National Health and Nutrition Examination Survey

August 2021-August 2023 Data Documentation, Codebook, and Frequencies

Sex Steroid Hormone Panel - Serum (TST_L)

Data File: TST_L.xpt

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Last Revised: NA

Component Description

The sex steroid hormone panel – Serum (TST) consists of 17α-hydroxyprogesterone, androstenedione, anti-Müllerian hormone, dehydroepiandrosterone sulfate (DHEAS), estradiol, estrone, estrone sulfate, follicle-stimulating hormone, luteinizing hormone, progesterone, sex hormone binding globulin, and total testosterone. This data will allow for analysis of the selected steroid hormones and related binding protein that can be used to assist in disease diagnosis, treatment, and prevention of diseases, such as Polycystic Ovary Syndrome (PCOS), androgen deficiency, certain cancers, and hormone imbalances. An estimated 5 to 7 million women in the United States (U.S.) suffer with the effects of PCOS; and PCOS can occur in girls as young as 11 years old. PCOS is the most common hormonal disorder among women of reproductive age and is the leading cause of infertility. Androgen deficiency, such as hypogonadism, is associated with a range of chronic diseases. The prevalence of symptomatic androgen deficiency in men between 30 and 79 years of age is estimated to be 5.6% (Araujo et. al., 2007). Androgen deficiency in men and excess in women and the associated chronic diseases are a public health concern. Estradiol is the key biomarker for assessing reproductive function in females, including amenorrhea, infertility, and menopausal status. Estradiol levels decline greatly with age, and this decrease is associated with increased risk for cardiovascular disease, cognitive impairment, and bone fractures in older women. Estrogen hormone therapy, or use of estradiol as a supplement, raises health concerns related to estradiol concentration in blood, such as elevated levels in postmenopausal women increasing the risk of breast cancer.

17α-hydroxyprogesterone

17α-hydroxyprogesterone (17-OHP) is a steroid hormone that is primarily produced in the adrenal glands, as well as in the ovaries, testes, and placenta. It is derived from progesterone via 17α-hydroxylase and is a chemical intermediate in the biosynthesis of several other steroids, including cortisol. Measurement of 17-OHP is useful in the diagnosis of congenital adrenal hyperplasia (CAH).

Androstenedione

Androstenedione is a steroid hormone that is produced in the adrenal glands and the gonads. It is a precursor of androgen and estrogen sex hormones, such as testosterone and estrone. Androstenedione is synthesized by the conversion of dehydroepiandrosterone. Elevated androstenedione levels may cause symptoms of hyperandrogenism in females. Measurement of androstenedione is useful in the diagnosis of congenital adrenal hyperplasia, in conjunction with other androgenic precursors, such as 17α-hydroxyprogesterone.

Anti-Müllerian hormone (AMH)

Anti-Müllerian hormone (AMH) or Müllerian-inhibiting substance, is a dimeric glycoprotein secreted by granulosa cells of the preantral and small antral ovarian follicles. AMH levels in the blood can provide information about ovarian function, menopausal status, and can aid in assessments for developmental disorders in children. An increased level of AMH is often seen with PCOS.

Dehydroepiandrosterone sulfate (DHEAS)

DHEAS is produced in the adrenal cortex. It is a conjugated steroid converted by the sulfation of dehydroepiandrosterone (DHEA) at the 3β position via hydroxysteroid sulfotransferase. While DHEAS itself is hormonally inactive, it can be converted to DHEA, which in turn can serve as a precursor to more active steroid hormones, such as testosterone or estradiol. Measurements of DHEAS provides information about the adrenal gland function and can help with the diagnosis of congenital adrenal hyperplasia and PCOS.

Estradiol

Estradiol is produced primarily in the ovary (follicle, corpus luteum), but small quantities are also formed in the testes and in the adrenal cortex, as well as in fat cells. During pregnancy, estradiol is mainly formed in the placenta. About 98% of estradiol is bound to transport proteins (SHBG and albumin). Estradiol secretion has two surges during the menstrual cycle. The determination of estradiol is utilized clinically in the elucidation of fertility disorders in the hypothalamus-pituitary-gonad axis, gynecomastia, estrogen-producing ovarian and testicular tumors and in hyperplasia of the adrenal cortex. Further clinical indications are the monitoring of fertility therapy and determining the time of ovulation within the framework of in vitro fertilization (IVF).

Estrone

Estrone is mainly produced in the gonads through the aromatization of androstenedione but can also be reversibly converted from estradiol via 17β-hydroxysteroid dehydrogenase. Serum estrone is primarily bound to albumin and partially bound to sex hormone-binding globulin (SHBG), with a small portion freely circulating. Measurement of estrone levels by itself or together with estradiol can provide information about potential metabolic disorders, tumors, or developmental disorders, such as early or delayed puberty.

Estrone sulfate

Estrone sulfate is the most abundant circulating estrogen in women and is thought to serve as a long-term reservoir for estrone and estradiol. Thus, estrone sulfate serves as a precursor and intermediate to the major estrogens, estrone and estradiol. It is produced from estrone by estrogen sulfotransferases. While it is mainly biological inactive, it maintains an equilibrium of more active estrogens, such as estrone. Estrone can then be converted to the more reactive estradiol by 17β-hydroxysteroid dehydrogenase. The measurement of estrone sulfate can help with monitoring treatments for certain cancers.

Follicle Simulating Hormone (FSH)

Follicle-stimulating hormone (FSH) is a glycoprotein with two polypeptide units that is produced by the anterior pituitary gland. FSH, often together with luteinizing hormone and/or other hormones, can provide information about ovarian function, as well as help with assessing disease, such as PCOS or disorders of the pituitary or the hypothalamus.

Luteinizing Hormone (LH)

Luteinizing hormone (LH) is a heterodimeric glycoprotein that consists of one alpha and one beta subunit. LH is produced mainly in gonadotropic cells in the anterior pituitary gland. LH often together with follicle stimulating hormone and other steroids, can provide information about ovarian function and can help with assessing disorders of the pituitary and hypothalamus.

Progesterone

Progesterone is a steroid hormone that belongs to the progestogens class of steroid hormones. It is produced in the adrenal glands, corpus luteum, and placenta. Progesterone can be used to track ovulation, monitor the health of a pregnancy, and can help with the diagnosis congenital adrenal hyperplasia.

Sex hormone-binding globulin (SHBG)

Sex hormone-binding globulin (SHBG) is the blood transport protein for androgens and estrogens. SHBG has a high binding affinity to dihydrotestosterone (DHT), medium affinity to testosterone and estradiol, and only a low affinity to estrone, dehydroepiandrosterone (DHEA), androstenedione, and estriol. Its synthesis and secretion are regulated by estrogen (Burger, et. al., 2002; Davis, et. al., 2001). SHBG serum concentrations depend on the extent, duration, and the kind of estrogen applied, and how regulation takes place. In the serum, SHBG mainly takes over the transportation of steroids and the reduction/regulation of the effect of androgen (Rosner, et. al., 1999; Burger, et. al., 2002). Decreased SHBG serum levels are associated with conditions where elevated androgen levels are present or where the effect of androgen on its target organs is excessive. This explains the gender-related differences seen between men and women, especially during puberty.

Measurement of SHBG can be an important indicator of an excessive/chronic androgenic action where androgen levels are normal, but where clinical symptoms would seem to indicate androgen in excess. SHBG is a useful supplementary parameter in the determination of androgen where a relatively high concentration of free androgen (e.g., testosterone) is suspected (Pugeat, et. al., 1996).

Elevated SHBG levels can be seen in elderly men, and are often found in patients with hyperthyroidism, cirrhosis of the liver, and some polymorphisms in the SHBG gene (Bhasin, et. al., 2018). SHBG levels also increase when oral contraceptives, estrogen or antiepileptic drugs are taken. Pregnant women have markedly higher SHBG serum concentrations due to their increased estrogen production. Decreased SHBG concentrations are often seen with hypothyroidism, PCOS, obesity, hirsutism, elevated androgen levels, alopecia, acromegaly, and some polymorphisms in the SHBG gene.

Testosterone

Testosterone is the most important androgenic steroid that has an anabolic effect in humans. It is synthesized in the testes of the male, and in much smaller amounts, in the ovary of the female, and in the adrenal gland of both female and male. In human males, testosterone plays a key role in the development of male reproductive tissues, such as the testis and prostate, as well as promoting secondary sexual characteristics, such as increased muscle and bone mass, and the growth of body hair. The secretion of testosterone is regulated by LH and is subject to negative feedback via the pituitary and hypothalamus. Most of the circulating testosterone is bound to carrier proteins (SHBG and albumin). In women, increased production of testosterone can cause hirsutism and virilization (depending on the increase). The determination of testosterone in the female is helpful in the evaluation of congenital adrenal hyperplasia, PCOS, and when an ovarian tumor, adrenal tumor, adrenal hyperplasia, or ovarian insufficiency is suspected. Testosterone is determined in men when reduced testosterone production is

suspected, e.g., in hypogonadism, estrogen therapy, chromosome aberrations (as in the Klinefelter's syndrome) and liver cirrhosis.

Eligible Sample

All examined participants aged 3 years and older were eligible for 17α-hydroxyprogesterone, androstenedione, dehydroepiandrosterone, estradiol, estrone, estrone sulfate, progesterone, sex hormone binding globulin, and total testosterone.

All examined participants aged 6 years and older were eligible for anti-Müllerian hormone, follicle-stimulating hormone, and luteinizing hormone.

Description of Laboratory Methodology

The following tests for the TST: 17 α-hydroxyprogesterone, androstenedione, DHEAS, estrone, estrone sulfate, estradiol, progesterone, and testosterone are preformed via the isotope dilution liquid chromatography tandem mass spectrometry (ID-LC-MS/MS) method. ID-LC-MS/MS is performed on a triple quadrupole mass spectrometer using electrospray ionization in both positive and negative modes. The analytes are identified based on chromatographic retention time and on specific mass to charge ratio transitions using selected reaction monitoring (SRM). Isotopically labeled internal standards are used for each analyte.

AMH is based on the reaction of AMH with immuno-antibodies and chemi-luminescence measurements of the reaction products after two incubation periods. This assay consists of two incubation steps and a chemiluminescent measurement obtained with a photomultiplier tube.

LH is a test based on the reaction of LH with immuno-antibodies and chemi-luminescence measurements for the reaction products. This assay consists of two incubation steps and a chemiluminescent measurement obtained with a photomultiplier tube.

FSH is a test based on the reaction of FSH with immuno-antibodies and chemi-luminescence measurements for the reaction products. This assay consists of two incubation steps and a chemiluminescent measurement obtained with a photomultiplier tube.

SHBG is based on the reaction of SHBG with immuno-antibodies and chemi-luminescence measurements of the reaction products that occurs after two incubation periods and subjecting to a magnetic field. The microparticles are captured on an electrode, where a chemiluminescent reaction occurs and can be measured by a photomultiplier tube.

Refer to the Laboratory Method Files section for a detailed description of the laboratory methods used.

There were no changes to the lab method, lab equipment, or lab site for this component during the NHANES August 2021—August 2023 cycle.

Laboratory Method Files

Panel of Steroid Hormones (October 2024)

Anti-Müllerian Hormone (October 2024)

Sex Hormone-Binding Globulin (October 2024)

Follicle-Stimulating Hormone (October 2024)

Luteinizing Hormone (October 2024)

Laboratory Quality Assurance and Monitoring

Detailed instructions on specimen collection and processing are discussed in the NHANES Laboratory Procedures Manual (LPM). Vials are stored under appropriate frozen (–30°C) conditions until they are shipped to the National Center for Environmental Health for testing.

The NHANES quality assurance and quality control (QA/QC) protocols meet the 1988 Clinical Laboratory Improvement Amendments mandates. Detailed QA/QC instructions are discussed in the NHANES LPM.

Mobile Examination Centers (MECs)

Laboratory team performance is monitored using several techniques. NCHS and contract consultants use a structured competency assessment evaluation during visits to evaluate both the quality of the laboratory work and the QC procedures. Each laboratory staff member is observed for equipment operation, specimen collection and preparation; testing procedures and constructive feedback are given to each staff member. Formal retraining sessions are conducted annually to ensure that required skill levels were maintained.

Analytical Laboratories

NHANES uses several methods to monitor the quality of the analyses performed by the contract laboratories. In the MEC, these methods include performing blind split samples collected during "dry run" sessions. In addition, contract laboratories randomly perform repeat testing on 2% of all specimens.

NCHS developed and distributed a QC protocol for all the contract laboratories, which outlined the use of Westgard rules (Westgard, et. al., 1981) when testing NHANES specimens. Progress reports containing any problems encountered during shipping or receipt of specimens, summary statistics for each control pool, QC graphs, instrument calibration, reagents, and any special considerations are submitted to NCHS quarterly. The reports are reviewed for trends or shifts in the data. The laboratories are required to explain any identified areas of concern.

All QC procedures recommended by the manufacturers were followed. Reported results for all assays meet the Division of Environmental Health Laboratory Sciences' QA/QC performance criteria for accuracy and precision, similar to the Westgard rules (Caudill, et. al., 2008).

Data Processing and Editing

The data were reviewed. Incomplete data or improbable values were sent to the performing laboratory for confirmation.

Nine derived variables were created in this data file. The variables were created using the following formulas:

LBD17HSI

17α-hydroxyprogesterone in ng/dL (LBX17H) was converted to nmol/L (LBD17HSI) by multiplying by 0.0303.

LBDANDSI

Androstenedione in ng/dL (LBXAND) was converted to nmol/L (LBDANDSI) by multiplying by 0.0349.

LBDAMHSI

Anti-Müllerian hormone in ng/mL (LBXAMH) was converted to pmol/L (LBDAMHSI) by multiplying by 7.14.

LBDDHESI

DHEAS in µg/dL (LBXDHE) was converted to µmol/L (LBDDHESI) by multiplying by 0.0271.

LBDESTSI

Estradiol in pg/mL (LBXEST) was converted to pmol/L (LBDESTSI) by multiplying by 3.67.

LBDESOSI

Estrone in ng/dL (LBXESO) was converted to pmol/L (LBDESOSI) by multiplying by 37.0.

LBDES1SI

Estrone sulfate in pg/mL (LBXES1) was converted to pmol/L (LBDES1SI) by multiplying by 2.73.

LBDPG4SI

Progesterone in ng/dL (LBXPG4) was converted to nmol/L by multiplying by 0.0318.

LBDTSTSI

Total testosterone in ng/dL (LBXTST) was converted to nmol/L (LBDTSTSI) by multiplying by 0.0347.

Analytic Notes

There are over 800 laboratory tests performed on NHANES participants. However, not all participants provided biospecimens or enough volume for all the tests to be performed. The specimen availability can also vary by age or other population characteristics. Analysts should evaluate the extent of missing data in the dataset related to the outcome of interest as well as any predictor variables used in the analyses to determine whether additional re-weighting for item non-response is necessary.

Please refer to the NHANES Analytic Guidelines and the on-line NHANES Tutorial for details on the use of sample weights and other analytic issues.

Phlebotomy Weights

For the August 2021-August 2023 cycle, analysis of nonresponse patterns for the phlebotomy component in the MEC examination revealed differences by age group and race/ethnicity, among other characteristics. For example, approximately 67% of children aged 1-17 years who were examined in the MEC provided a blood specimen through phlebotomy, while 95% of examined adults aged 18 and older provided a blood specimen. Therefore, an additional phlebotomy weight, WTPH2YR, has been included in this data release to address possible nonresponse bias. Participants who are eligible but did not provide a blood specimen have their phlebotomy weight assigned a value of "0" in their records. The phlebotomy weight should be used for analyses that use variables derived from blood analytes, and is included in all relevant data files.

Demographic and Other Related Variables

The analysis of NHANES laboratory data must be conducted using the appropriate survey design and demographic variables. The August 2021—August 2023 Demographics File contains demographic data, health indicators, and other related information collected during household interviews as well as the sample design variables. The recommended procedure for variance estimation requires use of stratum and PSU variables (SDMVSTRA and SDMVPSU, respectively) in the demographic data file.

The Fasting Questionnaire File includes auxiliary information, such as fasting status, the time of venipuncture, and the conditions precluding venipuncture.

This laboratory data file can be linked to the other NHANES data files using the unique survey participant identifier (i.e., SEQN).

Detection Limits

The detection limits were constant for all of the analytes in the data set. Two variables are provided for each of these analytes. The variable named ended "LC" (ex., LBDTSTLC) indicates whether the result was below the limit of detection: the value "0" means that the result was at or above the limit of detection, "1" indicates that the result was below the limit of detection. The other variable prefixed LBX (ex., LBXTST) provides the analytic result for that analyte. For analytes with analytic results below the lower limit of detection (ex., LBDTSTLC=1), an imputed fill value was placed in the analyte results field. This value is the lower limit of detection divided by the square root of 2 (LLOD/sqrt[2]).

The lower limit of detection (LLOD) for steroid hormone panel:

Variable Name	SAS Label	LLOD
LBX17H	17a-hydroxyprogesterone (ng/dL)	0.41
LBXAND	Androstenedione (ng/dL)	0.82
LBXAMH	Anti-Müllerian hormone	0.03*
LBXDHE	Dehydroepiandrosterone sulfate (ug/dL)	0.22
LBXEST	Estradiol (pg/mL)	1.72
LBXESO	Estrone (ng/dL)	0.13
LBXES1	Estrone Sulfate (pg/mL)	2.04
LBXFSH	Follicle Stimulating Hormone (mIU/mL)	0.300
LBXLUH	Luteinizing Hormone (mIU/mL)	0.100
LBXPG4	Progesterone (ng/dL)	0.86
LBXSHBG	SHBG (nmol/L)	0.350
LBDTST	Testosterone, total (ng/dL)	0.57

*Values not reported below the Limit of Quantitation (LLOQ)

References

- Burger H.G., Dudley E.C., Robertson D.M., Dennerstein L. Hormonal changes in the menopause transition. Recent Prog Horm Res. (2002) 57:257-75.
- Caudill S.P., Schleicher R.L., Pirkle J.L., Multi-rule quality control for the age-related eye disease study. Statist. Med. (2008) 27(30):4094-40106.
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- Pugeat M., Crave J.C., Tourniaire J., Forest M.G. Clinical Utility of Sex Hormone-Binding Globulin Measurement. Horm Res (1996) 45:148–155.
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- Westgard J.O., Barry P.L., Hunt M.R., Groth T. A multi-rule Shewhart chart for quality control in clinical chemistry. Clin Chem (1981) 27:493-501.

Codebook and Frequencies

SEQN - Respondent sequence number

Variable Name:	SEQN
SAS Label:	Respondent sequence number
English Text:	Respondent sequence number.
Target:	Both males and females 3 YEARS - 150 YEARS

WTPH2YR - Phlebotomy 2 Year Weight

Variable Name: WTPH2YR

SAS Label: Phlebotomy 2 Year Weight

English Text: Phlebotomy 2 Year Weight

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
4391.8220579 to 253478.77765	Range of Values	7532	7532	
0	No blood sample provided	961	8493	
.	Missing	0	8493	

LBX17H - 17α-hydroxyprogesterone (ng/dL)

Variable Name: LBX17H

SAS Label: 17α-hydroxyprogesterone (ng/dL)

English Text: 17α-hydroxyprogesterone (ng/dL)

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.29 to 1840	Range of Values	7120	7120	
.	Missing	1373	8493	

LBD17HSI - 17α-hydroxyprogesterone (nmol/L)

Variable Name: LBD17HSI

SAS Label: 17α-hydroxyprogesterone (nmol/L)

English Text: 17α-hydroxyprogesterone (nmol/L)

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.00879 to 55.8	Range of Values	7120	7120	
.	Missing	1373	8493	

LBD17HLC - 17α-hydroxyprogesterone Comment Code

Variable Name: LBD17HLC

SAS Label: 17α-hydroxyprogesterone Comment Code

English Text: 17α-hydroxyprogesterone Comment Code

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	7112	7112	
1	Below lower detection limit	8	7120	
.	Missing	1373	8493	

LBXAND - Androstenedione (ng/dL)

Variable Name: LBXAND

SAS Label: Androstenedione (ng/dL)

English Text: Androstenedione (ng/dL)

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.58 to 755	Range of Values	7190	7190	
.	Missing	1303	8493	

LBDANDSI - Androstenedione (nmol/L)

Variable Name: LBDANDSI

SAS Label: Androstenedione (nmol/L)

English Text: Androstenedione (nmol/L)

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.0202 to 26.3	Range of Values	7190	7190	
.	Missing	1303	8493	

LBDANDLC - Androstenedione Comment Code

Variable Name: LBDANDLC

SAS Label: Androstenedione Comment Code

English Text: Androstenedione Comment Code

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	7186	7186	
1	Below lower detection limit	4	7190	
.	Missing	1303	8493	

LBXAMH - Anti-Mullerian hormone (ng/mL)

Variable Name: LBXAMH

SAS Label: Anti-Mullerian hormone (ng/mL)

English Text: Anti-Mullerian hormone (ng/mL)

Target: Both males and females 6 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.02 to 45.92	Range of Values	6823	6823	
.	Missing	1670	8493	

LBDAMHSI - Anti-Mullerian hormone (pmol/L)

Variable Name: LBDAMHSI

SAS Label: Anti-Mullerian hormone (pmol/L)

English Text: Anti-Mullerian hormone (pmol/L)

Target: Both males and females 6 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.14 to 327.87	Range of Values	6823	6823	
.	Missing	1670	8493	

LBDAMHLC - Anti-Mullerian hormone Comment Code

Variable Name: LBDAMHLC

SAS Label: Anti-Mullerian hormone Comment Code

English Text: Anti-Mullerian hormone Comment Code

Target: Both males and females 6 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	4902	4902	
1	Below lower detection limit	1921	6823	
.	Missing	1670	8493	

LBXDHE - DHEAS (µg/dL)

Variable Name: LBXDHE

SAS Label: DHEAS (µg/dL)

English Text: Dehydroepiandrosterone sulfate (µg/dL)

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.156 to 601	Range of Values	7065	7065	
.	Missing	1428	8493	

LBDDHESI - DHEAS (µmol/L)

Variable Name: LBDDHESI

SAS Label: DHEAS (µmol/L)

English Text: Dehydroepiandrosterone sulfate (µmol/L)

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.00423 to 16.3	Range of Values	7065	7065	
.	Missing	1428	8493	

LBDDHELC - DHEAS Comment Code

Variable Name: LBDDHELC

SAS Label: DHEAS Comment Code

English Text: Dehydroepiandrosterone sulfate Comment Code

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	7057	7057	
1	Below lower detection limit	8	7065	
.	Missing	1428	8493	

LBXEST - Estradiol (pg/mL)

Variable Name: LBXEST

SAS Label: Estradiol (pg/mL)

English Text: Estradiol (pg/mL)

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
1.22 to 13200	Range of Values	7148	7148	
.	Missing	1345	8493	

LBDESTSI - Estradiol (pmol/L)

Variable Name: LBDESTSI

SAS Label: Estradiol (pmol/L)

English Text: Estradiol (pmol/L)

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
4.48 to 48400	Range of Values	7148	7148	
.	Missing	1345	8493	

LBDESTLC - Estradiol Comment Code

Variable Name: LBDESTLC

SAS Label: Estradiol Comment Code

English Text: Estradiol Comment Code

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	6450	6450	
1	Below lower detection limit	698	7148	
.	Missing	1345	8493	

LBXESO - Estrone (ng/dL)

Variable Name: LBXESO

SAS Label: Estrone (ng/dL)

English Text: Estrone (ng/dL)

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.0919 to 510	Range of Values	7159	7159	
.	Missing	1334	8493	

LBDESOSI - Estrone (pmol/L)

Variable Name: LBDESOSI

SAS Label: Estrone (pmol/L)

English Text: Estrone (pmol/L)

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
3.4 to 18900	Range of Values	7159	7159	
.	Missing	1334	8493	

LBDESOLC - Estrone Comment Code

Variable Name: LBDESOLC

SAS Label: Estrone Comment Code

English Text: Estrone Comment Code

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	6993	6993	
1	Below lower detection limit	166	7159	
.	Missing	1334	8493	

LBXES1 - Estrone Sulfate (pg/mL)

Variable Name: LBXES1

SAS Label: Estrone Sulfate (pg/mL)

English Text: Estrone Sulfate (pg/mL)

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
1.44 to 25400	Range of Values	7013	7013	
.	Missing	1480	8493	

LBDES1SI - Estrone Sulfate (pmol/L)

Variable Name: LBDES1SI

SAS Label: Estrone Sulfate (pmol/L)

English Text: Estrone Sulfate (pmol/L)

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
3.93 to 69300	Range of Values	7013	7013	
.	Missing	1480	8493	

LBDES1LC - Estrone Sulfate Comment Code

Variable Name: LBDES1LC

SAS Label: Estrone Sulfate Comment Code

English Text: Estrone Sulfate Comment Code

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	6966	6966	
1	Below lower detection limit	47	7013	
.	Missing	1480	8493	

LBXFSH - Follicle Stimulating Hormone (mIU/mL)

Variable Name: LBXFSH

SAS Label: Follicle Stimulating Hormone (mIU/mL)

English Text: Follicle Stimulating Hormone (mIU/mL)

Target: Both males and females 6 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.21 to 194.7	Range of Values	7014	7014	
.	Missing	1479	8493	

LBDFSHLC - FSH Comment Code

Variable Name: LBDFSHLC

SAS Label: FSH Comment Code

English Text: Follicle Stimulating Hormone Comment Code

Target: Both males and females 6 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	6919	6919	
1	Below lower detection limit	95	7014	
.	Missing	1479	8493	

LBXLUH - Luteinizing Hormone (mIU/mL)

Variable Name: LBXLUH

SAS Label: Luteinizing Hormone (mIU/mL)

English Text: Luteinizing Hormone (mIU/mL)

Target: Both males and females 6 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.07 to 116.2	Range of Values	7014	7014	
.	Missing	1479	8493	

LBDLUHLC - Luteinizing Hormone Comment Code

Variable Name: LBDLUHLC

SAS Label: Luteinizing Hormone Comment Code

English Text: Luteinizing Hormone Comment Code

Target: Both males and females 6 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	6624	6624	
1	Below lower detection limit	390	7014	
.	Missing	1479	8493	

LBXPG4 - Progesterone (ng/dL)

Variable Name: LBXPG4

SAS Label: Progesterone (ng/dL)

English Text: Progesterone (ng/dL)

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.608 to 12800	Range of Values	7136	7136	
.	Missing	1357	8493	

LBDPG4SI - Progesterone (nmol/L)

Variable Name: LBDPG4SI

SAS Label: Progesterone (nmol/L)

English Text: Progesterone (nmol/L)

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.0193 to 407	Range of Values	7136	7136	
.	Missing	1357	8493	

LBDPG4LC - Progesterone Comment Code

Variable Name: LBDPG4LC

SAS Label: Progesterone Comment Code

English Text: Progesterone Comment Code

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	6701	6701	
1	Below lower detection limit	435	7136	
.	Missing	1357	8493	

LBXSHBG - SHBG (nmol/L)

Variable Name: LBXSHBG

SAS Label: SHBG (nmol/L)

English Text: Sex Hormone Binding Globulin (SHBG, nmol/L)

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
1.18 to 671.9	Range of Values	7191	7191	
.	Missing	1302	8493	

LBDSHGLC - SHBG Comment Code

Variable Name: LBDSHGLC

SAS Label: SHBG Comment Code

English Text: Sex Hormone Binding Globulin Comment Code

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	7191	7191	
1	Below lower detection limit	0	7191	
.	Missing	1302	8493	

LBXTST - Testosterone, total (ng/dL)

Variable Name: LBXTST

SAS Label: Testosterone, total (ng/dL)

English Text: Testosterone, total (ng/dL)

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.403 to 5180	Range of Values	7160	7160	
.	Missing	1333	8493	

LBDTSTSI - Testosterone, total (nmol/L)

Variable Name: LBDTSTSI

SAS Label: Testosterone, total (nmol/L)

English Text: Testosterone, total (nmol/L)

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.014 to 180	Range of Values	7160	7160	
.	Missing	1333	8493	

LBDTSTLC - Testosterone comment code

Variable Name: LBDTSTLC

SAS Label: Testosterone comment code

English Text: Testosterone comment code

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	7062	7062	
1	Below lower detection limit	98	7160	
.	Missing	1333	8493	