Table IV.16
BONE MINERAL DENSITY Z SCORE VALUES OF TRUNK FOR FEMALE POPULATION

Age	Z SCORE					Age	Z SCORE				
	-2.5	-1.0	0.0	1.0	2.5		-2.5	-1.0	0.0	1.0	2.5
7	0.446	0.565	0.644	0.724	0.843	45	0.751	0.870	0.950	1.029	1.148
8	0.483	0.602	0.682	0.761	0.880	46	0.748	0.867	0.946	1.026	1.145
9	0.518	0.638	0.717	0.797	0.916	47	0.744	0.863	0.943	1.022	1.141
10	0.551	0.671	0.750	0.830	0.949	48	0.740	0.860	0.939	1.019	1.138
11	0.582	0.701	0.781	0.860	0.980	49	0.737	0.856	0.935	1.015	1.134
12	0.611	0.730	0.809	0.889	1.008	50	0.733	0.852	0.931	1.011	1.130
13	0.637	0.756	0.836	0.915	1.034	51	0.728	0.848	0.927	1.007	1.126
14	0.661	0.780	0.860	0.939	1.058	52	0.724	0.843	0.923	1.002	1.121
15	0.683	0.802	0.881	0.961	1.080	53	0.720	0.839	0.918	0.998	1.117
16	0.702	0.821	0.901	0.980	1.099	54	0.715	0.834	0.914	0.993	1.112
17	0.719	0.838	0.918	0.997	1.117	55	0.710	0.830	0.909	0.989	1.108
18	0.734	0.853	0.933	1.012	1.132	56	0.706	0.825	0.904	0.984	1.103
19	0.747	0.866	0.946	1.025	1.144	57	0.701	0.820	0.899	0.979	1.098
20	0.757	0.876	0.956	1.035	1.155	58	0.695	0.815	0.894	0.974	1.093
21	0.766	0.885	0.964	1.044	1.163	59	0.690	0.809	0.889	0.968	1.088
22	0.772	0.891	0.971	1.050	1.170	60	0.685	0.804	0.884	0.963	1.082
23	0.777	0.896	0.976	1.055	1.174	61	0.679	0.799	0.878	0.957	1.077
24	0.781	0.900	0.979	1.059	1.178	62	0.674	0.793	0.872	0.952	1.071
25	0.783	0.902	0.981	1.061	1.180	63	0.668	0.787	0.867	0.946	1.065
26	0.784	0.903	0.983	1.062	1.181	64	0.662	0.781	0.861	0.940	1.059
27	0.784	0.904	0.983	1.063	1.182	65	0.656	0.775	0.855	0.934	1.053
28	0.784	0.903	0.983	1.062	1.182	66	0.650	0.769	0.849	0.928	1.047
29	0.784	0.903	0.982	1.062	1.181	67	0.644	0.763	0.843	0.922	1.041
30	0.783	0.902	0.982	1.061	1.180	68	0.638	0.757	0.837	0.916	1.035
31	0.782	0.901	0.981	1.060	1.179	69	0.632	0.751	0.831	0.910	1.029
32	0.781	0.900	0.980	1.059	1.178	70	0.626	0.745	0.825	0.904	1.023
33	0.780	0.899	0.978	1.058	1.177	71	0.620	0.740	0.819	0.899	1.018
34	0.778	0.897	0.977	1.056	1.175	72	0.615	0.734	0.814	0.893	1.012
35	0.776	0.896	0.975	1.055	1.174	73	0.610	0.729	0.809	0.888	1.007
36	0.775	0.894	0.973	1.053	1.172	74	0.605	0.724	0.804	0.883	1.002
37	0.773	0.892	0.971	1.051	1.170	75	0.601	0.720	0.799	0.879	0.998
38	0.771	0.890	0.969	1.049	1.168	76	0.597	0.716	0.795	0.875	0.994
39	0.768	0.887	0.967	1.046	1.166	77	0.593	0.712	0.792	0.871	0.991
40	0.766	0.885	0.964	1.044	1.163	78	0.590	0.710	0.789	0.868	0.988
41	0.763	0.882	0.962	1.041	1.161	79	0.588	0.707	0.787	0.866	0.985
42	0.760	0.880	0.959	1.039	1.158	80	0.586	0.706	0.785	0.865	0.984
43	0.757	0.877	0.956	1.036	1.155						
44	0.754	0.874	0.953	1.032	1.152						

Table IV.17
BONE MINERAL DENSITY Z SCORE VALUES OF RIBS FOR FEMALE POPULATION

Age	Z SCORE					Age	Z SCORE				
	-2.5	-1.0	0.0	1.0	2.5		-2.5	-1.0	0.0	1.0	2.5
7	0.400	0.492	0.553	0.614	0.706	45	0.565	0.657	0.718	0.780	0.872
8	0.423	0.515	0.576	0.637	0.729	46	0.563	0.655	0.717	0.778	0.870
9	0.444	0.536	0.598	0.659	0.751	47	0.562	0.653	0.715	0.776	0.868
10	0.465	0.556	0.618	0.679	0.771	48	0.560	0.652	0.713	0.774	0.866
11	0.483	0.575	0.636	0.698	0.790	49	0.558	0.650	0.711	0.772	0.864
12	0.500	0.592	0.654	0.715	0.807	50	0.556	0.648	0.709	0.770	0.862
13	0.516	0.608	0.669	0.730	0.822	51	0.553	0.645	0.707	0.768	0.860
14	0.530	0.622	0.683	0.745	0.837	52	0.551	0.643	0.704	0.766	0.858
15	0.543	0.635	0.696	0.757	0.849	53	0.549	0.641	0.702	0.763	0.855
16	0.554	0.646	0.707	0.768	0.860	54	0.546	0.638	0.700	0.761	0.853
17	0.564	0.656	0.717	0.778	0.870	55	0.544	0.636	0.697	0.758	0.850
18	0.572	0.664	0.725	0.786	0.878	56	0.541	0.633	0.694	0.756	0.848
19	0.578	0.670	0.732	0.793	0.885	57	0.538	0.630	0.692	0.753	0.845
20	0.584	0.676	0.737	0.798	0.890	58	0.536	0.627	0.689	0.750	0.842
21	0.588	0.680	0.741	0.802	0.894	59	0.532	0.624	0.686	0.747	0.839
22	0.590	0.682	0.744	0.805	0.897	60	0.529	0.621	0.683	0.744	0.836
23	0.592	0.684	0.745	0.806	0.898	61	0.526	0.618	0.679	0.741	0.832
24	0.593	0.685	0.746	0.807	0.899	62	0.523	0.615	0.676	0.737	0.829
25	0.593	0.685	0.746	0.807	0.899	63	0.519	0.611	0.672	0.733	0.825
26	0.592	0.684	0.745	0.807	0.899	64	0.515	0.607	0.668	0.730	0.822
27	0.591	0.683	0.744	0.806	0.898	65	0.511	0.603	0.665	0.726	0.818
28	0.590	0.682	0.743	0.804	0.896	66	0.507	0.599	0.661	0.722	0.814
29	0.589	0.681	0.742	0.803	0.895	67	0.503	0.595	0.656	0.718	0.810
30	0.587	0.679	0.740	0.802	0.894	68	0.499	0.591	0.652	0.713	0.805
31	0.586	0.678	0.739	0.800	0.892	69	0.494	0.586	0.648	0.709	0.801
32	0.584	0.676	0.738	0.799	0.891	70	0.490	0.582	0.643	0.705	0.796
33	0.583	0.675	0.736	0.798	0.889	71	0.485	0.577	0.639	0.700	0.792
34	0.582	0.674	0.735	0.796	0.888	72	0.481	0.573	0.634	0.695	0.787
35	0.580	0.672	0.734	0.795	0.887	73	0.476	0.568	0.629	0.691	0.783
36	0.579	0.671	0.732	0.793	0.885	74	0.471	0.563	0.625	0.686	0.778
37	0.578	0.669	0.731	0.792	0.884	75	0.467	0.559	0.620	0.681	0.773
38	0.576	0.668	0.729	0.791	0.883	76	0.462	0.554	0.615	0.677	0.769
39	0.575	0.667	0.728	0.789	0.881	77	0.457	0.549	0.611	0.672	0.764
40	0.573	0.665	0.726	0.788	0.880	78	0.453	0.545	0.606	0.667	0.759
41	0.572	0.664	0.725	0.786	0.878	79	0.448	0.540	0.601	0.663	0.755
42	0.570	0.662	0.723	0.785	0.877	80	0.443	0.535	0.597	0.658	0.750
43	0.568	0.660	0.722	0.783	0.875						
44	0.567	0.659	0.720	0.781	0.873						

Table IV.18
BONE MINERAL DENSITY Z SCORE VALUES OF PELVIS FOR FEMALE POPULATION

Age	Z SCORE					Age	Z SCORE				
	-2.5	-1.0	0.0	1.0	2.5		-2.5	-1.0	0.0	1.0	2.5
7	0.476	0.636	0.742	0.849	1.009	45	0.853	1.013	1.120	1.226	1.387
8	0.523	0.683	0.790	0.897	1.057	46	0.849	1.009	1.116	1.223	1.383
9	0.568	0.728	0.835	0.942	1.102	47	0.845	1.005	1.112	1.219	1.379
10	0.610	0.770	0.877	0.983	1.144	48	0.841	1.001	1.108	1.214	1.374
11	0.649	0.809	0.916	1.022	1.182	49	0.836	0.996	1.103	1.210	1.370
12	0.685	0.845	0.952	1.058	1.218	50	0.832	0.992	1.099	1.205	1.365
13	0.718	0.878	0.985	1.091	1.251	51	0.827	0.987	1.094	1.201	1.361
14	0.748	0.908	1.015	1.121	1.281	52	0.822	0.982	1.089	1.195	1.356
15	0.775	0.935	1.042	1.148	1.309	53	0.817	0.977	1.083	1.190	1.350
16	0.799	0.959	1.066	1.173	1.333	54	0.811	0.971	1.078	1.185	1.345
17	0.820	0.980	1.087	1.194	1.354	55	0.805	0.965	1.072	1.179	1.339
18	0.839	0.999	1.105	1.212	1.372	56	0.799	0.960	1.066	1.173	1.333
19	0.854	1.014	1.121	1.227	1.388	57	0.793	0.953	1.060	1.167	1.327
20	0.866	1.026	1.133	1.240	1.400	58	0.787	0.947	1.054	1.160	1.320
21	0.876	1.036	1.143	1.250	1.410	59	0.780	0.940	1.047	1.154	1.314
22	0.883	1.044	1.150	1.257	1.417	60	0.773	0.933	1.040	1.147	1.307
23	0.889	1.049	1.156	1.262	1.422	61	0.766	0.926	1.033	1.140	1.300
24	0.892	1.052	1.159	1.266	1.426	62	0.758	0.919	1.025	1.132	1.292
25	0.894	1.054	1.161	1.268	1.428	63	0.751	0.911	1.018	1.124	1.284
26	0.895	1.055	1.162	1.268	1.429	64	0.743	0.903	1.010	1.116	1.276
27	0.895	1.055	1.161	1.268	1.428	65	0.734	0.895	1.001	1.108	1.268
28	0.894	1.054	1.161	1.267	1.427	66	0.726	0.886	0.993	1.100	1.260
29	0.892	1.052	1.159	1.266	1.426	67	0.717	0.878	0.984	1.091	1.251
30	0.891	1.051	1.158	1.265	1.425	68	0.709	0.869	0.976	1.082	1.243
31	0.889	1.049	1.156	1.263	1.423	69	0.700	0.861	0.967	1.074	1.234
32	0.888	1.048	1.155	1.261	1.421	70	0.692	0.852	0.959	1.066	1.226
33	0.886	1.046	1.153	1.259	1.420	71	0.684	0.844	0.951	1.058	1.218
34	0.884	1.044	1.151	1.257	1.418	72	0.677	0.837	0.944	1.050	1.210
35	0.882	1.042	1.149	1.255	1.416	73	0.670	0.830	0.937	1.043	1.203
36	0.880	1.040	1.146	1.253	1.413	74	0.663	0.823	0.930	1.037	1.197
37	0.877	1.037	1.144	1.251	1.411	75	0.658	0.818	0.924	1.031	1.191
38	0.875	1.035	1.142	1.248	1.409	76	0.653	0.813	0.919	1.026	1.186
39	0.872	1.032	1.139	1.246	1.406	77	0.649	0.809	0.915	1.022	1.182
40	0.869	1.029	1.136	1.243	1.403	78	0.645	0.806	0.912	1.019	1.179
41	0.866	1.027	1.133	1.240	1.400	79	0.643	0.803	0.910	1.017	1.177
42	0.863	1.023	1.130	1.237	1.397	80	0.641	0.801	0.908	1.015	1.175
43	0.860	1.020	1.127	1.234	1.394						
44	0.857	1.017	1.123	1.230	1.390						

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Appendix

Table A.1

COMPARISON FOR L2-L4 BETWEEN THE DELEZE, CONS ET AL. CLASSIFICATION USING THE MANUFACTURER'S REFERENCE VALUES AND OUR MEXICAN DATABASE USING T-SCORES CALCULATED WITH DATA FOR AGES 20-39, 30-40 OR PBM

Groups according to Deleze, Cons et al.		Count	Groups according to Mexican data base			Total
			Normal	Osteopenia	Osteoporosis	
Normal		1 930	45.1%	3.8%	0.0%	48.9%
	% of total					
Osteopenia		103	31.8%	152		1 616
	% of total					
Osteoporosis		0	86	484		570
	% of total					
Total		2 033	1 610	636		4 279
	% of total					

Table A.2

STATISTICAL ANALYSIS FOR L2-L4

	Percentage		Percentage of differences	Exact probability	Significance of differences
	Deleze Cons et al	Mexican			
Normal	48.9%	47.5%	1.2981	0.0971	Not significant
Osteopenia	37.8%	37.6%	0.1338	0.4468	Not significant
Osteoporosis	13.3%	14.9%	-2.0510	0.0201	Significant

Table A.3

COMPARISON OF CLASSIFICATION OF FEMORAL NECK DENSITY BETWEEN THE DELEZE, CONS ET AL. CLASSIFICATION USING THE MANUFACTURER'S REFERENCE VALUES AND OUR MEXICAN DATABASE USING T-SCORES CALCULATED FOR AGES 20-39, 30-40 OR PBM

Groups according to Deleze Cons et al.		Count	Groups according to Mexican data base			Total
			Normal	Osteopenia	Osteoporosis	Normal
Normal		1 600	36.8%	15.0%	.0%	51.8%
	% of total					
Osteopenia		0	32.8%	326		1 754
	% of total					
Osteoporosis		0	0	343		343
	% of total					
Total		1 600	2 079	669		4 348
	% of total					

Table A.4

STATISTICAL ANALYSIS FOR FEMORAL NECK

Group	Percentage		Percentage of differences	Exact probability	Significance of differences
	Deleze Cons et al	Mexican			
Normal	51.8	36.8	14.1218	0.0000	Significant
Osteopenia	40.3	47.8	-7.0043	0.0000	Significant
Osteoporosis	7.9	15.4	-10.8836	0.0000	Significant