Ethnic Androgen Differentials

Total Testosterone (T), Free Testosterone (cFT) and Total Estrone (E_1)

It is a claim by human biodiversity (HBD) advocates that African males are the most bestial because they have more testosterone and East Asian males are the most feminine because they have the least testosterone. ***Implicit in this is that the European is the one and only truly masculine (hu)man***. This claim is simplistic because testosterone in and of itself is not enough to effect psycho-physical change on the human body because of sex binding globulins (SBG) which bind to sex hormones (other substances do as well) and decrease the effective testosterone value. To this end, this will analyze circulating (or effective) free testosterone (*cFT*) as well. ***Even this is problematic as free testosterone does not tell you much about the level of bio-available testosterone***. Also included is the so-called female hormone estrone (E_1) which will be used to investigate if East Asian males have more feminizing hormones. The table below lists over **150** ***peer-reviewed medical journal articles***, none of which were cherry-picked.

Table 1: Ethnic Plasma Sex Hormone Variation

Country (ethnicity), sample size [comment]	Mean Age (SD) [yrs]	Total *t* (SD) [ρg/mL]	*cFT* (SD) [ρg/mL]	Total E_1 (SD) [ρg/mL]	Source [comment]
CANADA & USA					
Canada (European), 77 Canada (South Asian), 78	49.7 [med] 46.1 [med]	4416 3752	n/a n/a	n/a n/a	Zimmerman et al. (2009)
Canada (?), 771	36.7 (11.9)	6085 (2070)	13.7 (4.7)	n/a	Kingston et al. (2012)
Canada (Metis/Native), 68 Canada (European), 126	15-17 15-17	6636 (1704) 5855 (1626)	n/a n/a	n/a n/a	Brooks & Reddon (1996)
Canada (Metis/Native), 53 Canada (European), 192	31.0 (8.3) 35.4 (7.6)	7794 (2078) 6293 (1876)	218 (47) 182 (31)	n/a n/a	Studer, Reddon & Siminoski (1997)
USA (African), 68 USA (European), 448	75 (8) 77 (7)	6480 (1723) 7392 (921)	n/a n/a	n/a n/a	Morgans et al. (2012)
USA (European), 1709 [11] USA (European), 1709 [11]	55.2 (8.7) 62.7 (8.3)	5200 (1800) 4500 (1600)	97 75	42 (20) 33 (21)	Feldman et al. (2002)
USA (African), 357 USA (European), 618	34 34	6927 6117	n/a n/a	n/a n/a	Tsai et al. (2006)
USA (African), 97 USA (European), 227	34 (12) 36 (15)	4359 (1616) 4214 (1703)	n/a n/a	n/a n/a	Ukkola et al. (2001)
USA (European), 1407 USA (European), 1887 USA (European), 618	61.1 (9.5) 40.3 (8.8) 59.1 (9.3)	5859 (2268) 6461 (2245) 6494 (2386)	87 (32) 125 (45) 92 (32)	n/a n/a n/a	Bhasin et al. (2011a)
USA (European), 456	19-40	7238 (2211)	141.8 (45)	n/a	Bhasin et al. (2011b)
USA (African), 49 USA (European), 47	20.1 (0.2) 19.3 (0.2)	6400 5750	n/a n/a	n/a n/a	Ross et al. (1992)
USA (African), 50 USA (European), 50	19.9 (1.3) 20.6 (1.4)	6605 5569	166 137	36.7 31.6	Ross et al. (1986) [1]
USA (African), 10 USA (European), 26	63 66	3300 4100	n/a n/a	n/a n/a	Asbell et al. (2000)
USA (African), 43 USA (Asian), 52 USA (European), 55	n/a n/a n/a	4600 (1200) 4400 (1200) 4700 (1500)	n/a n/a n/a	n/a n/a n/a	Platz et al. (2000) [1]
USA (African), 482 USA (European), 692 USA (African), 483	24 34	6500 (2000) 6400 (2000) 5800 (2000)	170 170 160	n/a n/a n/a	Gapstur et al. (2002) [2]

USA (European), 695		5690 (1800)	150	n/a	
USA (African), 363 USA (European), 674 USA (Mexican), 376	20+	5110 5250 4950	101 103 101	n/a n/a n/a	Rohrmann et al. 2007 [1]
USA (African), 122 USA (European), 176 USA (African), 67 [3] USA (European), 88 [3]	n/a n/a n/a n/a	4243 3802 3866 4195	n/a n/a n/a n/a	n/a n/a n/a n/a	Kubricht et al. (1999)
USA (African), 276 USA (Hispanic), 327 USA (European), 373	46.5 (12) 44.3 (11) 47.2 (13)	4731 (2077) 4207 (1598) 4296 (1677)	96 (39) 91 (36) 89 (34)	25.6 (9.9) 23.0 (9.1) 23.1 (9.0)	Araujo et al. (2008)
USA (African), 530 USA (Hispanic), 649 USA (European), 706	30-79 30-79 30-79	4440 (1970) 4410 (1890) 4320 (1750)	92 (41) 95 (41) 89 (36)	n/a n/a n/a	Kupelian et al. (2008)
USA (95.5% European), 579	58.0 (8.6)	5246 (1721)	118 (44)	n/a	Lakshman, Bhasin & Araujo (2010)
USA (95+% European), 224 USA (95+% European), 285 USA (95+% European), 229 USA (95+% European), 53	40-49 50-59 60-69 70-79	5398 (1761) 4994 (1732) 5023 (1616) 4243 (1559)	143 (53) 119 (47) 104 (38) 76 (34)	n/a n/a n/a n/a	Mohr et al. (2005)
USA (European), 66	50.9 63.8	7510 (2480) 7100 (3310)	n/a n/a	n/a n/a	Zmuda et al. (1997)
USA (Mohawk), 257	44.3 (0.9)	5240 (1660)	n/a	n/a	Goncharov et al. (2009)
USA (97% European), 1096	53.9 (8.3)	5240 (1720)	99 (39)	n/a	Stellato et al. (2000)
USA (Japanese), 110	63.7 (5.5)	4844 (1299)	n/a	n/a	Tsai et al. (2000)
USA (Japanese), 98	n/a	4309 (1785)	n/a	31.3 (10.9)	Nomura et al. (1988)
USA (Africa), 54 USA (Africa), 69	56.2 (4.6) 56.0 (4.2)	4867 (1939) 4106 (1824)	n/a n/a	n/a n/a	Haren et al. (2007)
USA (European), 12 USA (European), 10 USA (European), 8	56.5 (0.7) 55.3 (1.2) 55.8 (1.3)	4880 (310) 5380 (410) 6650 (640)	n/a n/a n/a	n/a n/a n/a	Howie & Shultz (1985)
EAST ASIA					
Japan (Japanese), 251	20s 30s 40s 50s 60s 70s	4700 4200 4400 4200 4200 4000	17 15 13 11 9 9	n/a n/a n/a n/a n/a n/a	Sato et al. (2006) [0]
Japan (Japanese), 274	46 (11)	n/a	14.0 (4.6)	n/a	Katabami et al. (2010)
Japan (Japanese), 54	23.1 (0.3)	6020	n/a	n/a	Ross et al. (1992)
Japan (Japanese), 256	60.5 (10.7)	4320 (1370)	14.3 (4.3)	19.4 (9.2)	Nagata et al. (2000)
Japan (Japanese), 792	20-45	5773 (2020)	120 (41)	n/a	Iwamoto et al. (2013)
Japan (Japanese), 187	46-64	5500	116.1	n/a	Kawa et al. (2008)
Japan (Japanese), 47	50+	4500 (1100)	n/a	n/a	Tsujimura et al. (2005)
Japan (Japanese), 1120	40-79	5130 (3260)	77.0 (43.4)	n/a	Okamura, Ando & Shimokata (2005)
China (Chinese), 50	43.7 (1.4)	4413 (173)	n/a	n/a	Jin et al. (2000)
China (Chinese), 402 China (Chinese), 76 [4]	45-64 45-64	4850 5700	n/a n/a	n/a n/a	Yuan et al. (1995)
China (Chinese), 1080	20 30-40 50 60 70	5720 6224 5826 6046 5991	127 118 107 101 87	n/a n/a n/a n/a n/a	Li et al. (2005)
China (Chinese), 14	21-45	3740 (190)	n/a	n/a	Jiang et al. (2003)
China (Chinese), 20	37.7 (1.1)	4788	63	n/a	Wang et al. (2006)
China (Chinese), 210	46 (1)	4820 (115)	n/a	n/a	Jin et al. (1999)
China (Chinese), 109 [12] China (Chinese), 98	37.8 (8.3) 43.1 (8.8)	5282 5311	n/a n/a	n/a n/a	Tong et al. (2005)
China (Chinese), 60	59.4 91.4)	6114 (492)	n/a	n/a	Zheng et al. (2012)
China (Chinese), 1776	20-30 31-40 41-50 51+	6928 [est.] 5773 [est.] 5773 [est.] 5773 [est.]	139 [est.] 115 [est.] 107 [est.] 98 [est.]	n/a n/a n/a n/a	Liao et al. (2012)

China (Chinese), 1182	72.4 (5.0)	5500 (2100)	n/a	n/a	Jiang et al. (2010)
China (Chinese), 175	68.5 (5.4)	5860	81	n/a	Wang, Wang & Li (2007)
China (Chinese), 49 China (Chinese), 91 China (Chinese), 175 China (Chinese), 82 China (Chinese), 44 China (Chinese), 33	18-29 30-39 40-49 50-59 60-69 70-89	5917 (1847) 5282 (1386) 5109 (1674) 5311 (1328) 5513 (1386) 4820 (1963)	n/a n/a n/a n/a n/a n/a	n/a n/a n/a n/a n/a n/a	Chu et al. (2008)
China (Chinese), 26	22.3 (2.4)	5427 (981)	n/a	n/a	Wu et al. (2009)
China (Chinese), 175	68.5 (5.4)	5860	80.8	n/a	Wu et al. (2011)
China (Chinese), 59 China (Chinese), 32	57.6 (7.2) 57.6 (7.2)	6899 (2251) 6495 (2511)	n/a n/a	n/a n/a	Mo et al. (1995)
Hong Kong (Chinese), 1489	72.5	5470	106	n/a	Auyeung et al. (2011)
Taiwan (Chinese), 245 Taiwan (Chinese), 130 Taiwan (Chinese), 66 Taiwan (Chinese), 29	40-49 50-59 60-69 70-79	5060 (1390) 4900 (1500) 4860 (1500) 4420 (1810)	11.0 (0.3) 9.2 (0.3) 7.8 (0.3) 7.5 (0.6)	n/a n/a n/a n/a	Hwang et al. (2006)
S. Korea (Korean), 1139	19 – 27	6230	n/a	n/a	Bahk et al. 2010
S. Korea (Korean), 74	21-39	4157 (1328)	n/a	n/a	Jakobsson et al. (2006)
S. Korea (Korean), 626 S. Korea (Korean), 136	54.6 (9.8) 56.8 (7.7)	5310 (1880) 4960 (1430)	n/a n/a	n/a n/a	Kang et al. (2003)
S. Korea (Korean), 244	55 (10)	4830	n/a	n/a	Kim et al. (2012)
S. Korea (Korean), 20	26-36	5270 (1140)	n/a	n/a	Seo et al. (2006)
S. Korea (Korean), 2461	62.6 (7.7)	5850 (2420)	79 (28)	n/a	Kweon et al. (2012)
S. Korea (Korean), 85 S. Korea (Korean), 35 [3]	69.0 (7.5) 70.7 (7.0)	4523 (1546) 4581 (1588)	n/a	n/a	Koo and Shim (2010)
S. Korea (Korean), 63 S. Korea (Korean), 145	15-19 20-24	4330 (404) 5629 (404)	n/a	n/a	Kim et al. (2005)
S. Korea (Korean), 285	68.8 (8.8)	5200 (1400)	n/a	n/a	Shin et al. (2010)
Thailand (Thai), 37	19-23	5378 (1435)	20 (4)	n/a	Hiruntrakul et al. (2010) [5]
Thailand (Thai), 81	52.9 (1.8)	n/a	22.8 (0.6)	n/a	Ongphiphadhanakul et al. (1998)
Philippines (Filipino), 612 Philippines (Filipino), 484 [16]	21.5 (0.3) 21.5 (0.3)	7900 8100	n/a	n/a	Gettler, McDade & Kuzawa (2011)
Malaysia (Chinese), 90 Malaysia (Malay), 99	30.1 (5.7) 25.6 (5.5)	3266 (1083) 3452 (1083)	121 (35) 124 (35)	n/a n/a	Chin et al. (2012a)
Malaysia (Chinese), 309 Malaysia (Malay), 240	46.8 (13.1) 45.3 (17.4)	5415 (1844) 5536 (2003)	n/a n/a	n/a n/a	Chin et al. (2012b)
SOUTH ASIA					
India (Indian), 50	37-76	3502 (1742)	n/a	n/a	Khan, Kant & Samaria (2012)
India (Indian), 60	30-85	6373 (3207)	n/a	n/a	Seth et al. 2011
India (Indian), 10	n/a	4766 (228)	n/a	n/a	Sewdarsen, Jialal & Naidu (1988)
India (Indian), 48 India (Indian), 47 India (Indian), 23 India (Indian), 3	50-59 60-69 70-79 80+	10530 7190 6690 9000	13.54 12.06 10.92 21.53	n/a n/a n/a n/a	Baruah et al. (2012) [14]
India (Indian), 35	31-35	5010 (1310)	n/a	n/a	Reddy et al. (2004)
India (Indian), 160	38.3 (6.3)	9360 (120)	n/a	n/a	Kulkarni et al. (2009)
India (Gujarati), 79	52.1	6264	109	n/a	Heald et al. (2007)
Pakistan (Pakistani), 50	20-55	4584 (332)	n/a	n/a	Khan et al. (2007)
Pakistan (Pakistani), 50	20-55	4991 (294)	n/a	n/a	Khan et al. (2008)
Bangladesh (Bangladeshi), 93	63.3 (0.8)	4107 (199)	n/a	n/a	Ansari, Begum & Islam (2008)
Iran (Iranian), 15	35.5 (2.7)	4950 (840)	n/a	n/a	Khorshidi et al. (2012)
Iran (Iranian), 30	20-40	7350 (1420)	n/a	n/a	Hashemi, Sarasgani & Zomorodian (2004)
Iran (Iranian), 46	35.1 (7.3)	8147 (1533)	n/a	n/a	Hejazian, Dashti & Rafati (2007)
Iran (Iranian), 52	18+?	3930 (1090)	n/a	n/a	Salsabili et al. (2011)
Iran (Iranian), 13	18.9 (1.7)	1686 (699)	n/a	n/a	Hejazi & Hosseini (2012)

Iran (Iranian), 388 Iran (Iranian), 114	57.0 (10.5) 52.9 (11.4)	4792 (1922) 4566 (2096)	6.7 (3.2) 7.1 (3.6)	n/a n/a	Fallah et al. (2009)
EUROPE					
Finland (Finn), 703	51.3 (6.7)	5888 (1992)	87.7 (21.6)	n/a	Laaksonen et al. (2004)
Finland (Finn), 1551	52.5 (5.7)	6230 (2134)	89 (22)	n/a	Laaksonen et al. (2003)
Finland (Finn), 3271	25-29 60-69 70-74	7303 3983 4878	n/a n/a n/a	n/a n/a n/a	Perheentupa et al. (2012)
Finland (Finn), 204	60.5 (5.1)	5958 (595)	n/a	43.5 (2.7)	Hartman et al. (2000)
Netherlands (Dutch), 100 Netherlands (Dutch), 100 Netherlands (Dutch), 100 Netherlands (Dutch), 99	40-50 51-60 61-70 71-80	5826 (1612) 5336 (1506) 5163 (1595) 5134 (1246)	n/a n/a n/a n/a	n/a n/a n/a n/a	de Ronde et al. (2005)
Netherlands (Dutch), 403	77.8 (3.6)	2549 (860)	8.7 (2.9)	27.7 (10.6)	van den Beld et al. (2000)
Netherlands (Dutch), 445	68.0 (7.8)	3262 (1068)	n/a	n/a	van Noord et al. (2010)
Poland (Polish), 1428	49.1 (16.0)	4907 (1703)	n/a	n/a	van Noord et al. (2010)
Italy (Italian), 1113	20-69	4880 [med.]	n/a	n/a	Rochira et al. (2011)
Italy (Italian), 389	65+	4330 (1290)	38 (22)	n/a	Maggio et al. (2006)
Sweden (Swedish), 3014	75.4 (3.2)	4500 (1870)	80 (34)	34.3 (15.0)	Mellström et al. (2008)
Sweden (Swedish), 84	47-74	3461	78	n/a	Carrero et al. (2009)
Sweden (Swedish), 122	18-20	5196 (1530)	n/a	n/a	Jakobsson et al. (2006)
Sweden (Swedish), 1317 Sweden (Swedish), 844 Sweden (Swedish), 123	18-90 18-90 18-90	4350 (1700) 4750 (1770) 5260 (1710)	n/a n/a n/a	n/a n/a n/a	Ohlsson et al. (2011)
Sweden (Swedish), 1068	18.9 (0.6)	4690 (1520)	130 (40)	22.6 (7.7)	Swanson et al. (2007)
Sweden (Swedish), 184	47	3464 [med]	72.2	n/a	Bonefeld-Jorgensen et al. (2006), Giwercman et al. (2006)
Norway (Norwegian), 1454	59.4 (10.3)	3868 (1501)	59.5 (21.8)	n/a	Vikan et al. (2010)
Norway (Norwegian), 2290	66 (9.3)	4012 (1588)	70.7 (26.8)	n/a	Vikan et al. (2009)
UK (English), 46 UK (English), 137 UK (English), 207 UK (English), 123 UK (English), 110 UK (English), 29	20-29 30-39 40-49 50-59 60-69 70+	6726 5917 6091 5744 5715 5888	152 125 122 109 98 95	n/a n/a n/a n/a n/a n/a	Allen et al. (2002)
UK (English), 266 UK (English), 273 UK (English), 83	n/a n/a n/a	5831 6061 5946	124 124 121	n/a n/a n/a	Allen, Forrest & Key (2001)
UK (European), 67 UK (South Asian), 67	28.9 (5.2) 30.7 (4.8)	5875 5225	127 124	n/a n/a	Biswas et al. (2010)
U.K. (African), 75 U.K. (European), 55 U.K. (Pakistani), 50	n/a n/a n/a	5192 5394 4903	132 131 106	n/a n/a n/a	Heald et al. (2003)
U.K. (Gujarati), 97	46.7	4965	112	n/a	Heald et al. (2007)
U.K. (European), 141	35.0 (9.4)	4561 (1616)	151 (132)	n/a	Spector et al. (1989)
Europe (European), 15 Europe (European), 230 Europe (European), 262 Europe (European), 64	40-49 50-59 60-69 70-79	4618 4387 4647 4763	90.3 80.5 77.1 73.6	n/a n/a n/a n/a	Suzuki et al. (2009) [10]
France (French), 325	40-49 50-59 60-69	5074 4823 4705	n/a n/a n/a	25 29 28	Giton et al. (2011)
France (French), 503	20-74	4734	n/a	n/a	Giton et al. (2007)
Germany (German), 50 Germany (German), 50	21-30 70+	5715 3291	130 52	n/a n/a	Elmlinger et al. (2003)
Germany (German), 334 Germany (German), 457	19.7 (1.9) 18.9 (1.4)	6697 (2684) 6812 (3031)	n/a n/a	n/a n/a	Paasch et al. (2008)

Germany (German), 117 Germany (German), 132 Germany (German), 126 Germany (German), 190 Germany (German), 89 Germany (German), 18	20-29 30-39 40-49 50-59 60-69 70-80	6483 (1720) 5903 (1634) 5259 (1328) 4783 (1287) 4099 (1221) 3940 (999)	20.9 (7.3) 18.2 (6.0) 16.1 (5.3) 13.8 (4.5) 11.2 (3.8) 10.0 (4.1)	n/a n/a n/a n/a n/a n/a	Leifke et al. (2000)
Denmark ([13]), 881	19.5 (1.3)	5484 (1732)	n/a	n/a	Joensen et al. (2012)
Belgium (Belgian), 218 Belgium (Belgian), 152	74 78	4440 (1430) 4140 (1480)	74 (20) 69 (21)	n/a n/a	Lapauw et al. (2008)
Belgium (Belgian), 42 Belgium (Belgian), 115	26.5 78	6437 (1876) 5946 (3146)	n/a n/a	n/a n/a	Mahmoud et al. (2003)
Poland (Polish), 113 Ukraine (Ukrainian), 194	31 27	3752 [med] 5196 [med]	83.7 112.6	n/a n/a	Bonefeld-Jorgensen et al. (2006), Giwercman et al. (2006)
Greece (Greek), 51	71.7 (4.6)	5418 (1944)	n/a	n/a	Signorello et al. (1997)
Greenland (Inuit), 258	31	4330 [med]	86.6	n/a	Bonefeld-Jorgensen et al. (2006), Giwercman et al. (2006)
AFRICA					
Nigeria (Nigerian), 170	61.0 (10.7)	6379 (2107)	n/a	n/a	Ogbera et al. (2011)
Nigeria (Nigerian), 40	45 (14)	9000 (2800)	n/a	n/a	Usoro, Agukpaha & Nsonwu (2005)
Nigeria (Nigerian), 30	37-46	7023 (242)	n/a	n/a	Eniola et al. (2012)
Nigeria (Nigerian), 33	56.4 (1.5)	5110 (350)	n/a	n/a	Umoh, Charles-Davies & Adeleye (2010)
Nigeria (Nigerian), 20 Nigeria (Nigerian), 48	38.2 (2.4) 37.4 (5.2)	5580 (300) 5680 (300)	n/a	n/a	Emokpae et al. (2006)
Nigeria (Nigerian), 40	54.2	3200	n/a	n/a	Etawo, Ekeke & Miaba (2012)
Nigeria (Nigerian), 50 Nigeria (Nigerian), 50	17-45 55-70	9583 (5305) 7216 (1755)	n/a n/a	n/a n/a	Amballi et al. (2007)
South Africa (African), 40	30-39	4878 (1357)	n/a	n/a	Bornman & Reif (2002)
South Africa (European), n/a South Africa (European), 83 South Africa (European), n/a	20-29 30-39 40-49	4214 (1414) 4012 (1559) 3291 (1472)	n/a n/a n/a	n/a n/a n/a	Bornman et al. (2000)
South Africa (African), 98 [17] South Africa (African), 52 [17] South Africa (African), 35 [17] South Africa (African), 137 [17] South Africa (African), 42 [17]	45.8 (1.7) 36.1 (1.5) 31.8 (2.4) 40.4 (1.3) 33.2 (1.3)	4930 (220) 4860 (410) 4670 (300) 5240 (190) 6230 (470)	n/a n/a n/a n/a n/a	n/a n/a n/a n/a n/a	Gray et al. (2006)
Kenya (Ariaal), 118	22 – 96	n/a	51 (22)	n/a	Campbell et al. (2003)
Zimbabwe (Zimbabwe), 105	20 – 78	n/a	57 (28)	n/a	Lukas et al. (2004)
LATIN AMERICA					
Brazil (Brazilian), 1623	24-87	5755	n/a	n/a	Nardozza Jr. et al. (2011)
Brazil (76% European), 186	64.5 (6.7)	4134 (1426)	n/a	n/a	Schmitt, Rhoden & Almeida (2011)
Brazil (80% EU, 20% AF), 630	57.1 (11.1)	5265 (1764)	17.3 (5.8)	n/a	Rhoden et al. (2005)
Brazil (88% EU, 12% AF), 11 Brazil (88% EU, 12% AF), 470 Brazil (88% EU, 12% AF), 334 Brazil (88% EU, 12% AF), 131 Brazil (88% EU, 12% AF), 19	40-49 50-59 60-69 70-79 80+	5032 (1949) 5277 (1867) 5364 (1881) 5545 (2014) 4248 (1954)	n/a n/a n/a n/a n/a	n/a n/a n/a n/a n/a	Rhoden et al. (2002)
Brazil (Brazilian), 20	36.7 (9.8)	4920 (730)	25.8 (6.2)	n/a	Lima et al. (2000)
Bolivia (Aymara), 17 Bolivia (Aymara), 22	27 57	n/a n/a	81 70	n/a n/a	Beall et al. (1992)
Trinidad & Tobago (African), 472	72.2 (6.0)	4600 (2000)	87 (33)	42.2 (15.5)	Miljkovic et al. (2011)
Guadeloupe (African), 304	40-49 50-59 60-69	5894 5095 5144	n/a n/a n/a	37 41 43	Giton et al. (2011)
Mexico (Mexican), 22	18+?	6840	n/a	n/a	Barberia, Giner & Cortes-Gallegos (1973)
Peru (Peruvian), 52	36.1 (1.1)	4623 (215)	n/a	n/a	Gonzales et al. (2012)
AUSTRALASIA					

Australia (Chinese), 47 Australia (European), 116	48 (2) 43 (1)	4272 (231) 4387 (144)	n/a n/a	n/a n/a	Jin et al. (1999)
Australia (European), 225	35 (5)	5196 (1732)	n/a	n/a	Stewart et al. (2009)
Australia (European), 50	47.9 (1.3)	4070 (173)	n/a	n/a	Jin et al. (2000)
Australia (European), 492	58.6 (15.0)	4012 (1386)	89.5 (27.7)	n/a	Yeap et al. (2009)
New Zealand (European), 11	54.7	5600 (346)	167	n/a	Reid et al. (1985)
MIDDLE EAST					
Kuwait (Arab), 49 Kuwait (Arab), 59 Kuwait (Arab), 53 Kuwait (Arab), 59 Kuwait (Arab), 66 Kuwait (Arab), 34 Kuwait (Arab), 7	15-19 20-29 30-39 40-49 50-59 60-69 70-79	3929 (1948) 4540 (2529) 3703 (1602) 3868 (1761) 3594 (1715) 3117 (2436) 2780 (1836)	n/a n/a n/a n/a n/a n/a n/a	n/a n/a n/a n/a n/a n/a n/a	Kehinde et al. (2006)
Egypt (Egyptian), 15 Egypt (Egyptian), 15 Egypt (Egyptian), 15	50-60 61-70 71-85	11850 (1300) 10800 (1500) 9600 (1570)	51.8 (4.5) 44.1 (3.3) 36.7 (6.9)	n/a n/a n/a	Enany et al. (2003)
Egypt (Egyptian), 15	18+	14110 (2120)	n/a	n/a	Abdullah & Bakry (2008)
Egypt (Egyptian), 30	30.9 (8.8)	5430 (1770)	n/a	n/a	Hanafy et al. (2007)
Jordan (Arab), 50	33.0 (0.9)	3675 (218)	n/a	n/a	Al-Daghistani et al. (2010)
Jordan (Arab), 111 Jordan (Arab), 93	15-45	5216 (577) 4673 (779)	n/a n/a	n/a n/a	Al-Matubsi et al. (2011)
Yemen (Arab), 10	n/a	7070 (650)	n/a	n/a	Kotb-El-Sayed & Al-Shoaibi (2012)
UAE (Arab), 11	71.2 (4.2)	5109 (664)	n/a	n/a	Al Attia, Jaysundaram & Saraj (2010)
Turkey (Turk), 16	41 (9)	n/a	69 (3.1)	n/a	Uzkeser, Karatay & Melikoğlu (2011)
Turkey (Turk), 40	42.7 (8.5)	5900 (1100)	n/a	n/a	Aktaran et al. (2005)
Turkey (Turk), 119 Turkey (Turk), 196	52.7 (7.5) 50.3 (7.8)	3864 (1546) 3839 (1706)	n/a n/a	n/a n/a	Mustafa et al. (2011)
Iraq (Arab), 25	n/a	4020 (1620)	n/a	n/a	Al-Rekabe, Al-Wayelli & Khadim (2010)
Palestine (Arab), 44	n/a	5000 (2200)	n/a	n/a	Taha (2010)
Saudi Arabia (Arab), 63	36.7 (7.0)	4445 (1790)	n/a	n/a	Al-Khallaf et al. (2012)

[0] Something is wrong with the units for free testosterone even in the original article, I suspect that the cFTs are undervalued by a factor of 10 [1] Assumes US self-identification is accurate, [2] Same individuals at different ages, [3] Individuals with prostate cancer, [4] Individuals with hepatocellular carcinoma, [5] Data is aggregate of two groups, [9] Median value, [10] Sample size averages for age groups 50-59 and 60-69, [11] Mainly European subjects, [12] Diabetic patients, [13] 80% Dane, 6% other European, [14] patients with benign prostatic hyperplasia, [15] adult sex offenders, [16] mating-oriented Filipino subset of larger group, [17] Contained many who were HIV+ so that the T-values would be depressed.

- Testosterone conversion: $1\ \text{nmol/L} = 288.434\ \rho\text{g/mL}$, estradiol conversion: $1\ \rho\text{mol/L} = 0.272\ \rho\text{g/mL}$
- Normal testosterone range [Kapoor et al. (2007)]: 3000 to 12000 ρg/mL [above 8600 is considered high], free testosterone range: 11 to 25 ρg/mL, E_2 range: 10-20 ρg/mL [Tsujimura et al. (2005)]. **Barberia, Giner and V. Cortes-Gallegos (1973)** found that total T can vary widely over one day from 9280 pg/ml at 4 A.M. to 2660 pg/ml at 8 P.M.
- Ethnic assignment for USA and other so-called Western countries is often self-identification.
- Simply looking at absolute values tells one almost nothing about hormonal data. For instance, testosterone values fluctuate widely by sample timing, method of measurement

(plasma, salivary or semen), diet & fasting status, smoking, alcohol consumption, sleep (quantity and quality), stress, nutrition, health/infection, maternal health, pre-natal hormones, energy expenditure, chemical exposure, exercise routine, adiposity, measurement methodology (mass spectrometry is more accurate than immunoassay) and mood, among others. Studies vary in methodology so that it is best to use single studies which concurrently measure all ethnic groups using the same methods.

The average T is measured using a weighted measure i.e. $\frac{\sum(n_t T)}{n_t}$ where n_t is the sample size and T, the average testosterone level per study. Only plasma (not salivary or seminal) testosterone of those aged 18+ years are used (no upper age limit). However, if a group is handicapped by some form of disease (e.g. diabetes) AND has a T < 5,000 pg/mL, they would not be used. If the group is younger than 18 but T ≥ 5,000 pg/mL, they will be included. Studies with mixed ethnic groups (e.g. Brazil) will be used for the majority group ethnicity.

RESULTS

Ethnic Group	n_t	$\sum nT / n_t$ ρg/mL	Rank
African	**4856**	**5442**	3
Outside Africa	3971	5333	
Indigenous	885	5932	
Middle Eastern	**1179**	**4647**	6
Arab	734	4322	
Egyptian	90	9537	
Turk	355	4080	
East Asian	**17984**	**5673**	2
Chinese	8347	5564	
Japanese	2915	5152	
Korean	5250	5700	
Malay	1435	7265	
Thai	37	5378	
European	**41718**	**4992**	5
North America	13909	5056	
Australasia	391	4812	
Europe	26267	4934	
Latin America	1151	5129	
Indo-Aryan	**1487**	**5700**	1
Indian	907	6224	
Iranian	658	4978	
American	**688**	**5187**	4
Latin American	**1374**	**4548**	7

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