Supplementary Information for

Sex Estimation in the Egyptian Old Kingdom Population (c. 2700–2180 BCE) using Logistic Regression

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Sex Estimation Calculator for Old Kingdom samples (©SECOK_2025) - caption

Other Supplementary Information for this manuscript includes the following:

Data S1
Sex Estimation Calculator for Old Kingdom samples (©SECOK_2025)

Table S1: Overview of the cranial measurements included in the analysis

Measurement	code 1	code 2	database code
Maximum cranial length (g-op)	M1	1	M01
Cranial base length (ba-n)	M5	5	M05
Maximum cranial breadth (eu-eu)	M8	2	M08
Minimum frontal breadth (ft-ft)	M9	11	M09
Maximum frontal breadth (co-co)	M10		M10
Biauricular breadth (au-au)	M11	9	M12
Biasterionic breadth (ast-ast)	M12		M11
Height of the skull (ba-b)	M17	4	M17
Horizontal circumference (g ∩ op ∩ g)	M23		M23
Transversal arc (po ∩ b ∩ po)	M24		M24
Medio-sagittal arc (n ∩ o)	M25		M25
Frontal sagittal arc (n∩b)	M26		M26
Parietal sagittal arc (b∩l)	M27		M27
Occipital sagittal arc (l∩o)	M28		M28
Frontal chord (n-b)	M29	19	M29
Parietal chord (b-l)	M30	20	M30
Occipital chord (l-o)	M31	21	M31
Facial length (ba-pr)	M40	6	M40
Upper facial breadth (fmt-fmt)	M43	12	M43
Biorbital breadth (ec-ec)	M44	17	M44
Bizygomatic breadth (zy-zy)	M45	3	M45
Mid-facial (bimaxillary) breadth (zm-zm)	M46		M46
Facial height (n-gn)	M47		M47
Upper facial height (n-pr)	M48	10	M48
Interorbital breadth (d-d, mf-mf)	M50	18	M50
Orbital breadth (mf-ek, d-ec) - bilateral	M51	15	M51
Orbital height (spa-sbk) - bilateral	M52	16	M52
Nasal breadth (al-al)	M54	14	M54
Nasal height (n-ns)	M55	13	M55
Maxilloalveolar length (pr-alv)	M60	8	M60
Maxilloalveolar breadth (ecm-ecm)	M61	7	M61
Internal palatal length (ol-sta)	M62		M62
Internal palatal breadth (enm-enm)	M63		M63
Bicondylar breadth (cdl-cdl)	M65	29	M65
Bigonial breadth (go-go)	M66	28	M66
Chin height (id-gn)	M69	25	M69
Maximum ramus height - bilateral	M70	32	M70
Minimum ramus breadth - bilateral	M71	30	M71

Code 1: definition of measurement according to Martin & Saller, 1957 and/or Knussman, 1988; code 2: definition of dimensions according to Buikstra & Ubelaker , 1994; *statistically significant bilateral asymmetry at p=0,05 level

Table S2: Overview of the postcranial measurements included in the analysis

Bone	Measurement	Code 1	Code 2	database code
Scapula	Height (anatomical breadth)	Sc1	38	Sc1
	Breadth (anatomical length)	Sc2	39	Sc2
	Glenoid maximum height	Sc12		Sc12
	Glenoid maximum breadth*	Sc13		R_Sc13
Clavicle	Maximum length	Cl1	35	Cl1
	Superor-inferior midshaft diameter	Cl4	37	Cl4
	Anterior-posterior midshaft diameter	Cl5	36	Cl5
	Circumference at midshaft	Cl6		Cl6
Humerus	Maximum length*	H1	40	R_H1
	Physiological length*	H2		R_H2
	Proximal epiphysis breadth*	H3		R_H3
	Epicondylar breadth*	H4	41	R_H4
	Maximum midshaft diameter	H5	43	H5
	Minimum midshaft diameter	H6	44	H6
	Minimum shaft circumference*	H7		R_H7
	Head circumference*	H8		R_H8
	Transversal head diameter	H9		H9
	Vertical head diameter	H10	42	H10
Radius	Maximum length*	R1	45	R_R1
	Physiological length*	R1b		R_R1b
	Maximum shaft diameter *	R4		R_R4
	Transverse diameter at midshaft*	R4a	47	R_R_47_ML_diam_midshaft
	Anterior-posterior shaft diameter	R5		R5
	Anterior-posterior diameter at midshaft	R5a	46	R_46_AP_diam_midshaft
	Distal epiphysis breadth	R5(6)		R5_6
Ulna	Maximum length	U1	48	U1
	Antero-posterior shaft diameter*	U11	49	R_U11
	Transverse shaft diameter	U12	50	U12
Femur	Maximum length*	F1	60	R_F1
	Bicondylar length	F2	61	F2
	Anterior-posterior midshaft diameter	F6a	66	F6a
	Transverse midshaft diameter*	F7a	67	R_F7a
	Upper transverse shaft diameter*	F7b		R_F7b
	Upper antero-posterior shaft diameter	F7c		F7c
	Lower transverse shaft diameter	F7d		F7d
	Lower antero-posterior shaft diameter	F7e		F7e
	Midshaft circumference	F8	68	F8
	Transverse subtrochanteric diameter*	F9	65	R_F9
	Anterior-posterior substrochanteric diameter	F10	64	F10

Bone	Measurement	Code 1	Code 2	database code
Femur	Proximal epiphysis length*	F13		R_F13
	Epicondylar breadth	F21	62	F21
	Vertical head diameter*	F18		R_F18
	Transversal head diameter	F19		F19
	Maximum head diameter		63	F_63_max_head_diam
Tibia	Maximum length	T1a		T1
	Medial total length	T1b		T1b
	Maximum proximal epiphyseal breadth	T3	70	T3
	Maximum distal epiphyseal breadth	T6	71	T6
	Maximum midshaft diameter	T8		T8
	Maximum diameter at nutrient foramen	T8a	72	T8a
	Minimum midshaft diameter	T9		T9
	Transverse diameter at nutrient foramen*	T9a	73	R_T9a
	Circumference at nutrient foramen	T10a	74	T_74_circum_nutr_for
Fibula	Maximum length*	Fi1	75	R_Fi1
	Maximum diameter at midshaft*		76	R_Fi_76_max_diam_midshaft
Patella	Maximum height	Pt1		Pt1
	Maximum breadth	Pt2		Pt2
	Maximum thickness	Pt3		Pt3
Talus	Physiological length	Ta1		Ta1
	Maximum length	Ta1a		Ta1a
	Maximum breadth	Ta2		Ta2
	Maximum height	Ta3a		Ta3a
Calcaneus	Maximum length*	Ca1a	77	R_Ca1a
	Middle breadth	Ca2	78	Ca2
Sacrum	Anterior length	S2	53	S2
	Anterior superior breadth	S5	54	S5
	Anterior-posterior base diameter	S18		S18
	Maximum transverse base diameter	S19	55	S19

Code 1: definition of measurement according to Martin & Saller, 1957 and/or Knussman, 1988; code 2: definition of dimensions according to Buikstra & Ubelaker, 1994; *statistically significant bilateral asymmetry at p=0.05 level

Data S1 - caption:

Complete results of 2D and 3D logistic regression models for all selected measurements. The left side summarizes the estimated factors of the given measurements in the model and the middle side illustrates the model performance. The right side of the table facilitates filtering and contains information about the number of dimensions used for the model in the categories of skull, upper limb, lower limb.

Legend: a^j: regression coefficient; a^0: constant (intercept); T: absolute number and C (%): percentage of individuals with all model features available; A_{50}train and A_{50}test: the standard accuracy on the training and test set respectively; E_{95} : total number of errors in the sex category of certainly males or certainly females; E_{85}: total number of errors in the both categories of certainly males/females and probably males/females; R_{95}: the percentage of individuals that were identified in the category of certainly males/females; p: p-value of the model. For description of the measurements see Table 3.

Sex Estimation Calculator for Old Kingdom samples (©SECOK_2025) – caption

The Excel file contains four sheets:
1. Calculator:
A calculator with unlocked cells for data input and automatic calculation of sex estimation equations.
Legend: Score: discriminant score (z); Probability M: probability of being male; 5-level: result of five-level categorisation (M: certainly male, pM: probably male, ND: non-defined, F: certainly female, pF: probably female); 2-level: result of two-level categorisation (M: male, ND: non-defined, F: female).

2. Measurement definition:
Overview and definition of the 26 final cranial and postcranial measurements selected for the calculation of logistic regression models
Corresponds to Table 3 in the main publication.

3. Case male:
Case study for males: results of calculations using sex estimation equations for specific male individual 120/AS68b/2012_c (Shepespuptah).

4. Case female:
Case study for females: results of calculations using sex estimation equations for specific female individual 30/AS51/2009.