



Technical Report

ISO/TR 7250-2

Basic human body measurements for technological design —

Part 2: Statistical summaries of body measurements from national populations

*Définitions des mesures de base du corps humain pour la
conception technologique —*

*Partie 2: Résumés statistiques des mesurages du corps de
populations nationales*

**Second edition
2024-03**

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Published in Switzerland

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 159, *Ergonomics*, Subcommittee SC 3, *Anthropometry and biomechanics*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 122, *Ergonomics*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO/TR 7250-2:2010), which has been technically revised. It also incorporates the Amendment ISO/TR 7250-2:2010/Amd 1:2013.

The main changes are as follows:

- measurement item numbers have been updated to harmonize with ISO 7250-1;
- statistics for the male and female combined data have been deleted;
- data from the Republic of Korea have been updated;
- new data from Sweden and Brazil have been added;
- scan-derived data not evaluated for comparability with traditional manual measurements from Canada have been included in Annex B (informative).

A list of all parts in the ISO 7250 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Anthropometric data used for technological design have been included in many ISO product standards. However, different review cycles make it impossible for simultaneous revision of these product standards as new anthropometric data become available. This document is intended to serve as a continually updated repository of the most current national anthropometric data. It is intended to make current and updated anthropometric data available for inclusion by reference in the various ISO product standards requiring ISO 7250-1 body measurement input, wherever national specificity of design parameters is required.

Body dimensions of people have been increasing in many countries over the past few decades. The rate of increase differs from country to country. In areas experiencing significant secular change, the statistical summaries described in this document will become outdated sooner. Therefore, it is intended that statistical summaries of human body measurements described in this document be updated as new data become available.

This document provides body dimensions data for people of "working age". In order to provide practical data, the working age population is not defined and the decision is left to each country, because working age differs between countries. However, data for children under 16 years are not included.

To ensure the comparability of measurements, body dimensions in this document are measured according to ISO 7250-1. To ensure the reliability of statistical data, databases from which statistics are calculated adhere to ISO 15535:2012 and ISO 15535:2023.

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Basic human body measurements for technological design —

Part 2: Statistical summaries of body measurements from national populations

1 Scope

This document provides statistical summaries of body measurements measured according to ISO 7250-1, together with database background information for working age people prepared according to ISO 15535:2012 in the national populations of individual ISO member bodies. This document also describes the process of the measurement and preparation of statistical summaries.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

secular change

change in mean body dimensions of a specific group over time

Note 1 to entry: The direction of change can be positive or negative.

4 Anthropometric measurements

Measuring conditions and definitions of measurements in this document are the same as those described in ISO 7250-1. Body measurements are described in millimetres (mm) or kilograms (kg).

Body measurements obtained from 3D systems or obtained using instruments different from those described in ISO 7250-1 are confirmed by member bodies to be sufficiently close to those produced by the traditional methods of ISO 7250-1 according to ISO 20685-1:2018, Clause 5. [Annex B](#) provides further information on scan-derived databases.

Sometimes a measurement is not performed exactly as described in ISO 7250-1, but is very similar. In such cases, the measurement may be substituted for the ISO 7250-1 measurement if its value is adequately close. To judge closeness, the method described in ISO 20685-1 is used. The criteria for the judgment are given in [Annex A](#).

The measured side (right or left) is described.

When measurements not described in ISO 7250-1 are also available, the number of these measurements and the reference are provided.

Age statistics are tabulated similarly and presented together with the anthropometric measurements.

5 Statistical procedures

5.1 Data editing

Before calculating statistical values, irregular values are detected and reviewed according to ISO 15535:2012, Annex F or ISO 15535:2023, Annex F.

5.2 Statistics

In this document, the following statistics are described for each measurement: sample size, mean, standard deviation (SD) and 1st, 5th, 50th, 95th and 99th percentile values.

5.3 Population stratification

Population can be stratified by gender, age, location, occupation or education. To keep this document at a reasonable size, statistics are presented for females and males, but not for other strata.

5.4 Age stratification

In order to provide practical data and to keep this document at a reasonable size, only one age group, including all working-age people, is considered.

5.5 Body measurements for representative body forms

Measurements for body forms representing large, medium and small types are useful for technological design. While the medium type can be represented by P50 values for all measurements, fixed percentile options are problematic for extreme body forms, such as those derived from all P5 or P95 values. When sitting height and leg length are P5, height is smaller than P5. Though such a problem is well recognized, there is no consensus on the method for obtaining measurements for body forms statistically representing the variation in a population. Considering this lack of consensus, such data is not presented in this document.

6 Background information

6.1 General

Statistics of body dimensions are described together with the following information for users to judge their reliability and context.

6.2 Background of database

6.2.1 Time period of measurement

Year(s) of measurement.

6.2.2 Location of measurement

Name of the country and city.

6.2.3 Demographic data

For demographic data (e.g. gender, age), information on the following items is provided:

- a) definition of the working age;
- b) description of participants;
- c) number of participants by gender;
- d) 10-year age groups.

When more than one subgroup based on criteria other than the age and gender is involved, the percentage of each subgroup is provided, if necessary.

6.2.4 Publication on the anthropometric research

The author, publication year, title of the publication and the name of publisher are provided when the data have been published.

6.3 Representativeness of the sample

6.3.1 Sampling method

A description is given of the grounds on which the sample was judged to be representative of the intended population. These include a measurement of the sampling method and can also include the comparison of height and weight in the measured sample data with those from a large sample representing the intended population. If the data need to be weighted in order to be representative, then the weighting method is described.

6.3.2 Information on secular change

When significant secular changes are occurring, information on the rate of change over the past few decades is presented when available, and appropriate references are given.

6.4 Accuracy and reliability of measurements

6.4.1 Skill of measurers

The number of measurers and information on the skill of each measurer, such as intra-observer mean absolute difference or technical error of measurement (TEM) or repeated measurements, are shown when such data are available. When more than one measurer is involved, the methods used to control the quality of the measurement technique are documented. When the research is continued for more than one month, the method of quality control during the research period is documented.

6.4.2 Measurements from 3D scanners

When measurements are extracted from 3D scans, the results are compared to measurements obtained by traditional methods using the procedures in ISO 20685-1:2018, Clause 5. Similarly, measurements taken using instruments not described in ISO 7250-1 are compared to those obtained by traditional methods.

7 Procedure for presenting member body statistics

7.1 General

This clause describes how the statistics given in this document are gathered and checked.

7.2 Submission of data

Users of this document and ISO member bodies are encouraged to submit anthropometric data for this document. Users with knowledge of additional anthropometric data can contribute by contacting their ISO member body. When information is received, it is processed as described in this clause.

7.3 One data set from each member body

In the case of countries with more than one possible database, the member body determines which of the databases is to be used. If more than one set of statistics is submitted, the member body will be asked to choose only one data set.

7.4 Meeting the criteria outlined in [5.2](#), [5.3](#) and [5.4](#)

Member bodies will provide summary statistics that meet the criteria outlined in [5.2](#), [5.3](#) and [5.4](#). If the criteria are not met on the first submission, the member body will be asked to resubmit the statistics according to the criteria.

7.5 Measurement of possible errors

7.5.1 General

Recognizing that errors can accidentally occur in any data set, the submitted summary statistics are measured for reasonableness. The steps used are those in [7.5.2](#) to [7.5.5](#).

7.5.2 Minima and maxima

The minima and maxima for each dimension are measured, comparing them to minima and maxima from other member body submissions. If minima or maxima are likely to be the result of errors, the member body will be contacted to verify the submission.

7.5.3 Percentile values

The distance of the P1 and P99, P5 and P95 from the P50 percentile value are measured. If the distant percentiles are unusually distant from the P50, the member body will be contacted to verify the submission.

7.5.4 Standard deviation (SD)

The SD is compared to the SD submitted by other member bodies. If the SD is unusually large or unusually small, the member body will be contacted to verify the submission.

7.5.5 Comparison of mean or P50 values from member bodies

The mean or P50 values are measured with respect to mean or P50 values from other member bodies to make sure that the dimension being reported is that described in ISO 7250-1. If it appears that a different measuring technique, or different measurement definition, has been used, the member body will be contacted to verify the measurement procedure.

7.6 Marks on values likely to be in error

If resubmitted summary statistics are still likely to be in error, the published values are marked with a footnote.

8 Statistics for ISO national members

8.1 General

Background information and a statistical summary from each member body are presented in separate tables in this clause.

- Data from Germany are in [Table 1](#) and [Table 2](#).
- Data from Italy are in [Table 3](#) and [Table 4](#).
- Data from Japan are in [Table 5](#) and [Table 6](#).
- Data from Kenya are in [Table 7](#) and [Table 8](#).
- Data from the Republic of Korea are in [Table 9](#) and [Table 10](#).
- Data from the Netherlands are in [Table 11](#) and [Table 12](#).
- Data from Thailand are in [Table 13](#) and [Table 14](#).
- Data from the United States of America are in [Table 15](#) and [Table 16](#).
- Data from China are in [Table 17](#) and [Table 18](#).
- Data from India are in [Table 19](#) and [Table 20](#).
- Data from Sweden are in [Table 21](#) and [Table 22](#).
- Data from Brazil are in [Table 23](#) and [Table 24](#).

8.2 Austria

Organization: Austrian Standards Institute

Name of study: —

Austria adopts anthropometric data from DIN 33402-2.

8.3 Germany

Organization: Deutsches Institut für Normung - German Standardization Institute (DIN)

Name of study: —

Table 1 — Germany: Database

1 Measurement		
1.1	Measured side (right/left)	Right
1.2	Measurement definitions different from those described in ISO 7250-1	None
1.3	Substituted measurements	
1.4	Number of measurements not described in ISO 7250-1	
2 Age range		

Table 1 (continued)

2.1	Working age	18 to 65
2.2	Age range of participants	18 to 65
3 Background data		
3.1	Time period of measurement	1999 to 2002
3.2	Location of measurement	Different areas of Germany
3.3	Survey sample	Representative (regional, social, ethnic)
3.4	Publication	DIN 33402-2
4 Representativeness of the sample		
4.1	Sampling method	
4.2	Information on secular change	The secular trend in Germany has stopped.
5 Accuracy and reliability of measurements		
5.1	Intra- and inter-observer error rates	Exist
5.2	Measurements from 3D scanners	None
5.3	Other measurement not taken using instruments described in ISO 7250-1	None
5.4	Type of clothing	Without shoes, minimal clothing

Table 2 — Germany: Statistical summary

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
		Age	Male								
			Female								
1	6.1.1	Body mass (weight), kg	Male				64	79	100		
			Female				52	66	87		
2	6.1.2	Stature (body height)	Male				1 650	1 750	1 855		
			Female				1 535	1 625	1 720		
3	6.1.3	Eye height	Male				1 530	1 630	1 735		
			Female				1 430	1 515	1 605		
4	6.1.4	Shoulder height	Male				1 345	1 450	1 550		
			Female				1 260	1 345	1 425		
5	6.1.5	Elbow height	Male				1 025	1 100	1 175		
			Female				960	1 020	1 080		
6	6.1.6	Iliac spine height, standing	Male								
			Female								
7	6.1.7	Crotch height	Male				760	830	905		
			Female				710	775	830		
8	6.1.8	Tibial height	Male				430	460	480		
			Female				400	425	450		

Table 2 (continued)

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
9	6.1.9	Chest depth, standing	Male					195	225	270	
			Female					165	190	235	
10	6.1.10	Body depth, standing	Male					260	285	380	
			Female					245	290	345	
11	6.1.11	Chest breadth, standing	Male								
			Female								
12	6.1.12	Hip breadth, standing	Male					340	360	385	
			Female					340	365	400	
13	6.2.1	Sitting height (erect)	Male					855	910	965	
			Female					810	860	910	
14	6.2.2	Eye height, sitting	Male					740	795	855	
			Female					705	755	805	
15	6.2.3	Cervical height, sitting	Male								
			Female								
16	6.2.4	Shoulder height, sitting	Male					570	625	670	
			Female					540	590	630	
17	6.2.5	Elbow height, sitting	Male					210	240	285	
			Female					185	230	275	
18	6.2.6	Shoulder-elbow length	Male					330	365	400	
			Female					290	320	350	
19	6.2.7	Shoulder (biacromial) breadth	Male					370	405	435	
			Female					345	370	400	
20	6.2.8	Shoulder (bidel-toid) breadth	Male					440	480	525	
			Female					395	435	485	
21	6.2.9	Elbow-to-elbow breadth	Male					415	480	555	
			Female					395	485	555	
22	6.2.10	Hip breadth, sitting	Male					350	375	420	
			Female					360	390	460	
23	6.2.11	Popliteal height, sitting	Male					410	450	490	
			Female					375	415	450	
24	6.2.12	Thigh clearance	Male					130	150	180	
			Female					125	145	175	
25	6.2.13	Knee height, sitting	Male					495	535	585	
			Female					460	500	545	
26	6.2.14	Abdominal depth, sitting	Male					200	280	330	
			Female					205	250	325	
27	6.2.15	Thorax depth	Male								
			Female								
28	6.2.16	Buttock-abdomen depth, sitting	Male								
			Female								
29	6.3.1	Hand length (stylion)	Male					175	189	207	
			Female					162	177	193	

Table 2 (continued)

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
30	6.3.2	Palm length	Male					104	111	121	
			Female					92	100	108	
31	6.3.3	Hand breadth at metacarpals	Male					80	87	94	
			Female								
32	6.3.4	Index finger length	Male					68	75	83	
			Female					62	69	77	
33	6.3.5	Index finger breadth, proximal	Male					19	21	23	
			Female					17	19	21	
34	6.3.6	Index finger breadth, distal	Male					17	18	20	
			Female					14	16	18	
35	6.3.7	Foot length	Male					245	265	285	
			Female					225	245	260	
36	6.3.8	Foot breadth	Male					92	101	111	
			Female					83	92	102	
37	6.3.9	Head length	Male					185	195	205	
			Female					170	185	195	
38	6.3.10	Head breadth	Male					145	155	165	
			Female					140	150	160	
39	6.3.11	Face length (menton-sellion)	Male					105	115	130	
			Female					95	110	125	
40	6.3.12	Head circumference	Male					545	570	600	
			Female					520	545	570	
41	6.3.13	Sagittal arc	Male					330	350	375	
			Female					310	330	360	
42	6.3.14	Bitragion arc	Male					340	365	385	
			Female					320	335	360	
43	6.3.15	Thumb length	Male								
			Female								
44	6.3.16	Thumb breadth	Male								
			Female								
45	6.3.17	Hand thickness	Male								
			Female								
46	6.3.18	Hand breadth, including thumb	Male								
			Female								
47	6.3.19	Arm circumference flexed	Male								
			Female								
48	6.3.20	Forearm circumference flexed	Male								
			Female								
49	6.4.1	Wall-acromion distance	Male								
			Female								
50	6.4.2	Grip reach; forward reach	Male					685	740	815	
			Female					625	690	750	

Table 2 (continued)

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
51	6.4.3	Elbow-wrist length	Male								
			Female								
52	6.4.4	Elbow-grip length	Male					325	350	390	
			Female					295	315	350	
53	6.4.5	Fist (grip axis) height	Male					730	765	825	
			Female					670	715	760	
54	6.4.6	Forearm-fingertip length	Male					440	475	510	
			Female					400	430	465	
55	6.4.7	Buttock-popliteal length (seat depth)	Male					450	495	540	
			Female					435	485	530	
56	6.4.8	Buttock-knee length	Male					565	610	655	
			Female					545	590	640	
57	6.4.9	Neck circumference	Male					335	380	410	
			Female					305	345	385	
58	6.4.10	Chest circumference	Male					870	975	1 110	
			Female					850	990	1 180	
59	6.4.11	Waist circumference	Male					700	875	1 010	
			Female					665	790	990	
60	6.4.12	Wrist circumference	Male					160	175	190	
			Female					150	165	180	
61	6.4.13	Thigh circumference	Male					490	570	640	
			Female					485	565	670	
62	6.4.14	Calf circumference	Male					325	375	415	
			Female					325	360	415	

8.4 Italy

Organization: Ente Nazionale Italiano di Unificazione (UNI)

Name of study: "Italia si misura" project

Table 3 — Italy: Database

1 Measurement		
1.1	Measured side (right/left)	Right
1.2	Measurement definitions different from those described in ISO 7250-1	None

Table 3 (continued)

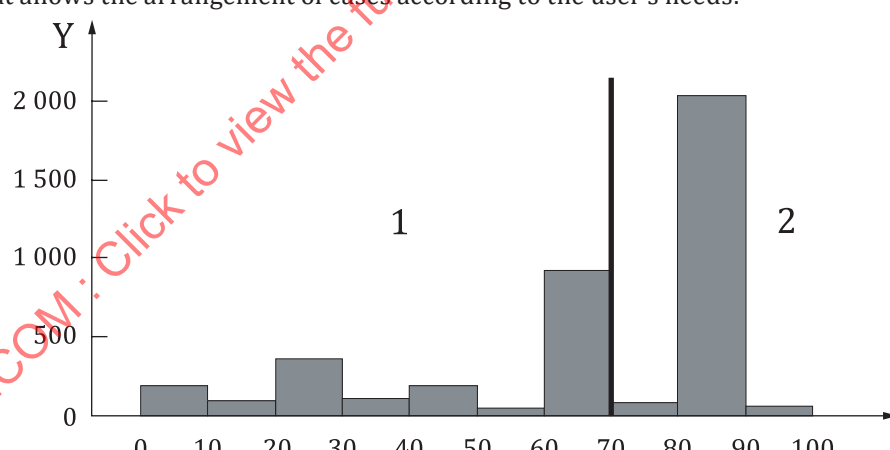
1.3	Substituted measurements	6.1.7 crotch height: obtained from the difference of stature less sitting height (6.1.2 – 6.2.1). 6.2.3 cervical height, sitting and 6.2.4 shoulder height, sitting as the difference of stature less cervical height, standing and stature less shoulder height, standing from sitting height: 6.2.3 = [6.2.1 – (6.1.2 – cervical height, standing)] and 6.2.4 = [6.2.1 – (6.1.2 – shoulder height standing)].
1.4	Number of measurements not described in ISO 7250-1	Five measurements: Cervical height, standing (see Reference [2], no. 11), cristall height (see Reference [3], Altezza Crista iliaca), bi-cristall breadth, shoulder height, standing (see References [2] and [3]), styloid height, standing, (see References [2] and [3]).
2 Age range		
2.1	Working age	Age 17 to 84: the full sample ($n = 4\,135$)
2.2	Age range of participants	Age 18 to 65: the sample used for this statistical presentation ($n = 4\,020$)
3 Background data		
3.1	Time period of measurement	1990 to 1991, July to September
3.2	Location of measurement	Province of Ancona (postcode 60 100) littoral from Senigallia to Numana (1990): mainly centre-north Italian population; province of Naples (postcode 80 100) littoral from Pozzuoli to Sorrento (1991): mainly south Italian population. Independent of measurement location, participants' origins are identified by their birth location, first two digits of Italian post office postcode: centre-north < 70 south > 70. Postcode is a geographical (west < east, north < south, 00 Rome) and numerical variable that allows the arrangement of cases according to the user's needs.  Y frequency 1 centre-north 2 south
3.3	Survey sample	Approximately 2 300 males and 1 850 females (the correct number is reported for each variable) distributed in almost equivalent centre-north Italy (Ancona) and south Italy (Naples) locations. The subdivision of centre-north and south population is based on ISTAT (Italian Statistical Body) military recruitment standards. The participants are common volunteer adult people present on the survey site (beach). The choice of seashore in holiday time was to approach a reasonably non-specific population sample to incidentally measure people that had time to spend and no difficulty concerning clothing, making no selection of the volunteers. The choice of the site avoided socially selected locations.
3.4	Publication	Reference [4] Reference [5] Reference [6] Reference [7]

Table 3 (continued)

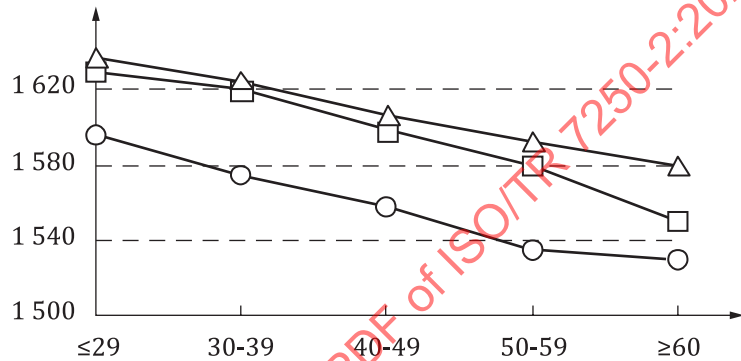
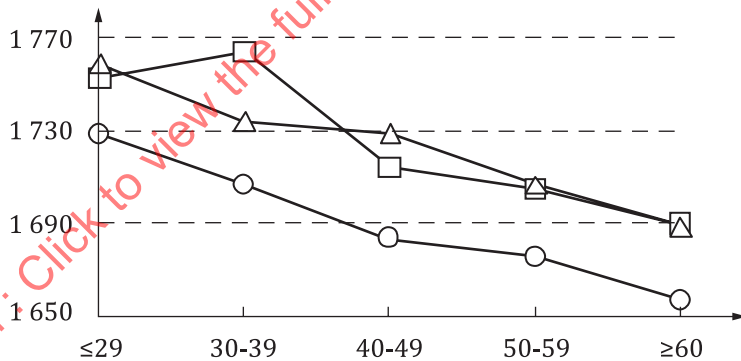
4 Representativeness of the sample																																																		
4.1	Sampling method	The age and gender frequencies reflect the proportions of the people at the beach and their willingness to collaborate. This can initially appear to present a serious restriction of the sample. However, the distribution resembles a section of the natural distribution of the population by age (the "Lexis curve"), and consequently, the bias is not expected to be critical, considering the primary object of the research. To balance the sample by gender, the samples are weighted equally (weight coefficients: 0,898 males and 1,129 females), keeping the total number equal to the original sample 4 020 ± 1.																																																
4.2	Information on secular change	Sample shows an inner tendency of change that combines “secular trend” and “ageing”. Female stature by age classes <table><caption>Estimated data for Female stature by age classes (cm)</caption><thead><tr><th>Age Class</th><th>North (△)</th><th>Centre (□)</th><th>South (○)</th></tr></thead><tbody><tr><td>≤29</td><td>1625</td><td>1620</td><td>1590</td></tr><tr><td>30-39</td><td>1615</td><td>1610</td><td>1575</td></tr><tr><td>40-49</td><td>1605</td><td>1595</td><td>1565</td></tr><tr><td>50-59</td><td>1595</td><td>1585</td><td>1555</td></tr><tr><td>≥60</td><td>1585</td><td>1575</td><td>1550</td></tr></tbody></table> Male stature by age classes <table><caption>Estimated data for Male stature by age classes (cm)</caption><thead><tr><th>Age Class</th><th>North (△)</th><th>Centre (□)</th><th>South (○)</th></tr></thead><tbody><tr><td>≤29</td><td>1765</td><td>1760</td><td>1730</td></tr><tr><td>30-39</td><td>1760</td><td>1765</td><td>1720</td></tr><tr><td>40-49</td><td>1730</td><td>1725</td><td>1695</td></tr><tr><td>50-59</td><td>1715</td><td>1710</td><td>1690</td></tr><tr><td>≥60</td><td>1695</td><td>1690</td><td>1665</td></tr></tbody></table> △ north □ centre ○ south	Age Class	North (△)	Centre (□)	South (○)	≤29	1625	1620	1590	30-39	1615	1610	1575	40-49	1605	1595	1565	50-59	1595	1585	1555	≥60	1585	1575	1550	Age Class	North (△)	Centre (□)	South (○)	≤29	1765	1760	1730	30-39	1760	1765	1720	40-49	1730	1725	1695	50-59	1715	1710	1690	≥60	1695	1690	1665
Age Class	North (△)	Centre (□)	South (○)																																															
≤29	1625	1620	1590																																															
30-39	1615	1610	1575																																															
40-49	1605	1595	1565																																															
50-59	1595	1585	1555																																															
≥60	1585	1575	1550																																															
Age Class	North (△)	Centre (□)	South (○)																																															
≤29	1765	1760	1730																																															
30-39	1760	1765	1720																																															
40-49	1730	1725	1695																																															
50-59	1715	1710	1690																																															
≥60	1695	1690	1665																																															
5 Accuracy and reliability of measurements																																																		
5.1	Intra- and inter-observer error rates	The survey was carried out by a team of four (two male and two female) operators: physical education graduates (Ancona) and Doctor of Medicine graduate students (Naples), supervised by an expert anthropometrist and certified ergonomist. No specific intra- and inter-observer measurement of error rates were performed. Original forms consent to identify operators. All measurements and statistics are taken and rounded in units of millimetres and kilograms.																																																
5.2	Measurements from 3D scanners	None																																																
5.3	Other measurement not taken using instruments described in ISO 7250-1	None																																																
5.4	Type of clothing	Participants' own bathing suits.																																																

Table 4 — Italy: Statistical summary

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
		Age	Male	2 011	38	13	19	20	37	60	64
			Female	2 011	36	13	19	19	35	59	64
1	6.1.1	Body mass (weight), kg	Male	1 974	76	10	54	60	75	93	103
			Female	1 980	60	9	43	48	59	78	88
2	6.1.2	Stature (body height)	Male	2 011	1 716	69	1 563	1 601	1 714	1 834	1 883
			Female	2 011	1 592	64	1 443	1 490	1 590	1 695	1 757
3	6.1.3	Eye height	Male								
			Female								
4	6.1.4	Shoulder height	Male	1 919	1 410	56	1 303	1 323	1 405	1 508	1 553
			Female	1 990	1 303	58	1 166	1 210	1 302	1 394	1 448
5	6.1.5	Elbow height	Male	2 002	1 084	51	967	1 004	1 082	1 170	1 205
			Female	1 995	1 001	48	888	925	1 000	1 078	1 114
6	6.1.6	Iliac spine height, standing	Male								
			Female								
7 ^a	6.1.7	Crotch height	Male	1 967	836	47	732	760	834	914	945
			Female	2 001	757	42	655	689	756	827	864
8	6.1.8	Tibial height	Male	1 991	457	31	397	411	454	511	538
			Female	1 970	432	28	373	386	431	480	497
9	6.1.9	Chest depth, standing	Male	2 006	215	23	166	180	214	255	277
			Female	2 004	188	27	138	152	185	235	271
10	6.1.10	Body depth, standing	Male								
			Female								
11	6.1.11	Chest breadth, standing	Male								
			Female								
12	6.1.12	Hip breadth, standing	Male								
			Female								
13	6.2.1	Sitting height (erect)	Male	1 986	883	38	804	820	882	946	976
			Female	2 005	835	37	747	775	835	894	918
14	6.2.2	Eye height, sitting	Male								
			Female								
15 ^a	6.2.3	Cervical height, sitting	Male	1 976	643	35	563	586	642	702	730
			Female	1 970	604	33	529	550	604	659	685
16 ^a	6.2.4	Shoulder height, sitting	Male	1 893	573	34	501	520	571	631	660
			Female	1 924	550	34	484	501	549	602	629
17	6.2.5	Elbow height, sitting	Male	2 000	238	32	164	186	237	291	314
			Female	1 988	238	28	170	190	238	283	303
18	6.2.6	Shoulder-elbow length	Male	1 950	322	22	277	288	322	357	381
			Female	1 922	303	22	259	270	302	339	360
19	6.2.7	Shoulder (biacromial) breadth	Male	2 005	392	27	325	344	395	435	450
			Female	1 981	345	21	291	308	345	379	390
20	6.2.8	Shoulder (bidel-toid) breadth	Male	2 001	460	26	404	421	459	500	519
			Female	1 988	409	27	353	368	406	459	479

Table 4 (continued)

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
21	6.2.9	Elbow-to-elbow breadth	Male	2 006	498	45	379	420	499	571	594
			Female	1 998	443	46	338	372	442	525	570
22	6.2.10	Hip breadth, sitting	Male	1 989	350	28	285	305	343	397	431
			Female	1 995	359	33	292	312	355	417	465
23	6.2.11	Popliteal height, sitting	Male	1 994	461	30	399	412	460	511	536
			Female	1 999	413	34	342	362	411	472	496
24	6.2.12	Thigh clearance	Male	2 003	138	14	104	116	138	160	172
			Female	1 998	134	16	101	110	134	159	171
25	6.2.13	Knee height, sitting	Male	2 007	531	30	464	486	530	582	602
			Female	2 005	484	30	412	439	483	537	563
26	6.2.14	Abdominal depth, sitting	Male	1 881	246	37	180	194	243	307	339
			Female	1 856	233	45	154	175	225	320	360
27	6.2.15	Thorax depth	Male								
			Female								
28	6.2.16	Buttock-abdomen depth, sitting	Male								
			Female								
29	6.3.1	Hand length (stylion)	Male	1 906	193	10	168	175	193	210	211
			Female	1 882	176	9	155	163	176	190	200
30	6.3.2	Palm length perpendicular	Male								
			Female								
31	6.3.3	Hand breadth at metacarpals	Male	1 944	93	9	76	79	92	110	112
			Female	1 678	80	7	67	70	80	90	90
32	6.3.4	Index finger length	Male								
			Female								
33	6.3.5	Index finger breadth, proximal	Male	990	19	2	16	17	19	21	23
			Female	1 003	17	2	14	15	16	20	21
34	6.3.6	Index finger breadth, distal	Male								
			Female								
35	6.3.7	Foot length	Male	1 991	262	12	234	242	261	282	291
			Female	2 001	237	11	211	220	236	256	267
36	6.3.8	Foot breadth	Male	1 989	99	7	84	88	99	110	115
			Female	1 923	90	6	80	82	90	100	106
37	6.3.9	Head length	Male	1 935	191	7	176	179	191	203	206
			Female	1 739	181	6	167	172	181	192	197
38	6.3.10	Head breadth	Male	2 004	153	7	136	141	153	164	168
			Female	1 961	145	7	130	134	145	156	161
39	6.3.11	Face length (menton-sellion)	Male								
			Female								
40	6.3.12	Head circumference	Male								
			Female								
41	6.3.13	Sagittal arc	Male								
			Female								

Table 4 (continued)

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
42	6.3.14	Bitracion arc	Male								
			Female								
43	6.3.15	Thumb length	Male								
			Female								
44	6.3.16	Thumb breadth	Male								
			Female								
45	6.3.17	Hand thickness	Male								
			Female								
46	6.3.18	Hand breadth, including thumb	Male								
			Female								
47	6.3.19	Arm circumference flexed	Male								
			Female								
48	6.3.20	Forearm circumference flexed	Male								
			Female								
49	6.4.1	Wall-acromion distance	Male								
			Female								
50	6.4.2	Grip reach; forward reach	Male								
			Female								
51	6.4.3	Elbow-wrist length	Male	1 899	247	22	204	213	246	282	310
			Female	1 575	224	17	200	202	222	253	279
52	6.4.4	Elbow-grip length	Male								
			Female								
53	6.4.5	Fist (grip axis) height	Male								
			Female								
54	6.4.6	Forearm-fingertip length	Male								
			Female								
55	6.4.7	Buttock-popliteal length (seat depth)	Male	1 992	481	29	413	434	480	529	546
			Female	1 988	475	28	409	427	475	520	541
56	6.4.8	Buttock-knee length	Male								
			Female								
57	6.4.9	Neck circumference	Male								
			Female								
58	6.4.10	Chest circumference	Male	1 965	983	72	835	870	980	1 110	1 175
			Female	1 985	849	97	665	705	840	1 020	1 111
59	6.4.11	Waist circumference	Male	1 978	893	97	700	740	894	1 059	1 160
			Female	1 973	778	117	591	630	750	1 010	1 110
60	6.4.12	Wrist circumference	Male								
			Female								
61	6.4.13	Thigh circumference	Male								
			Female								
62	6.4.14	Calf circumference	Male								
			Female								

Table 4 (continued)

No.	ISO 7250-1:2017		Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement								

^a Definition is different from ISO 7250-1 or substituted. See [Table 3](#).

8.5 Japan

Organization: Japanese Industrial Standards Committee (JISC)

Name of study: Size JPN 2004-06 project, AIST data

Table 5 — Japan: Database

1 Measurement		
1.1	Measured side (right/left)	Right
1.2	Measurement definitions different from those described in ISO 7250-1	6.3.12 (Head circumference): tape measure passes glabella.
1.3	Substituted measurements	None
1.4	Number of measurements not described in ISO 7250-1	99 for females, 93 for males
2 Age range		
2.1	Working age	20 to 65
2.2	Age range of participants	20 to 65
3 Background data		
3.1	Time period of measurement	Size JPN 2004-06: 2004-10-18 to 2006-10-06 AIST data: 2004-12-10 to 2019-5-17
3.2	Location of measurement	Size JPN 2004-06: Tokyo, Osaka, Moriguchi and Kobe. AIST data: Tokyo and its outskirts

Table 5 (continued)

3.3	Survey sample	Participants were paid volunteers aged 20 to 65 years.						
		Size JPN 2004-06				AIST data		
		Age group	Male	Female	Total	Male	Female	Total
		20 to 24	283	350	633	89	39	128
		25 to 29	315	303	618	81	55	136
		30 to 34	340	298	638	52	43	95
		35 to 39	398	283	681	40	34	74
		40 to 44	343	261	604	25	28	53
		45 to 49	319	229	548	26	10	36
		50 to 54	338	242	580	17	7	24
		55 to 59	293	248	541	17	4	21
		60 to 64	197	218	415	4	0	4
		65	59	44	103	3	0	3
3.4	Publication	Reference [8] for Size JPN 2004-06, Reference [18] for AIST data.						
4 Representativeness of the sample								
4.1	Sampling method	Participants were volunteers. The mean height and mean weight of the participants were within ±15 mm and ±1,5 kg of the national average in 2005 according to the Ministry of Education, Sports and Science, except for the male 20 to 24 year old group (19 mm smaller and 3,5 kg lighter).						
4.2	Information on secular change	Significant secular change has been observed in the working age population in Japan. The rate of increase in the mean height of 20-year-old males and females is shown in the following table based on statistics from the Japanese government. Secular increase in mean height ceased in the generation born in and after the 1980s.						
		Rate of secular change in mean height of 20-year-old Japanese (cm/decade)						
		Birth year	Students		General population			
			Male	Fe-male	Male	Female		
		1940 to 1949	2,42	1,81	3,33	3,75		
		1950 to 1959	1,48	0,9	2,71	2,01		
		1960 to 1969	0,95	0,96	2,47	1,14		
		1970 to 1979	-0,29	0,77	0,79	0,43		
		1980 to 1989 ^a			-0,52	-0,29		
		1990 to 1996 ^a			-0,32	-0,09		
20 to 24 years old ^a								
5 Accuracy and reliability of measurements								

Table 5 (continued)

5.1	Intra- and inter-observer error rates	Intra- and inter-observer errors were measured using TEM and the mean absolute difference. Results are reported in “Report of R&D of intellectual infrastructure for small and medium enterprise in fiscal year 2006: Quality control of the traditional and 3-D anthropometry”.
5.2	Measurements from 3D scanners	None
5.3	Other measurement not taken using instruments described in ISO 7250-1	None
5.4	Type of clothing	Male: fitted shorts (stretch fabric). Female: fitted brassiere without supporting function (stretch fabric) and shorts (stretch fabric).

Table 6 — Japan: Statistical summary

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
		Age	Male	2 885	41,6	12,5	20	22	41	63	65
			Female	2 476	40,5	13,5	20	20	40	63	65
1	6.1.1	Body mass (weight), kg	Male	2 877	67,5	9,8	49	54	67	84	96
			Female	2 461	51,9	7,0	39	43	51	64	74
2	6.1.2	Stature (body height)	Male	2 880	1 695,6	59,9	1 555	1 597	1 696	1 795	1 838
			Female	2 462	1 570,3	55,1	1 446	1 481	1 570	1 664	1 703
3	6.1.3	Eye height	Male	2 874	1 579,3	58,3	1 443	1 484	1 579	1 675	1 719
			Female	2 463	1 459,8	54,3	1 338	1 372	1 459	1 552	1 590
4	6.1.4	Shoulder height	Male	2 879	1 369,8	54,3	1 246	1 282	1 369	1 460	1 499
			Female	2 463	1 263,1	50,4	1 151	1 182	1 263	1 350	1 384
5	6.1.5	Elbow height	Male	2 873	1 031,3	42,9	933	960	1 031	1 102	1 136
			Female	2 459	953,0	39,7	861	889	953	1 020	1 049
6	6.1.6	Iliac spine height, standing	Male	2 879	911,9	42,7	814	842	912	982	1 019
			Female	2 462	836,7	38,9	748	774	836	901	930
7	6.1.7	Crotch height	Male	2 878	771,7	39,6	683	707	771	837	868
			Female	2 462	705,7	37,2	621	645	705	768	795
8	6.1.8	Tibial height	Male	2 878	421,0	21,0	376	387	421	457	473
			Female	2 463	384,7	19,1	342	354	384	416	429
9	6.1.9	Chest depth, standing	Male	2 876	196,6	18,5	158	168	196	228	245
			Female	2 452	171,0	16,1	140	149	170	200	216
10	6.1.10	Body depth, standing	Male	2 871	247,5	28,6	190	205	245	296	321
			Female	2 449	220,2	25,3	175	185	217	268	295
11	6.1.11	Chest breadth, standing	Male	2 875	289,0	17,3	252	263	288	319	335
			Female	2 452	256,4	14,4	226	235	255	281	296
12	6.1.12	Hip breadth, standing	Male	2 874	332,4	15,9	297	308	332	359	374
			Female	2 459	330,9	16,8	296	304	330	360	375
13	6.2.1	Sitting height (erect)	Male	2 878	909,9	33,0	831	856	909	964	988
			Female	2 459	849,2	29,8	774	800	850	898	920
14	6.2.2	Eye height, sitting	Male	2 874	789,2	32,1	716	738	789	842	864
			Female	2 457	734,3	28,3	665	687	735	780	802

Table 6 (continued)

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
15	6.2.3	Cervical height, sitting	Male	2 879	669,6	27,2	607	626	670	715	734
			Female	2 458	621,3	24,7	564	580	621	662	680
16	6.2.4	Shoulder height, sitting	Male	2 875	586,3	27,9	523	542	585	633	653
			Female	2 457	545,8	25,4	487	504	546	586	608
17	6.2.5	Elbow height, sitting	Male	2 870	249,6	24,9	195	208	249	292	307
			Female	2 455	235,3	22,9	183	198	235	273	287
18	6.2.6	Shoulder-elbow length	Male	2 871	338,4	15,3	303	314	338	364	374
			Female	2 460	311,8	14,4	280	290	311	337	348
19	6.2.7	Shoulder (biacromial) breadth	Male	2 877	401,6	17,3	362	374	401	431	444
			Female	2 463	358,3	14,7	326	335	358	383	397
20	6.2.8	Shoulder (bideltoïd) breadth	Male	2 875	458,8	23,6	409	423	457	500	521
			Female	2 463	407,4	20,8	366	377	405	444	468
21	6.2.9	Elbow-to-elbow breadth	Male	2 870	426,4	36,2	352	371	425	486	530
			Female	2 459	370,6	35,0	307	322	365	437	472
22	6.2.10	Hip breadth, sitting	Male	2 868	358,8	20,4	313	327	358	393	413
			Female	2 454	360,5	22,2	314	327	359	398	420
23	6.2.11	Popliteal height, sitting	Male	2 869	405,3	21,8	356	370	405	442	457
			Female	2 455	370,5	19,4	328	340	369	403	417
24	6.2.12	Thigh clearance	Male	2 864	149,4	12,9	120	129	149	171	182
			Female	2 453	131,7	11,9	107	114	131	152	162
25	6.2.13	Knee height, sitting	Male	2 868	497,7	25,2	440	456	498	540	558
			Female	2 453	453,6	22,5	405	418	453	492	508
26	6.2.14	Abdominal depth, sitting	Male	2 876	236,4	32,3	174	187	234	290	321
			Female	2 454	210,0	30,3	161	171	204	268	298
27	6.2.15	Thorax depth	Male	2 876	222,9	22,5	174	187	223	261	280
			Female	2 450	208,2	23,0	169	177	205	252	274
28	6.2.16	Buttock-abdomen depth, sitting	Male	2 874	231,0	30,5	172	186	229	283	311
			Female	2 452	212,7	29,5	160	173	208	269	299
29	6.3.1	Hand length (stylion)	Male	2 870	192,5	8,1	175	179	192	206	212
			Female	2 453	178,1	7,9	161	166	178	192	197
30	6.3.2	Palm length perpendicular	Male	2 875	113,8	5,4	103	105	114	123	127
			Female	2 455	105,0	5,3	94	97	105	114	118
31	6.3.3	Hand breadth at metacarpals	Male	2 873	82,1	3,8	73	76	82	89	91
			Female	2 456	73,4	3,5	66	68	73	79	81
32	6.3.4	Index finger length	Male	2 873	70,3	3,8	62	64	70	77	79
			Female	2 455	65,9	3,7	58	60	66	72	75
33	6.3.5	Index finger breadth, proximal	Male	2 873	18,4	1,1	16	17	18	20	21
			Female	2 456	16,5	1,1	14	15	16	18	19
34	6.3.6	Index finger breadth, distal	Male	2 871	15,8	1,2	13	14	16	18	18
			Female	2 454	14,3	1,2	12	13	14	16	17
35	6.3.7	Foot length	Male	2 876	251,3	10,6	228	234	251	270	277
			Female	2 458	230,2	9,6	209	215	230	246	254

Table 6 (continued)

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
36	6.3.8	Foot breadth	Male	2 875	100,6	5,1	89	93	100	109	114
			Female	2 456	92,7	5,0	82	85	93	101	106
37	6.3.9	Head length	Male	2 878	191,4	6,7	176	181	191	203	208
			Female	2 456	180,5	6,3	167	170	180	191	196
38	6.3.10	Head breadth	Male	2 873	163,0	6,1	149	153	163	173	178
			Female	2 455	154,4	5,4	142	145	154	164	167
39	6.3.11	Face length (menton-sellion)	Male	2 879	122,9	6,3	109	113	123	133	138
			Female	2 458	115,2	6,0	102	106	115	125	130
40 ^a	6.3.12	Head circumference	Male	2 877	575,0	15,7	539	549	575	601	615
			Female	2 456	549,5	14,9	515	526	549	574	587
41	6.3.13	Sagittal arc	Male	2 875	390,9	17,2	349	362	391	419	429
			Female	2 450	378,7	14,6	344	354	379	403	413
42	6.3.14	Bitracion arc	Male	2 874	372,6	14,0	342	349	373	396	405
			Female	2 456	359,0	13,9	328	336	359	382	393
43 ^b	6.3.15	Thumb length	Male	354	60,7	3,4	53	56	60	67	69
			Female	220	55,9	3,2	49	51	56	61	62
44 ^b	6.3.16	Thumb breadth	Male	354	20,1	1,1	18	18	20	22	23
			Female	220	17,6	0,9	16	16	18	19	20
45 ^b	6.3.17	Hand thickness	Male	354	32,0	2,2	28	29	32	36	37
			Female	220	27,8	1,8	24	25	28	31	32
46 ^b	6.3.18	Hand breadth, including thumb	Male	354	104,1	4,6	94	97	104	112	116
			Female	220	91,7	3,9	83	85	92	98	100
47	6.3.19	Arm circumference flexed	Male								
			Female								
48	6.3.20	Forearm circumference flexed	Male								
			Female								
49	6.4.1	Wall-acromion distance	Male	2 877	95,1	14,5	60	72	95	119	130
			Female	2 459	86,4	13,5	55	64	86	109	118
50	6.4.2	Grip reach, forward reach	Male	2 867	693,0	34,5	611	635	693	750	773
			Female	2 449	636,2	31,3	565	588	635	690	713
51	6.4.3	Elbow-wrist length	Male	2 868	261,3	14,7	229	237	261	285	298
			Female	2 455	235,6	13,2	206	215	235	258	268
52	6.4.4	Elbow-grip length	Male	2 870	336,0	15,6	300	311	335	362	373
			Female	2 454	306,0	14,8	273	282	305	331	344
53	6.4.5	Fist (grip axis) height	Male	2 873	754,1	35,8	671	697	753	812	840
			Female	2 458	698,5	32,9	624	642	699	752	777
54	6.4.6	Forearm-fingertip length	Male	2 868	448,9	18,4	407	419	449	480	495
			Female	2 452	409,5	17,1	371	382	409	438	452
55	6.4.7	Buttock-popliteal length (seat depth)	Male	2 869	466,4	23,1	415	429	465	507	521
			Female	2 454	447,6	21,4	400	412	448	483	501
56	6.4.8	Buttock-knee length	Male	2 869	565,6	24,9	507	525	565	608	625
			Female	2 454	532,6	22,7	484	497	532	570	589

Table 6 (continued)

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
57	6.4.9	Neck circumference	Male	2 880	373,7	21,2	330	341	372	410	433
			Female	2 462	315,3	17,4	284	291	313	347	367
58	6.4.10	Chest circumference	Male	2 877	930,2	68,9	787	828	924	1 050	1 119
			Female	2 454	837,9	66,8	727	749	827	963	1 040
59	6.4.11	Waist circumference	Male	2 878	827,1	89,6	651	688	823	977	1 061
			Female	2 460	706,5	73,9	589	612	691	850	937
60	6.4.12	Wrist circumference	Male	2 877	171,6	8,9	152	158	171	187	195
			Female	2 458	152,4	8,1	137	141	152	166	175
61	6.4.13	Thigh circumference	Male	2 878	559,4	45,4	463	490	557	637	684
			Female	2 462	534,2	38,8	451	475	533	600	638
62	6.4.14	Calf circumference	Male	2 877	376,1	27,4	315	334	375	422	448
			Female	2 463	343,6	22,5	296	311	342	382	406

^a Definition is different from ISO 7250-1 or substituted. See [Table 5](#).

^b AIST data. See Reference [\[18\]](#).

8.6 Kenya

Organization: Kenya Bureau of Standards (KEBS)

Name of study: —

Table 7 — Kenya: Database

1 Measurement		
1.1	Measured side (right/left)	Right
1.2	Measurement definitions different from those described in ISO 7250-1	6.1.2 stature (body height); 6.1.3 eye height; 6.1.4 shoulder height: the participant stands on the platform of a height scale. The scale lever is adjusted to rest at the desired point. 6.1.5 elbow height; 6.1.6 iliac spine height, standing: the measurements were taken using metre rule and carpenter's tape measure, depending on the participant's height.
1.3	Substituted measurements	6.1.7 crotch height: the data for this measurement were represented by the data taken by measuring the wrist height of the participant standing straight upright on a flat surface. 6.1.11 chest breadth, standing; 6.1.12 hip breadth, standing; 6.2.7 shoulder (biacromial) breadth; 6.2.8 shoulder (bideloid) breadth; 6.2.9 elbow-to-elbow breadth; 6.2.10 hip breadth, sitting: the principle of constant distance at any point between any two lines parallel to each other was applied. Two metre rules were placed at the desired point and held parallel to one another. The constant distance between the two metre rules was then measured with a tape measure.
1.4	Number of measurements not described in ISO 7250-1	None
2 Age range		
2.1	Working age	Official working age: 18 to 60. There are a number of persons over 55 years serving in the public sector in various capacities.
2.2	Age range of participants	18 to 73

Table 7 (continued)

3 Background data																													
3.1	Time period of measurement	Measurements taken between 2006-12 and 2007-02.																											
3.2	Location of measurement	Measurements were carried out in four out of the eight provinces in the country.																											
3.3	Survey sample	The measured participants were working volunteers. Number of participants by age group: <table> <tr> <th>Age group</th><th>Male</th><th>Female</th></tr> <tr> <td>18 to 20</td><td>2</td><td>8</td></tr> <tr> <td>21 to 30</td><td>37</td><td>29</td></tr> <tr> <td>31 to 40</td><td>37</td><td>22</td></tr> <tr> <td>41 to 50</td><td>48</td><td>14</td></tr> <tr> <td>51 to 60</td><td>8</td><td>1</td></tr> <tr> <td>61 to 70</td><td>0</td><td>0</td></tr> <tr> <td>71 to 80</td><td>1</td><td>0</td></tr> <tr> <td>Total</td><td>133</td><td>74</td></tr> </table>	Age group	Male	Female	18 to 20	2	8	21 to 30	37	29	31 to 40	37	22	41 to 50	48	14	51 to 60	8	1	61 to 70	0	0	71 to 80	1	0	Total	133	74
Age group	Male	Female																											
18 to 20	2	8																											
21 to 30	37	29																											
31 to 40	37	22																											
41 to 50	48	14																											
51 to 60	8	1																											
61 to 70	0	0																											
71 to 80	1	0																											
Total	133	74																											
3.4	Publication	The data have not yet been published as the national reference document.																											
4 Representativeness of the sample																													
4.1	Sampling method	Participants were volunteers from various tribes and locations of the country.																											
4.2	Information on secular change	A study in secular change has not been carried out, but due to the social and economic changes being experienced, it is evident that such changes are occurring.																											
5 Accuracy and reliability of measurements																													
5.1	Intra- and inter-observer error rates	The measurements were carried out by three persons. Some measurements were carried out by two observers per participant. For the measurements carried out by one individual, reliability was not measured.																											
5.2	Measurements from 3D scanners	None																											
5.3	Other measurement not taken using instruments described in ISO 7250-1	None																											
5.4	Type of clothing	Male: measurements taken with their shirts and trousers on. Female: measurements taken while they were wearing light tops. Women in Kenya have additional head gear, which consists of artificial hair and braiding. The head measurements taken included the artificial hair and braids, for they constitute the normal everyday part of a Kenyan woman's head attire.																											

Table 8 — Kenya: Statistical summary

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
		Age	Male	133	37,6	9,5	20	24	39	51	55
			Female	74	31,9	8,8	20	20	31	45	51
1	6.1.1	Body mass (weight), kg	Male	133	70,6	13,7	47	52	69	95	106
			Female	74	67,9	13,5	45	49	67	91	99
2 ^a	6.1.2	Stature (body height)	Male	133	1 717,4	74,6	1 536	1 607	1 720	1 850	1 884
			Female	74	1 628,9	69,2	1 490	1 532	1 615	1 735	1 785
3 ^a	6.1.3	Eye height	Male	133	1 612,9	74,1	1 436	1 498	1 610	1 738	1 770
			Female	74	1 524,5	66,7	1 397	1 437	1 512	1 627	1 675

Table 8 (continued)

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
4 ^a	6.1.4	Shoulder height	Male	133	1 440,3	76,7	1 280	1 331	1 442	1 549	1 589
			Female	74	1 369,6	64,3	1 241	1 292	1 358	1 480	1 508
5 ^a	6.1.5	Elbow height	Male	132	1 052,2	61,3	926	963	1 050	1 148	1 197
			Female	74	995,7	64,5	811	900	995	1 082	1 112
6 ^a	6.1.6	Iliac spine height, standing	Male	132	921,8	62,5	780	833	920	1 027	1 101
			Female	73	885,4	50,4	796	818	874	970	1 017
7 ^a	6.1.7	Crotch height	Male	132	812,8	45,1	713	746	818	885	924
			Female	73	768,4	47,0	650	686	770	842	859
8	6.1.8	Tibial height	Male	132	454,5	30,1	377	406	457	500	518
			Female	74	436,6	29,5	377	394	436	490	503
9	6.1.9	Chest depth, standing	Male	130	220,1	28,5	167	181	217	266	316
			Female	74	218,6	32,0	171	178	215	265	306
10	6.1.10	Body depth, standing	Male	127	285,5	42,2	212	227	280	354	391
			Female	74	279,6	41,3	203	213	284	337	350
11 ^a	6.1.11	Chest breadth, standing	Male	128	304,5	30,0	249	259	302	361	372
			Female	74	296,9	37,6	215	245	292	370	380
12 ^a	6.1.12	Hip breadth, standing	Male	127	334,8	28,4	285	292	332	387	405
			Female	74	363,9	35,9	302	308	369	423	434
13	6.2.1	Sitting height (erect)	Male	132	842,2	43,0	767	780	840	910	955
			Female	74	797,3	42,9	709	735	798	874	889
14	6.2.2	Eye height, sitting	Male	132	729,3	38,8	647	670	730	800	821
			Female	74	688,4	39,8	595	633	687	757	772
15	6.2.3	Cervical height, sitting	Male	127	609,4	34,1	543	566	608	670	697
			Female	74	575,6	32,2	514	523	575	627	643
16	6.2.4	Shoulder height, sitting	Male	130	562,2	32,2	500	510	560	610	639
			Female	74	536,4	32,3	480	483	535	590	614
17	6.2.5	Elbow height, sitting	Male	131	198,8	31,0	135	148	200	251	260
			Female	74	198,9	26,9	150	159	200	239	252
18	6.2.6	Shoulder-elbow length	Male	131	362,8	28,3	291	320	360	409	430
			Female	74	338,2	23,9	289	305	340	371	398
19 ^a	6.2.7	Shoulder (biacromial) breadth	Male	127	362,9	43,4 ^b	232 ^b	279	370	413	452
			Female	72	345,2	34,5	254	292	344	397	425
20 ^a	6.2.8	Shoulder (bideltoid) breadth	Male	129	448,9	39,5	360	387	450	510	545
			Female	73	437,1	40,1	363	380	432	498	532
21 ^a	6.2.9	Elbow-to-elbow breadth	Male	130	459,6	48,3	367	392	457	544	574
			Female	74	455,2	53,8	354	372	450	545	558
22 ^a	6.2.10	Hip breadth, sitting	Male	130	361,4	37,3	293	303	359	424	456
			Female	74	401,9	40,0	331	339	401	470	491
23	6.2.11	Popliteal height, sitting	Male	131	438,5	24,0	395	400	440	480	489
			Female	73	412,0	24,1	366	378	410	455	472
24	6.2.12	Thigh clearance	Male	132	151,0	19,2	111	120	150	185	196
			Female	74	161,0	23,9	125	128	160	190	241

Table 8 (continued)

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
25	6.2.13	Knee height, sitting	Male	131	544,3	29,7	480	500	547	600	609
			Female	73	524,0	27,5	467	485	520	570	590
26	6.2.14	Abdominal depth, sitting	Male	130	261,8	45,0	181	197	263	333	366
			Female	74	267,1	45,0	183	200	265	338	367
27	6.2.15	Thorax depth	Male	131	233,4	27,1	182	194	231	280	294
			Female	74	265,4	40,7	197	201	263	330	369
28	6.2.16	Buttock-abdomen depth, sitting	Male	127	260,3	43,0	184	197	258	330	354
			Female	74	275,2	51,7	177	193	278	347	392
29	6.3.1	Hand length (stylium)	Male	133	191,7	10,4	168	177	191	210	220
			Female	73	182,8	11,1	159	167	182	199	207
30	6.3.2	Palm length perpendicular	Male	131	106,4	6,5	94	96	105	118	123
			Female	74	102,2	6,2	91	94	102	114	116
31	6.3.3	Hand breadth at metacarpals	Male	133	86,8	6,2	75	77	86	97	106
			Female	73	80,4	5,2	72	74	80	89	94
32	6.3.4	Index finger length	Male	133	73,4	5,9	63	65	73	82	88
			Female	74	69,9	6,7	57	61	69	80	87
33	6.3.5	Index finger breadth, proximal	Male	130	21,6	1,7	18	19	21	24	26
			Female	73	19,6	1,8	15	17	20	22	24
34	6.3.6	Index finger breadth, distal	Male	130	18,3	1,4	15	16	18	20	22
			Female	72	16,7	1,4	14	14	17	19	19
35	6.3.7	Foot length	Male	132	263,6	14,2	228	242	264	288	299
			Female	74	246,1	12,6	225	229	244	270	281
36	6.3.8	Foot breadth	Male	132	99,6	6,6	87	90	100	111	117
			Female	74	92,2	6,1	80	84	94	101	103
37	6.3.9	Head length	Male	132	200,2	8,4	178	187	201	213	218
			Female	74	196,4	8,6	176	181	197	210	213
38	6.3.10	Head breadth	Male	132	152,3	6,4	139	143	152	162	169
			Female	74	148,2	7,7	133	138	147	161	167
39	6.3.11	Face length (menton-sellion)	Male	133	115,7	7,7	99	104	114	130	132
			Female	73	109,8	7,9	96	99	108	121	133
40	6.3.12	Head circumference	Male	133	575,3	31,6 ^b	424 ^b	545	580	610	620
			Female	74	576,4	34,8 ^b	482 ^b	540	580	620	625
41	6.3.13	Sagittal arc	Male	133	340,1	16,1	312	318	345	370	382
			Female	71	352,5	23,6	299	310	350	390	402
42	6.3.14	Bitragion arc	Male	133	356,8	15,6	325	332	355	380	397
			Female	73	365,1	18,7	330	335	365	394	410
43	6.3.15	Thumb length	Male								
			Female								
44	6.3.16	Thumb breadth	Male								
			Female								
45	6.3.17	Hand thickness	Male								
			Female								

Table 8 (continued)

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
46	6.3.18	Hand breadth, including thumb	Male								
			Female								
47	6.3.19	Arm circumference flexed	Male								
			Female								
48	6.3.20	Forearm circumference flexed	Male								
			Female								
49	6.4.1	Wall-acromion distance	Male	128	143,7	17,4	110	116	145	177	188
			Female	72	136,8	17,7	100	105	140	160	174
50	6.4.2	Grip reach; forward reach	Male	132	764,3	45,5	672	691	760	840	884
			Female	73	723,8	49,5	649	659	720	809	864
51	6.4.3	Elbow-wrist length	Male	130	303,1	27,8 ^b	259	272	300	338	407 ^b
			Female	74	282,9	19,7	233	257	285	314	333
52	6.4.4	Elbow-grip length	Male	129	381,7	26,8	323	347	378	428	449
			Female	73	359,3	26,2	318	325	355	410	421
53	6.4.5	Fist (grip axis) height	Male	130	729,3	42,7	644	660	730	794	815
			Female	74	698,2	46,4	620	633	696	762	829
54	6.4.6	Forearm-finger-tip length	Male	129	490,7	24,5	431	452	490	531	545
			Female	73	461,0	25,5	413	423	460	504	532
55	6.4.7	Buttock-popliteal length (seat depth)	Male	100	497,0	31,9	426	450	496	550	564
			Female	60	509,2	37,9	444	455	510	570	609
56	6.4.8	Buttock-knee length	Male	129	608,2	32,7	555	561	607	662	694
			Female	73	608,5	35,6	500	561	610	660	669
57	6.4.9	Neck circumference	Male	132	372,1	29,4	317	330	370	420	449
			Female	74	331,5	25,0	283	293	330	378	390
58	6.4.10	Chest circumference	Male	132	925,4	87,2	745	799	920	1 068	1 141
			Female	74	950,4	101,8	764	813	950	1 120	1 184
59	6.4.11	Waist circumference	Male	132	857,1	100,2	663	721	854	1 037	1 081
			Female	74	818,4	104,9	625	660	810	984	1 013
60	6.4.12	Wrist circumference	Male	133	168,8	13,1	143	149	170	190	198
			Female	74	161,9	12,5	138	144	160	185	191
61	6.4.13	Thigh circumference	Male	129	541,2	63,7	420	440	530	655	675
			Female	71	611,6	72,4	494	500	610	720	783
62	6.4.14	Calf circumference	Male	131	359,1	35,7	299	307	360	416	464
			Female	74	366,8	33,8	303	320	370	416	456

^a Definition is different from ISO 7250-1 or substituted. See [Table 7](#).

^b Unusual values (see [7.5](#)).

8.7 The Republic of Korea

Organization: Korean Agency for Technology and Standards (KATS)

Name of study: The 7th Size Korea Project

Table 9 — The Republic of Korea: Database

1 Measurement					
1.1	Measured side (right/left)	Right			
1.2	Measurement definitions different from those described in ISO 7250-1	None			
1.3	Substituted measurements	None			
1.4	Number of measurements not described in ISO 7250-1	71 dimensions for male; 74 dimensions for female			
2 Age range					
2.1	Working age	16 to 69			
2.2	Age range of participants	16 to 69			
3 Background data					
3.1	Time period of measurement	2015			
3.2	Location of measurement	The Republic of Korea			
3.3	Survey sample	Age			
		Male			
		Female			
		Subtotal			
		16 to 19	996	928	1 924
		20 to 29	868	668	1 536
		30 to 39	652	676	1 328
		40 to 49	310	360	670
50 to 60	220	359	579		
60 to 69	143	230	373		
	Total	3 189	3 221	6 410	
3.4	Publication	Reference [9]			
4 Representativeness of the sample					
4.1	Sampling method	Participants were volunteers and not randomly selected.			
4.2	Information on secular change	None			
5 Accuracy and reliability of measurements					
5.1	Intra- and inter-observer error rates	Relative TEM was less than 2 %			
5.2	Measurements from 3D scanners	None			
5.3	Other measurement not taken using instruments described in ISO 7250-1	None			
5.4	Type of clothing	Male: fitted shorts suitable for anthropometric measurement. Female: fitted sports brassiere and shorts, suitable for anthropometric measurement. See ISO 20685-1:2018, Figure A.1.			

Table 10 — The Republic of Korea: Statistical summary

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
		Age	Male	3 189	29,9	13,5	16	16	26	59	67
			Female	3 221	32,8	15,1	16	16	30	61	67
1	6.1.1	Body mass (weight), kg	Male	3 186	71,0	11,8	48	54	70	92	105
			Female	3 221	56,8	8,8	41	45	56	73	86
2	6.1.2	Stature (body height)	Male	3 189	1 722,4	59,5	1 582	1 625	1 722	1 821	1 861
			Female	3 221	1 587,1	57,4	1 455	1 492	1 587	1 682	1 720
3	6.1.3	Eye height	Male	3 189	1 602,7	58,5	1 468	1 508	1 601	1 698	1 746
			Female	3 221	1 471,2	54,6	1 346	1 381	1 471	1 561	1 601
4	6.1.4	Shoulder height	Male	3 189	1 393,6	53,7	1 271	1 306	1 393	1 485	1 521
			Female	3 221	1 280,8	50,8	1 164	1 198	1 281	1 365	1 405
5	6.1.5	Elbow height	Male	3 189	1 054,1	42,3	959	986	1 053	1 127	1 156
			Female	3 221	967,6	40,4	874	902	968	1 034	1 068
6	6.1.6	Iliac spine height, standing	Male	3 189	935,2	43,6	832	864	935	1 008	1 034
			Female	3 221	854,3	44,2	747	780	856	924	955
7	6.1.7	Crotch height	Male	3 189	787,4	39,6	695	721	788	853	884
			Female	3 221	724,2	36,8	640	664	724	784	812
8	6.1.8	Tibial height	Male	3 189	449,4	25,7	389	404	450	491	505
			Female	3 221	409,0	24,0	353	369	409	448	463
9	6.1.9	Chest depth, standing	Male	3 189	208,8	21,5	163	175	208	245	263
			Female	3 221	191,5	20,0	154	163	189	228	245
10	6.1.10	Body depth, standing	Male	3 189	248,5	31,3	187	201	246	303	329
			Female	3 221	239,9	29,1	186	199	236	292	326
11	6.1.11	Chest breadth, standing	Male	3 189	312,6	23,6	264	276	311	352	380
			Female	3 221	278,5	16,1	245	255	277	307	321
12	6.1.12	Hip breadth, standing	Male	3 189	327,1	18,0	289	300	326	357	375
			Female	3 221	325,7	18,1	288	298	325	356	375
13	6.2.1	Sitting height (erect)	Male	3 189	926,6	31,9	850	875	927	978	1 002
			Female	3 221	865,6	29,6	795	817	865	914	936
14	6.2.2	Eye height, sitting	Male	3 189	808,8	31,0	734	759	809	858	882
			Female	3 221	755,4	28,1	692	709	756	801	823
15	6.2.3	Cervical height, sitting	Male	3 189	678,3	27,5	614	633	679	723	743
			Female	3 221	629,1	25,8	567	586	630	672	692
16	6.2.4	Shoulder height, sitting	Male	3 189	602,3	27,2	539	558	603	647	667
			Female	3 221	564,0	25,0	507	523	563	605	625
17	6.2.5	Elbow height, sitting	Male	3 189	263,8	26,0	205	220	264	306	324
			Female	3 221	253,4	23,8	200	215	254	293	311
18	6.2.6	Shoulder-elbow length	Male	3 188	345,5	15,6	310	320	346	371	383
			Female	3 221	315,5	15,6	279	290	316	342	352
19	6.2.7	Shoulder (biacromial) breadth	Male	3 189	396,1	19,5	346	364	396	427	443
			Female	3 221	357,9	15,6	321	333	358	384	393

Table 10 (continued)

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
20	6.2.8	Shoulder (bideltoïd) breadth	Male	3 189	462,4	29,9	396	415	462	512	535
			Female	3 221	414,5	27,2	360	375	412	461	495
21	6.2.9	Elbow-to-elbow breadth	Male	3 188	452,9	50,5	351	375	450	535	571
			Female	3 221	394,9	41,8	315	335	391	468	513
22	6.2.10	Hip breadth, sitting	Male	3 189	351,6	24,7	301	314	350	393	423
			Female	3 221	356,7	24,2	306	321	355	399	426
23	6.2.11	Popliteal height, sitting	Male	3 182	428,3	20,8	380	394	428	464	477
			Female	3 220	391,0	18,6	348	361	390	422	433
24	6.2.12	Thigh clearance	Male	3 189	149,3	14,4	120	128	148	174	187
			Female	3 220	134,0	13,0	108	114	133	156	172
25	6.2.13	Knee height, sitting	Male	3 181	522,9	23,2	469	486	522	563	578
			Female	3 221	479,3	21,8	430	444	479	516	530
26	6.2.14	Abdominal depth, sitting	Male	3 189	223,7	35,7	160	173	220	289	322
			Female	3 221	207,7	34,8	148	160	203	272	310
27	6.2.15	Thorax depth	Male	3 189	221,0	25,2	167	180	220	264	282
			Female	3 221	220,5	27,5	169	180	218	270	294
28	6.2.16	Buttock-abdomen depth, sitting	Male	3 189	233,3	35,5	168	182	230	296	328
			Female	3 221	230,1	34,4	170	184	224	294	328
29	6.3.1	Hand length (stylion)	Male	3 189	181,8	8,3	164	169	182	196	202
			Female	3 221	168,5	7,2	152	157	168	181	187
30	6.3.2	Palm length perpendicular	Male	3 189	103,9	5,7	91	95	104	113	117
			Female	3 221	96,9	4,6	87	90	97	105	108
31	6.3.3	Hand breadth at metacarpals	Male	3 189	82,0	4,4	72	75	82	89	93
			Female	3 221	74,0	4,1	65	68	74	81	84
32	6.3.4	Index finger length	Male	3 189	67,8	4,0	59	61	68	75	78
			Female	3 220	63,3	3,9	54	57	63	70	73
33	6.3.5	Index finger breadth, proximal	Male	3 189	18,5	1,3	16	17	18	21	22
			Female	3 221	16,6	1,3	14	15	16	19	20
34	6.3.6	Index finger breadth, distal	Male	3 189	15,9	1,3	14	14	16	18	19
			Female	3 221	14,3	1,2	12	13	14	16	17
35	6.3.7	Foot length	Male	3 189	254,1	11,6	228	236	254	274	281
			Female	3 221	232,7	10,0	210	216	233	249	257
36	6.3.8	Foot breadth	Male	3 189	100,5	6,7	82	89	101	111	115
			Female	3 221	92,2	5,2	80	84	92	101	105
37	6.3.9	Head length	Male	3 189	185,5	7,2	168	174	185	197	202
			Female	3 221	176,1	6,5	161	165	176	187	192
38	6.3.10	Head breadth	Male	3 189	158,7	6,6	143	148	159	169	175
			Female	3 221	151,3	5,8	137	142	152	161	165
39	6.3.11	Face length (menton-sellion)	Male	3 189	115,1	6,9	99	104	115	126	131
			Female	3 221	108,9	6,2	95	99	109	119	124

Table 10 (continued)

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
40	6.3.12	Head circumference	Male	3 189	570,2	15,8	535	545	570	596	609
			Female	3 221	554,6	15,6	520	530	555	580	592
41	6.3.13	Sagittal arc	Male	3 189	328,6	19,1	290	300	327	363	378
			Female	3 221	316,4	23,9	274	285	310	361	375
42	6.3.14	Bitragion arc	Male	3 189	370,8	15,8	333	345	371	396	407
			Female	3 221	348,9	19,0	305	316	350	378	388
43	6.3.15	Thumb length	Male								
			Female								
44	6.3.16	Thumb breadth	Male								
			Female								
45	6.3.17	Hand thickness	Male	3 189	25,8	2,0	21	23	26	29	31
			Female	3 221	22,5	1,8	18	20	23	25	26
46	6.3.18	Hand breadth, including thumb	Male								
			Female								
47	6.3.19	Arm circumference flexed	Male	3 188	305,5	33,0	233	252	305	362	387
			Female	3 221	263,8	29,3	210	221	260	315	350
48	6.3.20	Forearm circumference flexed	Male								
			Female								
49	6.4.1	Wall-acromion distance	Male	3 189	88,4	21,0	48	56	87	126	140
			Female	3 221	85,2	23,3	41	51	84	126	141
50	6.4.2	Grip reach; forward reach	Male	3 188	710,2	34,3	631	656	710	768	794
			Female	3 221	657,1	33,0	583	604	656	713	734
51	6.4.3	Elbow-wrist length	Male	3 188	270,0	16,5	232	244	270	296	307
			Female	3 221	249,3	13,1	219	228	249	271	282
52	6.4.4	Elbow-grip length	Male	3 188	333,9	18,0	292	305	334	364	376
			Female	3 221	308,4	16,0	273	282	308	335	347
53	6.4.5	Fist (grip axis) height	Male	3 188	769,0	35,1	689	712	768	829	855
			Female	3 221	710,8	34,3	628	654	710	768	795
54	6.4.6	Forearm-fingertip length	Male	3 188	455,6	20,3	409	422	455	489	505
			Female	3 221	417,9	17,6	377	390	417	447	460
55	6.4.7	Buttock-popliteal length (seat depth)	Male	3 182	489,4	23,0	440	454	489	529	546
			Female	3 221	468,3	22,3	416	432	468	505	523
56	6.4.8	Buttock-knee length	Male	3 182	573,7	25,9	516	533	573	618	636
			Female	3 221	542,1	24,2	487	504	542	582	604
57	6.4.9	Neck circumference	Male	3 186	376,8	24,5	326	340	375	420	440
			Female	3 192	327,6	20,5	290	300	325	365	390
58	6.4.10	Chest circumference	Male	3 188	920,6	81,3	757	791	919	1 060	1 125
			Female	3 220	871,6	81,3	725	756	862	1 024	1 091
59	6.4.11	Waist circumference	Male	3 188	816,4	98,2	635	671	812	985	1 065
			Female	3 220	754,4	92,5	600	627	740	930	1 020

Table 10 (continued)

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
60	6.4.12	Wrist circumference	Male	3 188	161,6	8,8	143	148	161	177	185
			Female	3 221	146,7	9,2	129	133	145	164	172
61	6.4.13	Thigh circumference	Male	3 189	566,1	51,5	458	484	565	653	703
			Female	3 221	549,8	43,6	464	487	546	625	682
62	6.4.14	Calf circumference	Male	3 189	377,1	29,8	315	330	376	429	454
			Female	3 221	347,6	26,4	293	309	345	394	422

8.8 The Netherlands

Organization: Netherlands Normalisatie-instituut (NEN)

Name of study: Delft study, CAESAR Netherlands

Table 11 — The Netherlands: Database

1 Measurement		
1.1	Measured side (right/left)	Right
1.2	Measurement definitions different from those described in ISO 7250-1	6.1.2 stature (body height); 6.1.7 crotch height and 6.4.10 chest circumference: feet approximately 10 cm apart with toes rotated approximately 33°. 6.2.13 knee height: taken from medial side with left leg moved out of way. Scan-extracted: 6.1.4 shoulder height; 6.2.7 shoulder (biacromial) breadth; 6.3.8 foot breadth. Scanning posture: foot outlines approximately 10 cm apart with toes rotated approximately 30°; arms and wrists straight with hands 20 cm from body, palms facing inward, fingers spread.
1.3	Substituted measurements	6.1.3 eye height: computed from: 6.1.2 – (6.2.1 – 6.2.2); 6.1.5 elbow height: computed from: 6.1.2 – (6.2.1 + 6.2.5); 6.2.6 shoulder-elbow length: computed from 6.2.4 – 6.2.5.
1.4	Number of measurements not described in ISO 7250-1	78 dimensions See Reference [15]. Copies: National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.
2 Age range		
2.1	Working age	18 to 65
2.2	Age range of participants	18 to 65
3 Background data		
3.1	Time period of measurement	1999-08 to 2000-09
3.2	Location of measurement	Soesterberg (the Netherlands); participants from all 12 provinces of the Netherlands.
3.3	Survey sample	Participants were volunteers aged 18 to 65 years and randomly selected. Data were weighted in the published report according to age, education and ethnicity.
3.4	Publication	Reference [10]. Copies: TNO, P.O. Box 23, 3769 ZG Soesterberg (the Netherlands). Reference [11]. Reference [12].
4 Representativeness of the sample		
4.1	Sampling method	Participants were volunteers from all provinces.

Table 11 (continued)

4.2	Information on secular change	None
5 Accuracy and reliability of measurements		
5.1	Intra- and inter-observer error rates	Reliability of measurements for each observer was not reported.
5.2	Measurements from 3D scanners	6.1.4 shoulder height; 6.2.7 shoulder (biacromial) breadth; 6.3.8 foot breadth. Scanning posture: foot outlines approximately 10 cm apart with toes rotated approximately 30°; arms and wrists straight with hands 20 cm from body, palms facing inward, fingers spread.
5.3	Other measurement not taken using instruments described in ISO 7250-1	None
5.4	Type of clothing	Male: fitted shorts (stretch fabric) suitable for scanning. Female: fitted sports brassiere (stretch fabric) and shorts (stretch fabric) suitable for scanning.

Table 12 — The Netherlands: Statistical summary

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
		Age ^b	Male	564	38,5	13,4	18	19	38	60	64
			Female	698	38,6	12,8	18	20	38	60	64
1	6.1.1	Body mass (weight), kg	Male	595	85,6	17,3	57	62	83	117	143
			Female	679	73,9	15,8	46	53	72	103	119
2 ^a	6.1.2	Stature (body height)	Male	563	1 808,1	92,8	1 600	1 672	1 806	1 959	2 054
			Female	679	1 672,3	79,0	1 488	1 528	1 673	1 799	1 864
3 ^{ab}	6.1.3	Eye height	Male	558	1 695,9	84,4	1 488	1 565	1 695	1 842	1 916
			Female	691	1 569,1	73,2	1 397	1 447	1 568	1 689	1 749
4 ^c	6.1.4	Shoulder height	Male	542	1 476,4	81,3	1 304	1 352	1 474	1 625	1 682
			Female	587	1 361,5	70,5	1 203	1 230	1 361	1 477	1 529
5 ^{ab}	6.1.5	Elbow height	Male	562	1 122,6	66,1	965	1 018	1 121	1 239	1 296
			Female	685	1 040,7	54,4	917	949	1 038	1 126	1 181
6	6.1.6	Iliac spine height, standing	Male								
			Female								
7 ^a	6.1.7	Crotch height	Male	588	838,2	63,5	696	743	839	933	1 014
			Female	674	785,3	53,0	624	706	789	876	910
8	6.1.8	Tibial height	Male								
			Female								
9	6.1.9	Chest depth, standing	Male								
			Female								
10	6.1.10	Body depth, standing	Male								
			Female								
11	6.1.11	Chest breadth, standing	Male								
			Female								
12	6.1.12	Hip breadth, standing	Male								
			Female								

Table 12 (continued)

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
13	6.2.1	Sitting height (erect)	Male	589	941,8	42,5	846	876	943	1 012	1 043
			Female	677	884,6	38,1	797	819	887	943	973
14	6.2.2	Eye height, sitting	Male	594	825,4	39,7	746	760	828	892	923
			Female	676	774,5	35,8	701	713	776	830	856
15	6.2.3	Cervical height, sitting	Male								
			Female								
16	6.2.4	Shoulder height, sitting	Male	590	629,9	36,0	549	566	628	688	725
			Female	675	589,5	33,2	522	536	591	642	670
17	6.2.5	Elbow height, sitting	Male	590	254,6	28,3	190	210	255	300	328
			Female	664	248,0	27,0	189	204	247	293	321
18 ^{ab}	6.2.6	Shoulder-elbow length	Male	555	376,6	23,0	323	339	377	415	434
			Female	683	342,5	20,0	295	311	343	378	389
19 ^c	6.2.7	Shoulder (biacromial) breadth	Male	542	413,8	25,4	357	377	412	456	472
			Female	586	375,2	22,2	319	339	374	412	427
20	6.2.8	Shoulder (bidel-toid) breadth	Male	590	472,5	30,4	415	428	471	522	564
			Female	678	433,2	31,6	369	390	430	490	522
21 ^d	6.2.9	Elbow-to-elbow breadth	Male	181	496,6	37,1	402	431	496	560	568
			Female	207	463,3	43,9	367	395	461	542	568
22	6.2.10	Hip breadth, sitting	Male	589	383,1	29,8	327	340	382	438	465
			Female	677	418,9	38,3	336	363	414	487	523
23 ^d	6.2.11	Popliteal height, sitting	Male	181	485,8	30,2	408	440	484	538	556
			Female	207	436,1	26,7	373	391	436	483	493
24 ^d	6.2.12	Thigh clearance	Male	181	146,2	14,5	112	121	146	173	189
			Female	207	146,9	14,6	117	124	146	174	184
25 ^a	6.2.13	Knee height, sitting	Male	584	557,1	36,0	481	501	558	617	661
			Female	664	510,7	28,8	438	464	512	560	578
26 ^d	6.2.14	Abdominal depth, sitting	Male	181	283,5	40,3	202	220	282	349	398
			Female	207	276,5	45,9	186	209	271	358	395
27	6.2.15	Thorax depth	Male								
			Female								
28	6.2.16	Buttock-abdomen depth, sitting	Male								
			Female								
29	6.3.1	Hand length (stylion)	Male	595	202,8	11,2	178	184	203	221	232
			Female	679	184,5	9,9	161	168	184	201	206
30	6.3.2	Palm length perpendicular	Male								
			Female								
31 ^d	6.3.3	Hand breadth at metacarpals	Male	181	90,8	4,7	80	84	91	99	102
			Female	207	80,2	4,2	70	74	80	88	91
32	6.3.4	Index finger length	Male								
			Female								
33	6.3.5	Index finger breadth, proximal	Male								
			Female								

Table 12 (continued)

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
34 ^d	6.3.6	Index finger breadth, distal	Male	181	18,5	1,5	15	16	18	21	21
			Female	207	16,1	1,5	12	14	16	19	20
35	6.3.7	Foot length	Male	594	268,9	15,9	237	246	268	296	325
			Female	679	243,2	13,0	208	222	244	264	273
36 ^c	6.3.8	Foot breadth	Male	542	103,9	7,4	89	91	104	116	123
			Female	584	94,9	6,7	80	86	95	107	113
37	6.3.9	Head length	Male	590	197,7	8,0	178	184	198	210	216
			Female	679	187,7	6,8	172	176	188	199	203
38	6.3.10	Head breadth	Male	593	153,2	5,9	139	145	153	163	169
			Female	679	146,0	5,5	135	138	146	155	160
39	6.3.11	Face length (menton-sellion)	Male	590	122,9	7,4	105	111	123	135	138
			Female	679	112,8	6,5	98	103	112	123	129
40	6.3.12	Head circumference	Male	589	574,3	18,2	532	544	575	606	616
			Female	676	550,3	15,4	517	523	550	574	583
41	6.3.13	Sagittal arc	Male								
			Female								
42	6.3.14	Bitracion arc	Male								
			Female								
43	6.3.15	Thumb length	Male								
			Female								
44	6.3.16	Thumb breadth	Male								
			Female								
45	6.3.17	Hand thickness	Male								
			Female								
46	6.3.18	Hand breadth, including thumb	Male								
			Female								
47	6.3.19	Arm circumference flexed	Male								
			Female								
48	6.3.20	Forearm circumference flexed	Male								
			Female								
49	6.4.1	Wall-acromion distance	Male								
			Female								
50 ^d	6.4.2	Grip reach; forward reach	Male	181	751,5	44,4	647	670	745	823	871
			Female	207	684,9	35,3	592	627	685	745	770
51	6.4.3	Elbow-wrist length	Male								
			Female								
52 ^d	6.4.4	Elbow-grip length	Male	181	355,5	20,7	310	324	354	393	414
			Female	207	322,1	17,0	284	294	321	349	364
53 ^d	6.4.5	Fist (grip axis) height	Male	181	804,0	46,5	698	730	803	879	930
			Female	207	747,9	40,0	647	679	748	816	839
54 ^d	6.4.6	Forearm-finger-tip length	Male	181	483,2	25,0	427	447	481	530	556
			Female	207	438,7	19,5	393	407	437	470	484

Table 12 (continued)

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
55 ^d	6.4.7	Buttock-popliteal length (seat depth)	Male	181	508,4	29,3	440	462	505	565	584
			Female	207	497,6	27,5	442	452	500	545	567
56	6.4.8	Buttock-knee length	Male	589	636,2	37,4	559	583	634	703	736
			Female	678	608,1	31,2	541	557	608	664	693
57	6.4.9	Neck circumference	Male								
			Female								
58	6.4.10	Chest circumference	Male	594	1 028,5	104,4	842	883	1 016	1 225	1 301
			Female	679	1 010,0	121,9	805	859	980	1 249	1 339
59	6.4.11	Waist circumference	Male								
			Female								
60	6.4.12	Wrist circumference	Male								
			Female								
61	6.4.13	Thigh circumference	Male								
			Female								
62	6.4.14	Calf circumference	Male								
			Female								

^a Definition is different from ISO 7250-1 or substituted. See [Table 11](#).

^b Unweighted data, see [Table 11](#), 3.3.

^c Scan-extracted, see [Table 11](#), 1.2 and 5.2.

^d Data from Delft study.

8.9 Thailand

Organization: Thai Industrial Standards Institute (TISI)

Name of study: —

Table 13 — Thailand: Database

1 Measurement		
1.1	Measured side (right/left)	Right
1.2	Measurement definitions different from those described in ISO 7250-1	Not shown in the report.
1.3	Substituted measurements	None
1.4	Number of measurements not described in ISO 7250-1	Not shown in the report
2 Age range		
2.1	Working age	20 to 60
2.2	Age range of participants	30 to 39
3 Background data		

Table 13 (continued)

3.1	Time period of measurement	2000-11 to 2001-04
3.2	Location of measurement	Females in 19 provinces and males in 12 provinces from four regions of Thailand.
3.3	Survey sample	Not shown in the report
3.4	Publication	Reference [13]
4 Representativeness of the sample		
4.1	Sampling method	Not shown in the report
4.2	Information on secular change	None
5 Accuracy and reliability of measurements		
5.1	Intra- and inter-observer error rates	No report
5.2	Measurements from 3D scanners	None
5.3	Other measurement not taken using instruments described in ISO 7250-1	None
5.4	Type of clothing	Lightest clothing without shoes or socks

Table 14 — Thailand: Statistical summary

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
		Age	Male								
			Female								
1	6.1.1	Body mass (weight), kg	Male	1 246	64,3	9,5		51,0	63,8	81,9	
			Female	1 170	53,5	8,2		42,0	52,5	69,0	
2	6.1.2	Stature (body height)	Male	1 246	1 666	59		1 576	1 663	1 770	
			Female	1 170	1 547	50		1 467	1 546	1 633	
3	6.1.3	Eye height	Male	1 246	1 550	58		1 462	1 549	1 650	
			Female	1 170	1 433	49		1 353	1 433	1 515	
4	6.1.4	Shoulder height	Male	1 246	1 370	56		1 282	1 369	1 467	
			Female	1 170	1 265	46		1 190	1 265	1 340	
5	6.1.5	Elbow height	Male	1 246	1 025	54		953	1 024	1 100	
			Female	1 170	951	39		895	952	1 014	
6	6.1.6	Iliac spine height, standing	Male	1 246	918	45		849	915	995	
			Female	1 170	872	41		810	872	937	
7	6.1.7	Crotch height	Male								
			Female								
8	6.1.8	Tibial height	Male	1 246	453	26		410	452	498	
			Female	1 170	385	18		357	385	415	
9	6.1.9	Chest depth, standing	Male	1 246	184	18		157	183	217	
			Female	1 170	176	20		149	173	213	
10	6.1.10	Body depth, standing	Male								
			Female								

Table 14 (continued)

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
11	6.1.11	Chest breadth, standing	Male	1 246	298	21		270	298	334	
			Female	1 170	261	20		232	258	298	
12	6.1.12	Hip breadth, standing	Male	1 246	325	22		295	325	360	
			Female	1 170	325	22		294	325	362	
13	6.2.1	Sitting height (erect)	Male	1 246	870	35		813	870	925	
			Female	1 170	824	28		778	823	873	
14	6.2.2	Eye height, sitting	Male	1 246	758	33		705	758	810	
			Female	1 170	714	29		814 ^a	666 ^a	714 ^a	
15	6.2.3	Cervical height, sitting	Male	1 246	635	31		590	634	682	
			Female	1 170	599	26		560	599	640	
16	6.2.4	Shoulder height, sitting	Male								
			Female	1 170	546	25		509	546	588	
17	6.2.5	Elbow height, sitting	Male	1 246	232	31		185	230	279	
			Female	1 170	231	22		197	230	267	
18	6.2.6	Shoulder-elbow length	Male	1 246	348	17		322	347	375	
			Female								
19	6.2.7	Shoulder (biacromial) breadth	Male	1 246	372	29		330	370	420	
			Female	1 170	344	26		305	342	390	
20	6.2.8	Shoulder (bideltoid) breadth	Male	1 246	446	26		407	446	489	
			Female	1 170	400	26		362	397	448	
21	6.2.9	Elbow-to-elbow breadth	Male	1 246	447	39		399	447	504	
			Female	1 170	405	30		361	402	462	
22	6.2.10	Hip breadth, sitting	Male	1 246	345	24		310	343	382	
			Female	1 170	352	27		310	350	400	
23	6.2.11	Popliteal height, sitting	Male	1 246	414	21		380	413	450	
			Female	1 170	389	22		355	389	423	
24	6.2.12	Thigh clearance	Male	1 246	140	16		124 ^a	139	163	
			Female	1 170	137	12		117	137	159	
25	6.2.13	Knee height, sitting	Male	1 246	509	28		470	508	556	
			Female	1 170	497	22		463	496	532	
26	6.2.14	Abdominal depth, sitting	Male								
			Female								
27	6.2.15	Thorax depth	Male	1 246	206	20		179	204	237	
			Female	1 170	216	24		182	213	261	
28	6.2.16	Buttock-abdomen depth, sitting	Male	1 246	219	28		181	215	270	
			Female	1 170	218	30		177	215	276	
29	6.3.1	Hand length (stylium)	Male	1 246	195	11		180	195	212	
			Female	1 170	180	8		167	180	194	
30	6.3.2	Palm length perpendicular	Male	1 246	112	8		102	110	123	
			Female	1 170	103	5		95	102	110	
31	6.3.3	Hand breadth at metacarpals	Male	1 246	84	6		76	83	92	
			Female	1 170	73	4		66	73	80	

Table 14 (continued)

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
32	6.3.4	Index finger length	Male	1 246	76	5		70 ^a	75	85	
			Female	1 170	72	4		65	71	79	
33	6.3.5	Index finger breadth, proximal	Male	1 246	16 ^a	1 ^a		15 ^a	16 ^a	18 ^a	
			Female	1 170	16 ^a	1 ^a		14 ^a	16 ^a	19 ^a	
34	6.3.6	Index finger breadth, distal	Male	1 246	19 ^a	1 ^a		17 ^a	19 ^a	21 ^a	
			Female	1 170	17 ^a	1 ^a		15 ^a	17 ^a	18 ^a	
35	6.3.7	Foot length	Male	1 246	247	12		229	246	267	
			Female	1 170	227	10		210	227	243	
36	6.3.8	Foot breadth	Male	1 246	100	10 ^a		90	103	110	
			Female	1 170	94	7		83	95	105	
37	6.3.9	Head length	Male								
			Female	1 170	170	60 ^a		160	170	181	
38	6.3.10	Head breadth	Male	1 246	161	6		151	161	171	
			Female	1 170	146	6		136	146	155	
39	6.3.11	Face length (menton-sellion)	Male								
			Female								
40	6.3.12	Head circumference	Male	1 246	553	16		529	553	580	
			Female	1 170	538	15		515	538	563	
41	6.3.13	Sagittal arc	Male	1 246	392	18		360	390	420	
			Female	1 170	336	12		320 ^a	335	355	
42	6.3.14	Bitracion arc	Male	1 246	384	14		360	382	410	
			Female	1 170	351	14		330	350	375	
43	6.3.15	Thumb length	Male								
			Female								
44	6.3.16	Thumb breadth	Male								
			Female								
45	6.3.17	Hand thickness	Male								
			Female								
46	6.3.18	Hand breadth, including thumb	Male								
			Female								
47	6.3.19	Arm circumference flexed	Male								
			Female								
48	6.3.20	Forearm circumference flexed	Male								
			Female								
49	6.4.1	Wall-acromion distance	Male	1 246	103	15		80	100	125	
			Female								
50	6.4.2	Grip reach; forward reach	Male	1 246	719	34		665	720	780	
			Female	1 170	678	32		627	677	730	
51	6.4.3	Elbow-wrist length	Male	1 246	278	17 ^a		260 ^a	277	305	
			Female	1 170	240	12		220	240	260	
52	6.4.4	Elbow-grip length	Male								
			Female	1 170	292	16		268	292	318	

Table 14 (continued)

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
53	6.4.5	Fist (grip axis) height	Male	1 246	739	37		683	740	800	
			Female	1 170	696	31		647	696	746	
54	6.4.6	Forearm-fingertip length	Male	1 246	465	21		430	464	500	
			Female	1 170	423	19		392	422	453	
55	6.4.7	Buttock-popliteal length (seat depth)	Male	1 246	471	32		416	472	522	
			Female	1 170	474	24		437	473	515	
56	6.4.8	Buttock-knee length	Male	1 246	566	29		520	565	611	
			Female	1 170	546	25		507	545	587	
57	6.4.9	Neck circumference	Male	1 246	401 ^a	21 ^a		370 ^a	400 ^a	440 ^a	
			Female	1 170	377 ^a	20 ^a		347 ^a	375 ^a	410 ^a	
58	6.4.10	Chest circumference	Male	1 246	879	58		790	874	980	
			Female	1 170	862	79		750	850	1 010	
59	6.4.11	Waist circumference	Male	1 246	801	74		690	800	930	
			Female	1 170	689	71		600	675	830	
60	6.4.12	Wrist circumference	Male	1 246	164	15 ^a		150	162	180	
			Female	1 170	147	9		135 ^a	145	162	
61	6.4.13	Thigh circumference	Male	1 246	563	56		470	560	660	
			Female	1 170	534	47		465	530	625	
62	6.4.14	Calf circumference	Male	1 246	358	29		315	355	405	
			Female	1 170	338	26		300	335	385	

^a Unusual values. See 7.5.

8.10 The United States of America

Organization: American National Standards Institute (ANSI)

Name of study: CAESAR

Table 15 — The United States of America: Database

1 Measurement		
1.1	Measured side (right/left)	Right
1.2	Measurement definitions different from those described in ISO 7250-1	6.1.2 stature (body height); 6.1.7 crotch height; 6.4.10 chest circumference: feet approximately 10 cm apart with toes rotated approximately 33°. 6.2.13 knee height: taken from medial side with left leg moved out of way. Scan-extracted: 6.1.4 shoulder height, 6.2.7 shoulder (biacromial) breadth, 6.3.8 foot breadth. Scanning posture: foot outlines approximately 10 cm apart with toes rotated approximately 30°; arms and wrists straight with hands 20 cm from body, palms facing inward, fingers spread.
1.3	Substituted measurements	None
1.4	Number of measurements not described in ISO 7250-1	78 dimensions. See Reference [15]. Copies: National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.
2 Age range		
2.1	Working age	18 to 65

Table 15 (continued)

2.2	Age range of participants	18 to 65																																																																																											
3 Background data																																																																																													
3.1	Time period of measurement	1998-04 to 2000-07																																																																																											
3.2	Location of measurement	10 US States: California, Georgia, Iowa, Michigan, Minnesota, New Jersey, North Carolina, Ohio, Oregon, Texas, as well as Ottawa, Ontario, Canada																																																																																											
3.3	Survey sample	<table><tr><th colspan="2"></th><th colspan="6">Age group</th><th></th></tr><tr><th>Gender</th><th>Race group</th><th><20</th><th>20 to 29</th><th>30 to 39</th><th>40 to 49</th><th>50 to 59</th><th>W60</th><th>Total</th></tr><tr><td rowspan="8">Female</td><td>White</td><td>16</td><td>177</td><td>232</td><td>292</td><td>173</td><td>72</td><td></td><td>962</td></tr><tr><td>African American</td><td>8</td><td>54</td><td>30</td><td>41</td><td>14</td><td>1</td><td></td><td>148</td></tr><tr><td>Native American/Alaskan</td><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td></td><td>4</td></tr><tr><td>Hispanic</td><td>3</td><td>6</td><td>5</td><td>2</td><td>1</td><td>1</td><td></td><td>18</td></tr><tr><td>Asian/Pacific islander</td><td>8</td><td>31</td><td>21</td><td>17</td><td>11</td><td>5</td><td></td><td>93</td></tr><tr><td>Other not listed/mixed race</td><td>0</td><td>9</td><td>9</td><td>7</td><td>5</td><td>2</td><td></td><td>32</td></tr><tr><td>Missing</td><td>0</td><td>1</td><td>2</td><td>0</td><td>2</td><td>0</td><td></td><td>5</td></tr><tr><td>Total</td><td>35</td><td>279</td><td>300</td><td>360</td><td>207</td><td>81</td><td></td><td>1 262</td></tr></table>			Age group							Gender	Race group	<20	20 to 29	30 to 39	40 to 49	50 to 59	W60	Total	Female	White	16	177	232	292	173	72		962	African American	8	54	30	41	14	1		148	Native American/Alaskan	0	1	1	1	1	0		4	Hispanic	3	6	5	2	1	1		18	Asian/Pacific islander	8	31	21	17	11	5		93	Other not listed/mixed race	0	9	9	7	5	2		32	Missing	0	1	2	0	2	0		5	Total	35	279	300	360	207	81		1 262
				Age group																																																																																									
Gender	Race group	<20	20 to 29	30 to 39	40 to 49	50 to 59	W60	Total																																																																																					
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	African American	8	54	30	41	14	1		148																																																																																				
	Native American/Alaskan	0	1	1	1	1	0		4																																																																																				
	Hispanic	3	6	5	2	1	1		18																																																																																				
	Asian/Pacific islander	8	31	21	17	11	5		93																																																																																				
	Other not listed/mixed race	0	9	9	7	5	2		32																																																																																				
	Missing	0	1	2	0	2	0		5																																																																																				
	Total	35	279	300	360	207	81		1 262																																																																																				
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		Age group																																																																																											
Gender	Race group	<20	20 to 29	30 to 39	40 to 49	50 to 59	W60	Total																																																																																					
Male	White	12	181	241	224	161	49		868																																																																																				
	African American	4	35	37	24	16	0		116																																																																																				
	Native American/Alaskan	0	0	0	1	0	2		3																																																																																				
	Hispanic	3	13	7	8	1	1		33																																																																																				
	Asian/Pacific islander	4	23	22	18	10	6		83																																																																																				
	Other not listed/mixed race	0	7	4	4	1	0		16																																																																																				
	Missing	0	1	1	0	0	0		2																																																																																				
	Total	23	260	312	279	189	58		1 121																																																																																				
3.4	Publication	Reference [14]. Copies: National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.																																																																																											
4 Representativeness of the sample																																																																																													
4.1	Sampling method	Volunteers from 10 geographical locations.																																																																																											
4.2	Information on secular change	The sampling of this data set did not allow conclusions about secular change.																																																																																											
5 Accuracy and reliability of measurements																																																																																													

Table 15 (continued)

5.1	Intra- and inter-observer error rates	Reliability of measurements for each observer was not reported.
5.2	Measurements from 3D scanners	6.1.4 shoulder height; 6.2.7 shoulder (biacromial) breadth; 6.3.8 foot breadth. Scanning posture: foot outlines approximately 10 cm apart with toes rotated approximately 30°; arms and wrists straight with hands 20 cm from body, palms facing inward, fingers spread.
5.3	Other measurement not taken using instruments described in ISO 7250-1	None
5.4	Type of clothing	Male: fitted shorts (stretch fabric) suitable for scanning. Female: fitted sports brassiere (stretch fabric) and shorts (stretch fabric) suitable for scanning.

Table 16 — The United States of America: Statistical summary

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
		Age ^b	Male	1 121	39,3	11,9	19	21	39	60	64
			Female	1 262	39,8	12,1	19	21	40	61	64
1	6.1.1	Body mass (weight), kg	Male	1 119	83,2	17,4	56	63	80	115	141
			Female	1 261	69,6	19,9	45	49	66	103	141
2 ^a	6.1.2	Stature (body height)	Male	1 119	1 766,6	80,6	1 606	1 650	1 759	1 901	1 965
			Female	1 261	1 637,9	78,4	1 491	1 526	1 630	1 767	1 825
3	6.1.3	Eye height	Male								
			Female								
4 ^c	6.1.4	Shoulder height	Male	1 113	1 445,2	76,4	1 288	1 341	1 442	1 570	1 633
			Female	1 257	1 342,5	69,9	1 210	1 243	1 336	1 456	1 514
5	6.1.5	Elbow height	Male								
			Female								
6	6.1.6	Iliac spine height, standing	Male								
			Female								
7 ^a	6.1.7	Crotch height	Male	1 119	797,0	54,9	692	719	796	880	923
			Female	1 260	747,7	52,9	646	672	744	831	864
8	6.1.8	Tibial height	Male								
			Female								
9	6.1.9	Chest depth, standing	Male								
			Female								
10	6.1.10	Body depth, standing	Male								
			Female								
11	6.1.11	Chest breadth, standing	Male								
			Female								
12	6.1.12	Hip breadth, standing	Male								
			Female								
13	6.2.1	Sitting height (erect)	Male	1 119	920,6	42,8	827	856	919	985	1 018
			Female	1 260	864,1	38,7	783	809	861	925	952
14	6.2.2	Eye height, sitting	Male	1 119	803,2	41,5	713	739	801	867	896
			Female	1 260	754,5	36,6	675	701	753	811	836

Table 16 (continued)

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
15	6.2.3	Cervical height, sitting	Male								
			Female								
16	6.2.4	Shoulder height, sitting	Male	1 119	601,9	37,8	522	549	601	656	687
			Female	1 261	567,5	31,6	501	523	566	615	641
17	6.2.5	Elbow height, sitting	Male	1 119	239,1	35,1	170	190	239	287	305
			Female	1 260	236,9	29,8	173	193	236	280	304
18	6.2.6	Shoulder-elbow length	Male								
			Female								
19 ^c	6.2.7	Shoulder (biacromial) breadth	Male	1 113	418,6	23,0	371	383	418	455	469
			Female	1 257	375,9	22,3	331	343	375	412	429
20	6.2.8	Shoulder (bidel-toid) breadth	Male	1 119	490,4	37,8	422	440	486	550	592
			Female	1 261	431,4	39,1	372	385	426	493	555
21	6.2.9	Elbow-to-elbow breadth	Male								
			Female								
22	6.2.10	Hip breadth, sitting	Male	1 117	376,3	38,1	311	329	372	435	483
			Female	1 259	410,4	52,9	331	348	403	501	557
23	6.2.11	Popliteal height, sitting	Male								
			Female								
24	6.2.12	Thigh clearance	Male								
			Female								
25 ^a	6.2.13	Knee height, sitting	Male	1 119	558,0	32,1	489	513	556	607	638
			Female	1 261	508,5	31,3	450	466	506	556	585
26	6.2.14	Abdominal depth, sitting	Male								
			Female								
27	6.2.15	Thorax depth	Male								
			Female								
28	6.2.16	Buttock-abdomen depth, sitting	Male								
			Female								
29	6.3.1	Hand length (stylion)	Male	1 119	202,0	12,0	178	186	201	219	230
			Female	1 260	181,7	12,1	159	166	180	199	209
30	6.3.2	Palm length perpendicular	Male								
			Female								
31	6.3.3	Hand breadth at metacarpals	Male								
			Female								
32	6.3.4	Index finger length	Male								
			Female								
33	6.3.5	Index finger breadth, proximal	Male								
			Female								
34	6.3.6	Index finger breadth, distal	Male								
			Female								
35	6.3.7	Foot length	Male	1 119	266,7	15,4	232	244	265	290	304
			Female	1 261	239,1	14,2	211	220	238	260	271

Table 16 (continued)

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
36 ^c	6.3.8	Foot breadth	Male	1 114	104,1	8,0	88	92	104	116	121
			Female	1 258	92,8	8,5	73	81	93	105	112
37	6.3.9	Head length	Male	1 119	199,9	10,4	183	187	200	212	216
			Female	1 260	188,5	7,1	172	177	188	199	203
38	6.3.10	Head breadth	Male	1 119	154,5	6,7	142	145	154	164	170
			Female	1 260	146,2	5,3	134	137	145	154	159
39	6.3.11	Face length (menton-sellion)	Male	1 118	121,3	8,0	104	110	121	133	140
			Female	1 260	111,7	7,1	97	101	111	122	126
40	6.3.12	Head circumference	Male	1 119	577,1	18,1	543	551	576	604	616
			Female	1 260	552,0	18,1	518	525	551	581	596
41	6.3.13	Sagittal arc	Male								
			Female								
42	6.3.14	Bitragion arc	Male								
			Female								
43	6.3.15	Thumb length	Male								
			Female								
44	6.3.16	Thumb breadth	Male								
			Female								
45	6.3.17	Hand thickness	Male								
			Female								
46	6.3.18	Hand breadth, including thumb	Male								
			Female								
47	6.3.19	Arm circumference flexed	Male								
			Female								
48	6.3.20	Forearm circumference flexed	Male								
			Female								
49	6.4.1	Wall-acromion distance	Male								
			Female								
50	6.4.2	Grip reach, forward reach	Male								
			Female								
51	6.4.3	Elbow-wrist length	Male								
			Female								
52	6.4.4	Elbow-grip length	Male								
			Female								
53	6.4.5	Fist (grip axis) height	Male								
			Female								
54	6.4.6	Forearm-fingertip length	Male								
			Female								
55	6.4.7	Buttock-popliteal length (seat depth)	Male								
			Female								
56	6.4.8	Buttock-knee length	Male	1 119	614,0	36,5	544	562	610	673	708
			Female	1 260	587,7	40,5	507	533	584	648	695

Table 16 (continued)

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
57	6.4.9	Neck circumference	Male								
			Female								
58 ^a	6.4.10	Chest circumference	Male	1 119	1 023,6	112,7	837	884	1 008	1 210	1 354
			Female	1 261	964,3	140,6	783	814	932	1 207	1 374
59	6.4.11	Waist circumference	Male								
			Female								
60	6.4.12	Wrist circumference	Male								
			Female								
61	6.4.13	Thigh circumference	Male								
			Female								
62	6.4.14	Calf circumference	Male								
			Female								

^a Definition is different from ISO 7250-1 or substituted. See [Table 15](#).

^b Unweighted data, see [Table 15](#), 3.3.

^c Scan-extracted, see [Table 15](#), 1.2 and [5.2](#).

8.11 China

Organization: China National Institute of Standardization (CNIS)

Name of study: —

Table 17 — China: Database

1 Measurement		
1.1	Measured side (right/left)	Right
1.2	Measurement definitions different from those described in ISO 7250-1	6.1.11 chest breadth standing: measured at the nipple level. 6.3.3 hand breadth: distance between the first and the fifth metacarpal heads (hand breadth, diagonal). 6.3.12 head circumference: tape measure passes glabella.
1.3	Substituted measurements	None
1.4	Number of measurements not described in ISO 7250-1	8 dimensions
2 Age range		
2.1	Working age	18 to 60 for males, 18 to 55 for females.
2.2	Age range of participants	18 to 60 for males, 18 to 55 for females.
3 Background data		
3.1	Time period of measurement	1986 to 1987
3.2	Location of measurement	16 provinces in China.
3.3	Survey sample	22 314
3.4	Publication	Reference [16]

Table 17 (continued)

4 Representativeness of the sample		
4.1	Sampling method	Stratified random cluster sampling.
4.2	Information on secular change	None
5 Accuracy and reliability of measurements		
5.1	Intra- and inter-observer error rates	No information
5.2	Measurements from 3D scanners	None
5.3	Other measurement not taken using instruments described in ISO 7250-1	None
5.4	Type of clothing	Underwear

Table 18 — China: Data

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
		Age	Male								
			Female								
1	6.1.1	Body mass (weight), kg	Male	11 164	60	8	44	48	59	75	83
			Female	11 150	52	8	39	42	52	66	74
2	6.1.2	Stature (body height)	Male	11 164	1 678	59	1 543	1 583	1 678	1 775	1 814
			Female	11 150	1 571	54	1 449	1 484	1 570	1 659	1 697
3	6.1.3	Eye height	Male	11 164	1 568	58	1 436	1 474	1 568	1 664	1 705
			Female	11 150	1 455	53	1 337	1 371	1 454	1 541	1 579
4	6.1.4	Shoulder height	Male	11 164	1 367	53	1 244	1 281	1 367	1 455	1 494
			Female	11 150	1 272	47	1 166	1 195	1 271	1 350	1 385
5	6.1.5	Elbow height	Male	11 164	1 024	44	925	954	1 024	1 096	1 128
			Female	11 150	961	38	873	899	960	1 023	1 050
6	6.1.6	Iliac spine height, standing	Male								
			Female								
7	6.1.7	Crotch height	Male	11 164	791	39	701	728	790	856	887
			Female	11 150	732	36	648	673	732	792	819
8	6.1.8	Tibial height	Male	11 164	444	22	394	409	444	481	498
			Female	11 150	410	21	363	377	410	444	459
9	6.1.9	Chest depth, standing	Male								
			Female								
10	6.1.10	Body depth, standing	Male								
			Female								
11 ^a	6.1.11	Chest breadth, standing	Male	11 164	282	19	242	253	280	315	331
			Female	11 150	262	20	219	233	260	299	319
12	6.1.12	Hip breadth, standing	Male	11 164	307	16	273	282	306	334	346
			Female	11 150	317	18	275	290	317	346	360
13	6.2.1	Sitting height (erect)	Male	11 164	908	30	836	858	908	958	979
			Female	11 150	855	28	789	809	855	901	920

Table 18 (continued)

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
14	6.2.2	Eye height, sitting	Male	11 164	798	30	729	749	798	847	868
			Female	11 150	739	27	678	695	739	783	803
15	6.2.3	Cervical height, sitting	Male	11 164	658	26	599	615	657	701	719
			Female	11 150	618	24	563	579	617	657	675
16	6.2.4	Shoulder height, sitting	Male	11 164	598	26	539	557	598	641	659
			Female	11 150	556	23	504	518	556	594	609
17	6.2.5	Elbow height, sitting	Male	11 164	263	22	214	228	263	298	312
			Female	11 150	250	21	201	215	251	284	299
18	6.2.6	Shoulder-elbow length	Male								
			Female								
19	6.2.7	Shoulder (biacromial) breadth	Male	11 164	374	18	330	344	375	403	415
			Female	11 150	350	17	304	320	351	377	387
20	6.2.8	Shoulder (bideltoid) breadth	Male	11 164	432	22	383	398	431	469	486
			Female	11 150	398	23	347	363	397	438	458
21	6.2.9	Elbow-to-elbow breadth	Male	11 164	425	36	353	371	422	489	518
			Female	11 150	407	39	326	348	404	478	509
22	6.2.10	Hip breadth, sitting	Male	11 164	323	18	284	295	321	355	369
			Female	11 150	345	22	295	310	344	382	400
23	6.2.11	Popliteal height, sitting	Male	11 164	414	20	372	383	413	448	463
			Female	11 150	379	19	331	342	382	405	417
24	6.2.12	Thigh clearance	Male	11 164	131	12	103	112	130	151	160
			Female	11 150	131	11	107	113	130	151	160
25	6.2.13	Knee height, sitting	Male	11 164	493	23	441	456	493	532	549
			Female	11 150	458	21	410	424	458	493	507
26	6.2.14	Abdominal depth, sitting	Male								
			Female								
27	6.2.15	Thorax depth	Male	11 164	213	18	176	186	212	245	261
			Female	11 150	201	21	159	170	199	239	260
28	6.2.16	Buttock-abdomen depth, sitting	Male								
			Female								
29	6.3.1	Hand length (stylion)	Male	11 164	183	8	164	170	183	196	202
			Female	11 150	171	8	154	159	171	183	189
30	6.3.2	Palm length perpendicular	Male								
			Female								
31 ^a	6.3.3	Hand breadth at metacarpals	Male	11 164	82	4	73	76	82	89	91
			Female	11 150	76	4	67	70	76	82	84
32	6.3.4	Index finger length	Male	11 164	69	4	60	63	69	76	79
			Female	11 150	66	4	57	60	66	72	76
33	6.3.5	Index finger breadth, proximal	Male	11 164	19	1	17	18	19	21	21
			Female	11 150	17	1	15	16	17	19	20
34	6.3.6	Index finger breadth, distal	Male	11 164	16	1	14	15	16	18	19
			Female	11 150	15	1	13	14	15	16	17

Table 18 (continued)

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
35	6.3.7	Foot length	Male	11 164	247	10	223	230	247	264	272
			Female	11 150	229	9	208	213	229	244	251
36	6.3.8	Foot breadth	Male	11 164	96	5	86	88	96	103	107
			Female	11 150	88	4	78	81	88	95	98
37	6.3.9	Head length	Male	11 164	184	7	168	173	184	195	200
			Female	11 150	176	7	161	165	176	187	191
38	6.3.10	Head breadth	Male	11 164	154	6	141	145	154	164	168
			Female	11 150	149	5	137	141	149	158	162
39	6.3.11	Face length (menton-sellion)	Male	11 164	119	7	104	109	119	130	135
			Female	11 150	109	6	97	100	109	119	123
40 ^a	6.3.12	Head circumference	Male	11 164	561	15	525	536	560	586	597
			Female	11 150	546	16	510	520	546	573	585
41	6.3.13	Sagittal arc	Male	11 164	349	15	314	324	350	375	384
			Female	11 150	329	12	300	310	329	349	358
42	6.3.14	Bitracion arc	Male	11 164	361	13	330	338	361	383	392
			Female	11 150	349	13	318	327	348	372	381
43	6.3.15	Thumb length	Male								
			Female								
44	6.3.16	Thumb breadth	Male								
			Female								
45	6.3.17	Hand thickness	Male								
			Female								
46	6.3.18	Hand breadth, including thumb	Male								
			Female								
47	6.3.19	Arm circumference flexed	Male								
			Female								
48	6.3.20	Forearm circumference flexed	Male								
			Female								
49	6.4.1	Wall-acromion distance	Male								
			Female								
50	6.4.2	Grip reach; forward reach	Male								
			Female								
51	6.4.3	Elbow-wrist length	Male								
			Female								
52	6.4.4	Elbow-grip length	Male								
			Female								
53	6.4.5	Fist (grip axis) height	Male	11 164	741	37	656	680	741	801	828
			Female	11 150	704	32	630	650	704	757	778
54	6.4.6	Forearm-fingertip length	Male								
			Female								
55	6.4.7	Buttock-popliteal length (seat depth)	Male	11 164	457	22	407	421	457	494	510
			Female	11 150	434	21	388	401	433	469	485

Table 18 (continued)

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
56	6.4.8	Buttock-knee length	Male	11 164	554	24	499	515	554	595	613
			Female	11 150	531	23	481	495	529	570	587
57	6.4.9	Neck circumference	Male								
			Female								
58	6.4.10	Chest circumference	Male	11 164	872	54	762	791	867	970	1 018
			Female	11 150	833	63	717	745	825	949	1 005
59	6.4.11	Waist circumference	Male	11 164	733	78	604	632	718	880	944
			Female	11 150	695	80	561	590	680	844	910
60	6.4.12	Wrist circumference	Male								
			Female								
61	6.4.13	Thigh circumference	Male								
			Female								
62	6.4.14	Calf circumference	Male								
			Female								
^a Definition is different from ISO 7250-1 or substituted. See Table 17 .											

8.12 India

Organization: Bureau of Indian Standards (BIS)

Name of study: Anthropometric and strength data of Indian agricultural workers for farm equipment design

Table 19 — India: Database

1 Measurement																							
1.1	Measured side (right/left)	Right																					
1.2	Measurement definitions different from those described in ISO 7250-1	6.1.10 body depth standing: measured to the most anterior point on the abdomen. 6.3.9 head length: measured using a large sliding caliper. 6.3.10 head breadth: measured using a large sliding caliper. 6.4.1 wall-acromion distance: measurements were taken with arms hanging down. 6.4.2 grip reach forward reach (shoulder grip length): the arm of anthropometer rather than a rod was used to indicate the grip axis. 6.4.4 elbow-grip length: the arm of anthropometer rather than a rod was used to indicate the grip axis. 6.4.8 buttock-knee length: measured using a large sliding caliper and measuring cube, 200 mm on each side, was not used. 6.4.7 buttock-popliteal length: measured using a large sliding caliper and measuring cube, 200 mm on each side, was not used.																					
1.3	Substituted measurements	6.1.11 chest breadth standing: substituted with chest breadth measured at the nipple level. 6.3.1 hand length: substituted with hand length measured from the most distal crease at the wrist. 6.3.2 palm length perpendicular (palm length): substituted with palm length measured from the most distal crease at the wrist. 6.4.5 fist (grip axis) height was substituted with metacarpal III height.																					
1.4	Number of measurements not described in ISO 7250-1	The study includes a number of measurements which are not described in ISO 7250-1. However, the data reported here is for only those measurements which are described in this document.																					
2 Age range																							
2.1	Working age	16 to 67																					
2.2	Age range of participants	16 to 67																					
3 Background data																							
3.1	Time period of measurement	2003 to 2007																					
3.2	Location of measurement	At the agricultural research centres, workplaces or villages of workers in different regions of the country.																					
3.3	Survey sample	12 525 agricultural workers: 8 025 male and 4 500 female from different regions, religions and races in 12 states: Arunachal Pradesh, Gujarat, Jammu and Kashmir, Madhya Pradesh, Maharashtra, Meghalaya, Mizoram, Orissa, Punjab, Tamil Nadu, Uttar Pradesh and West Bengal. <table> <tr> <th>Age</th><th>Male (%)</th><th>Female (%)</th></tr> <tr> <td>16 to 20</td><td>8</td><td>7</td></tr> <tr> <td>21 to 30</td><td>34</td><td>33</td></tr> <tr> <td>31 to 40</td><td>31</td><td>37</td></tr> <tr> <td>41 to 50</td><td>18</td><td>18</td></tr> <tr> <td>41 to 65</td><td>9</td><td>5</td></tr> <tr> <td>Total</td><td>100</td><td>100</td></tr> </table>	Age	Male (%)	Female (%)	16 to 20	8	7	21 to 30	34	33	31 to 40	31	37	41 to 50	18	18	41 to 65	9	5	Total	100	100
Age	Male (%)	Female (%)																					
16 to 20	8	7																					
21 to 30	34	33																					
31 to 40	31	37																					
41 to 50	18	18																					
41 to 65	9	5																					
Total	100	100																					
3.4	Publication	Updated data from Reference [17].																					
4 Representativeness of the sample																							
^a Harpenden Anthropometer, Siber Hegner Anthropometer and IIT Kharagpur Anthropometer are examples of suitable products available commercially. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of these products.																							

Table 19 (continued)

4.1	Sampling method	The stratified random sampling technique was followed. The whole country was divided into different regions or states and the sample size was decided in proportion to the agricultural workers population. Then the region or state was divided into agro-climatic zones and from each agro-climatic zone, anthropometric data on agricultural workers were collected.
4.2	Information on secular change	The sampling of this data set did not allow conclusions about secular change.
5 Accuracy and reliability of measurements		
5.1	Intra- and inter-observer error rates	Accuracy in linear measurement is reported as 3 mm.
5.2	Measurements from 3D scanners	No measurements were taken from 3D scanners. For measurement of anthropometric dimension, Harpenden Anthropometer, Siber Hegner Anthropometer or IIT Kharagpur Anthropometer were used. ^a
5.3	Other measurement not taken using instruments described in ISO 7250-1	Not applicable.
5.4	Type of clothing	Male: thin fabric shorts, pants or traditional wear (dhoti). Female: thin fabric traditional wear (e.g. blouse and saree, salwar suit). Some male participants wore turban (head gear). In the case of female participants, some participants had a particular Indian hairstyle (hair knot behind the head) and some participants wore a cloth head gear.
^a Harpenden Anthropometer, Siber Hegner Anthropometer and IIT Kharagpur Anthropometer are examples of suitable products available commercially. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of these products.		

Table 20 — India: Data

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
		Age	Male	8 025	34,0	10,2	18	20	33	52	59
			Female	4 500	34,5	9,5	18	20	35	50	58
1	6.1.1	Body mass (weight), kg	Male	8 025	54,7	8,7	38	42	54	70	79
			Female	4 500	46,3	7,8	32	35	45	60	70
2	6.1.2	Stature (body height)	Male	8 025	1 633	68	1 472	1 522	1 631	1 748	1 800
			Female	4 500	1 515	61	1 384	1 419	1 513	1 625	1 678
3	6.1.3	Eye height	Male	8 025	1 522	69	1 358	1 410	1 521	1 635	1 692
			Female	4 500	1 403	61	1 263	1 306	1 400	1 510	1 561
4	6.1.4	Shoulder height	Male	8 025	1 362	65	1 210	1 255	1 362	1 468	1 518
			Female	4 500	1 261	56	1 134	1 173	1 260	1 362	1 404
5	6.1.5	Elbow height	Male	8 025	999	52	871	915	1 000	1 085	1 130
			Female	4 500	936	46	838	864	934	1 012	1 058
6	6.1.6	Iliac spine height, standing	Male	8 025	907	58	770	810	910	1 000	1 040
			Female	4 500	853	50	740	778	850	940	973
7	6.1.7	Crotch height	Male								
			Female								
8	6.1.8	Tibial height	Male								
			Female								
9	6.1.9	Chest depth, standing	Male	8 025	208	21	163	175	206	242	277
			Female	4 500	207	32	145	155	203	265	299

Table 20 (continued)

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
10 ^a	6.1.10	Body depth, standing	Male	8 025	226	33	160	175	223	288	315
			Female	4 500	210	35	141	157	208	270	309
11 ^a	6.1.11	Chest breadth, standing	Male	8 025	276	36	195	219	276	336	359
			Female	4 415	252	28	199	211	250	305	329
12	6.1.12	Hip breadth, standing	Male	8 025	301	28	224	258	301	348	377
			Female	4 500	287	30	221	240	286	338	362
13	6.2.1	Sitting height (erect)	Male	8 025	830	52	651	743	833	905	943
			Female	4 500	775	44	665	706	773	850	883
14	6.2.2	Eye height, sitting	Male	8 025	726	52	544	641	729	800	847
			Female	4 500	671	44	566	604	670	743	785
15	6.2.3	Cervical height, sitting	Male								
			Female								
16	6.2.4	Shoulder height, sitting	Male	8 025	568	47	419	498	569	640	693
			Female	4 500	529	41	415	466	529	597	635
17	6.2.5	Elbow height, sitting	Male	8 025	214	32	145	166	211	271	300
			Female	4 500	208	31	141	160	207	260	285
18	6.2.6	Shoulder-elbow length	Male								
			Female								
19	6.2.7	Shoulder (biacromial) breadth	Male	8 025	330	44	252	272	320	416	445
			Female	4 500	292	30	232	248	287	344	370
20	6.2.8	Shoulder (bidel-toid) breadth	Male	8 025	416	33	340	366	414	474	498
			Female	4 500	371	32	300	325	368	429	456
21	6.2.9	Elbow-to-elbow breadth	Male	8 025	375	47	276	302	370	460	490
			Female	4 500	350	39	263	286	350	414	445
22	6.2.10	Hip breadth, sitting	Male	8 025	311	32	224	255	312	361	391
			Female	4 500	302	32	223	250	302	354	380
23	6.2.11	Popliteal height, sitting	Male	8 025	417	31	335	367	419	465	498
			Female	4 500	391	30	324	341	392	440	466
24	6.2.12	Thigh clearance	Male	8 025	129	22	89	99	126	170	192
			Female	4 500	124	24	82	90	121	167	192
25	6.2.13	Knee height, sitting	Male	8 025	504	36	420	450	502	565	611
			Female	4 500	468	30	398	420	468	518	542
26	6.2.14	Abdominal depth, sitting	Male								
			Female								
27	6.2.15	Thorax depth	Male								
			Female								
28	6.2.16	Buttock-abdomen depth, sitting	Male	8 025	217	33	151	170	214	276	310
			Female	4 500	214	32	150	166	210	270	303
29 ^{ab}	6.3.1	Hand length (stylion)	Male	8 025	178 ^b	11	151 ^b	160 ^b	179 ^b	196 ^b	205 ^b
			Female	4 500	167 ^b	10	143 ^b	151 ^b	166 ^b	182 ^b	190 ^b
30 ^{ab}	6.3.2	Palm length perpendicular	Male	8 025	101 ^b	8	83 ^b	89 ^b	100 ^b	113 ^b	120 ^b
			Female	4 500	94 ^b	7	76 ^b	80 ^b	95 ^b	105 ^b	114 ^b

Table 20 (continued)

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
31	6.3.3	Hand breadth at metacarpals	Male	8 025	80	7	64	69	80	90	97
			Female	4 500	72	6	56	61	72	83	88
32	6.3.4	Index finger length	Male								
			Female								
33	6.3.5	Index finger breadth, proximal	Male	7 344	17 ^c	3 ^c	10 ^c	12 ^c	16 ^c	23 ^c	25 ^c
			Female	4 060	15 ^c	3 ^c	11 ^c	12 ^c	15 ^c	20 ^c	22 ^c
34	6.3.6	Index finger breadth, distal	Male								
			Female								
35	6.3.7	Foot length	Male	8 025	245	15	210	220	245	270	280
			Female	4 500	225	15	187	202	225	249	260
36	6.3.8	Foot breadth	Male	8 025	94	9	70	78	94	110	116
			Female	4 500	89	8	70	75	89	101	107
37 ^a	6.3.9	Head length	Male	8 025	185 ^c	12 ^c	158 ^c	167 ^c	185 ^c	204 ^c	220 ^c
			Female	4 500	179 ^c	14 ^c	149 ^c	155 ^c	180 ^c	202 ^c	220 ^c
38 ^a	6.3.10	Head breadth	Male	8 025	148 ^c	14 ^c	115 ^c	129 ^c	146 ^c	174 ^c	189 ^c
			Female	4 500	142 ^c	13 ^c	110 ^c	122 ^c	141 ^c	166 ^c	180 ^c
39	6.3.11	Face length (menton-sellion)	Male								
			Female								
40	6.3.12	Head circumference	Male								
			Female								
41	6.3.13	Sagittal arc	Male								
			Female								
42	6.3.14	Bitracion arc	Male								
			Female								
43	6.3.15	Thumb length	Male								
			Female								
44	6.3.16	Thumb breadth	Male								
			Female								
45	6.3.17	Hand thickness	Male								
			Female								
46	6.3.18	Hand breadth including thumb	Male								
			Female								
47	6.3.19	Arm circumference flexed	Male								
			Female								
48	6.3.20	Forearm circumference flexed	Male								
			Female								
49 ^a	6.4.1	Wall-acromion distance	Male	8 025	102	18	60	73	100	133	145
			Female	4 500	99	17	54	69	100	128	137
50 ^{a,b}	6.4.2	Grip reach; forward reach	Male	8 025	723 ^b	58	567 ^b	630 ^b	721 ^b	816 ^b	860 ^b
			Female	4 500	664 ^b	52	539 ^b	572 ^b	665 ^b	750 ^b	776 ^b
51	6.4.3	Elbow-wrist length	Male								
			Female								

Table 20 (continued)

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
52 ^{a,b}	6.4.4	Elbow-grip length	Male	8 025	354 ^b	31	289 ^b	305 ^b	353 ^b	402 ^b	439 ^b
			Female	4 500	321 ^b	27	256 ^b	280 ^b	320 ^b	362 ^b	392 ^b
53 ^a	6.4.5	Fist (grip axis) height	Male	8 025	690	45	592	620	690	766	803
			Female	4 500	649	42	550	584	650	720	750
54	6.4.6	Forearm-fingertip length	Male	8 025	453	30	380	400	455	500	523
			Female	4 500	417	27	346	372	417	460	485
55 ^a	6.4.7	Buttock-popliteal length (seat depth)	Male	8 025	442	37	353	381	442	500	535
			Female	4 500	427	37	338	365	427	485	510
56 ^a	6.4.8	Buttock-knee length	Male	8 025	536	36	445	474	536	594	625
			Female	4 500	513	36	415	450	515	570	593
57	6.4.9	Neck circumference	Male								
			Female								
58	6.4.10	Chest circumference	Male	8 025	845	60	716	750	840	950	1 010
			Female	4 500	813	73	650	700	810	950	1 000
59	6.4.11	Waist circumference	Male	8 025	765	83	611	650	750	920	1 014
			Female	4 500	720	84	561	600	712	870	947
60	6.4.12	Wrist circumference	Male	8 025	160	11	136	142	160	178	187
			Female	4 500	148	11	120	130	150	166	175
61	6.4.13	Thigh circumference	Male	8 025	444	47	340	370	442	520	562
			Female	4 500	413	54	310	332	412	500	540
62	6.4.14	Calf circumference	Male	8 025	312	33	235	260	310	370	395
			Female	4 500	292	37	210	232	290	359	385
^a Definition is different from ISO 7250-1 or substituted. See Table 19 .											
^b Systematically smaller values due to different definitions.											
^c Unusual values. See 7.5 .											

8.13 Sweden

Organization: Swedish Institute for Standards (SIS)

Name of study: Proforma 3

Table 21 — Sweden: Database

1 Measurement		
1.1	Measured side (right/left)	Both sides were measured but no significant differences were found, therefore they are not reported separately.
1.2	Measurement definitions different from those described in ISO 7250-1	None
1.3	Substituted measurements	None
1.4	Number of measurements not described in ISO 7250-1	None
2 Age range		
2.1	Working age	18 to 65
2.2	Age range of participants	18 to 65
3 Background data		
3.1	Time period of measurement	2004 to 2006
3.2	Location of measurement	Lund and Malmö in the region of Skåne, southern Sweden.
3.3	Survey sample	61 to 262 females, 38 to 105 males, depending on the measurement item
3.4	Publication	Reference [19]
4 Representativeness of the sample		
4.1	Sampling method	Voluntary as well as systematic sampling to obtain a sample which mirrored the Swedish population regarding immigrants and annual disposable income.
4.2	Information on secular change	Compared to a study from 1969, there is an increase by 0,9 mm/year for females and 1,4 mm/year for males.
5 Accuracy and reliability of measurements		
5.1	Intra- and inter-observer error rates	Not noted
5.2	Measurements from 3D scanners	VITUS/Smart 3D with ScanWorX v2.7.2 software was used. ^a The accuracy of the scanning equipment is 0,3 %.
5.3	Other measurement not taken using instruments described in ISO 7250-1	Head circumference was measured with a soft measuring tape and the length and breadth with a calliper. The accuracy when using a measuring tape is ± 2 mm. Head length and breadth were measured with a calliper with an accuracy of ± 3 mm.
5.4	Type of clothing	Underwear
^a VITUS/Smart 3D and ScanWorX v2.7.2 are examples of suitable products available commercially. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of these products.		

Table 22 — Sweden: Statistical summary

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
		Age	Male	105	35,4	12,8		21	30	60	
			Female	262	38,0	13,4		21	35	62	
1	6.1.1	Body mass (weight), kg	Male	105	78	13		57	75	103	
			Female	262	65	11		50	64	80	
2	6.1.2	Stature (body height)	Male	105	1 792	70		1 669	1 779	1 902	
			Female	262	1 674	68		1 562	1 673	1 789	

Table 22 (continued)

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
3	6.1.3	Eye height	Male	105	1 665	68		1 562	1 657	1 778	
			Female	262	1 553	66		1 446	1 553	1 668	
4	6.1.4	Shoulder height	Male	105	1 454	66		1 333	1 459	1 548	
			Female	262	1 359	63		1 252	1 357	1 468	
5	6.1.5	Elbow height	Male	105	1 104	56		1 020	1 108	1 181	
			Female	262	1 042	52		957	1 044	1 130	
6	6.1.6	Iliac spine height, standing	Male	105	1 002	53		920	999	1 086	
			Female	262	933	52		843	934	1 018	
7	6.1.7	Crotch height	Male	38	803	56		693	810	899	
			Female	61	772	43		696	776	837	
8	6.1.8	Tibial height	Male	38	452	34		391	452	511	
			Female	61	407	25		359	406	451	
9	6.1.9	Chest depth, standing	Male	38	242	32		194	243	295	
			Female	61	191	17		162	190	220	
10	6.1.10	Body depth, standing	Male	38	251	45		186	241	343	
			Female	61	226	25		183	223	280	
11	6.1.11	Chest breadth, standing	Male	38	347	34		295	345	415	
			Female	61	303	24		256	304	342	
12	6.1.12	Hip breadth, standing	Male	38	363	28		309	362	403	
			Female	61	370	24		333	372	413	
13	6.2.1	Sitting height (erect)	Male	105	944	36		883	946	1 006	
			Female	262	892	35		832	892	949	
14	6.2.2	Eye height, sitting	Male	105	814	39		757	816	874	
			Female	262	766	33		710	762	820	
15	6.2.3	Cervical height, sitting	Male	38	675	37		592	678	737	
			Female	61	634	27		585	632	673	
16	6.2.4	Shoulder height, sitting	Male	105	608	33		557	607	668	
			Female	262	575	29		521	577	624	
17	6.2.5	Elbow height, sitting	Male	105	240	28		195	238	292	
			Female	262	238	27		192	238	285	
18	6.2.6	Shoulder-elbow length	Male	105	370	20		336	370	404	
			Female	262	341	20		304	341	376	
19	6.2.7	Shoulder (biacromial) breadth	Male	105	396	23		362	395	436	
			Female	262	357	19		327	356	388	
20	6.2.8	Shoulder (bideloid) breadth	Male	105	476	27		437	478	520	
			Female	262	425	23		390	425	467	
21	6.2.9	Elbow-to-elbow breadth	Male	38	536	59		423	535	628	
			Female	61	450	47		381	444	538	
22	6.2.10	Hip breadth, sitting	Male	38	391	35		326	387	445	
			Female	61	414	30		367	416	463	
23	6.2.11	Popliteal height, sitting	Male	38	486	32		437	491	534	
			Female	61	447	28		397	444	500	

Table 22 (continued)

No.	ISO 7250-1:2017			Sample size <i>n</i>	Mean	SD	P1	P5	P50	P95	P99
	Sub-clause	Measurement									
24	6.2.12	Thigh clearance	Male	105	157	16		129	158	184	
			Female	262	147	15		126	145	173	
25	6.2.13	Knee height, sitting	Male	105	554	31		505	556	603	
			Female	262	522	31		468	521	568	
26	6.2.14	Abdominal depth, sitting	Male	105	250	46		204	237	351	
			Female	262	235	38		191	227	317	
27	6.2.15	Thorax depth	Male	105	248	31		198	246	294	
			Female	262	238	37		176	241	295	
28	6.2.16	Buttock-abdomen depth, sitting	Male	38	262	62		171	259	362	
			Female	61	258	39		206	253	345	
29	6.3.1	Hand length (stylion)	Male	105	194	9		178	194	211	
			Female	262	179	9		165	179	195	
30	6.3.2	Palm length	Male								
			Female								
31	6.3.3	Hand breadth at metacarpals	Male	105	87	5		80	86	97	
			Female	262	78	5		71	78	87	
32	6.3.4	Index finger length	Male								
			Female								
33	6.3.5	Index finger breadth, proximal	Male								
			Female								
34	6.3.6	Index finger breadth, distal	Male								
			Female								
35	6.3.7	Foot length	Male	105	266	14		247	266	288	
			Female	262	243	12		224	243	264	
36	6.3.8	Foot breadth	Male	105	101	6		92	101	112	
			Female	262	92	5		84	91	101	
37	6.3.9	Head length	Male	105	200	8		185	200	210	
			Female	262	189	8		178	190	200	
38	6.3.10	Head breadth	Male	105	154	7		144	155	165	
			Female	262	147	5		140	146	155	
39	6.3.11	Face length (menton-sellion)	Male								
			Female								
40	6.3.12	Head circumference	Male	105	581	16		551	581	605	
			Female	262	556	14		535	555	578	
41	6.3.13	Sagittal arc	Male								
			Female								
42	6.3.14	Bitragion arc	Male								
			Female								
43	6.3.15	Thumb length	Male								
			Female								
44	6.3.16	Thumb breadth	Male								
			Female								