

Supplementary material

Table S1a. Averages of boys in the measured schools (Federation).

Region TOWN, school	n	Height (cm)		Age (years)	
		Average (SD)	Range	Average (SD)	Range
Canton Una-Sana	193	180.0 ±6.8		18.4 ±0.4	
BIHAĆ, Gimnazija	67	181.9 ±6.6	167.7-199.0	18.3 ±0.5	17.5-19.2
BIHAĆ, Unsko-sanski koledž	10	179.8 ±5.8	170.9-190.6	18.4 ±0.4	17.9-19.1
BIHAĆ, Medicinska	24	179.5 ±6.6	161.0-191.3	18.5 ±0.3	17.7-19.3
BIHAĆ, Mješovita srednja	87	178.9 ±6.8	162.5-196.3	18.4 ±0.3	17.4-19.5
BIHAĆ, Katolički školski centar	5	177.6	171.7-185.9	18.2	17.8-18.8
Canton 10/Livno	222	183.7 ±6.7		18.3 ±0.6	
LIVNO, Ekonomska	28	185.5 ±6.0	174.9-198.0	18.8 ±0.3	18.1-19.7
LIVNO, Gimnazija	44	184.7 ±6.4	171.9-198.4	18.3 ±0.4	17.4-19.1
TOMISLAVGRAD, Gimnazija M. Marulića	29	184.3 ±7.3	166.7-196.0	18.0 ±0.5	17.0-18.7
DRVAR, Srednja škola	11	184.1 ±6.5	173.4-197.2	18.3 ±0.6	17.7-20.1
TOMISLAVGRAD, Strukovna	22	183.6 ±6.6	162.9-194.6	17.9 ±0.6	17.0-18.6
LIVNO, Strukovna S. Š. Kranjčevića	71	183.3 ±6.5	170.2-200.8	18.6 ±0.4	17.7-20.3
GLAMOČ, Srednja škola Tin Ujević	17	178.8 ±6.3	167.0-191.4	17.6 ±0.5	17.0-18.4
Canton Western Herzegovina	215	184.0 ±6.6		18.2 ±0.5	
ŠIROKI BRIJEG, Gimnazija	28	186.5 ±5.5	177.8-202.0	18.4 ±0.3	17.2-18.9
LJUBUŠKI, Gimnazija	37	185.2 ±6.9	172.2-204.0	18.4 ± 0.5	17.3-19.1
ŠIROKI BRIJEG, Strukovna	47	184.4 ±6.6	170.5-201.8	18.3 ±0.4	17.6-19.0
POSUŠJE, Strukovna	29	183.9 ±5.9	175.3-201.5	18.1 ±0.3	17.4-18.5
GRUDE, Srednja škola A. B. Šimića	21	183.1 ±7.1	173.1-197.4	17.8 ±0.3	17.1-18.4
POSUŠJE, Gimnazija	27	182.2 ±4.3	173.8-194.0	18.1 ±0.4	17.4-19.2
LJUBUŠKI, SSŠ Rudera Boskovića	26	181.5 ±8.3	162.4-194.7	18.3 ± 0.6	17.4-19.3
Canton Herzegovina-Neretva	354	182.7 ±6.5		18.1 ±0.4	
MOSTAR, Gradevinska (Croatian)	17	187.5 ±4.7	178.9-200.4	18.0 ±0.3	17.6-18.6
ČAPLJINA, Srednja škola	22	184.8 ±5.5	175.8-199.5	18.2 ±0.3	17.6-18.8
JABLANICA, Srednja škola	26	184.7 ±5.9	171.5-198.7	18.2 ±0.4	17.1-19.3
STOLAC, Srednja škola	38	183.5 ±6.4	178.3-195.6	18.2 ±0.4	17.6-18.5
MOSTAR, Turističko-ugostiteljska (Croatian)	11	182.6 ±7.6	164.9-196.2	18.1 ±0.4	17.5-18.7
MOSTAR, Elektrotehnička (Bosniak)	57	182.5 ±7.4	167.6-200.6	18.1 ±0.3	17.3-18.7
MOSTAR, Druga gimnazija (Bosniak)	20	181.9 ±4.7	173.0-192.5	18.1 ±0.3	17.6-18.5
MOSTAR, Ekonomska (Croatian)	24	181.8±6.0	170.7-193.9	18.4 ±0.5	17.3-19.0
KONJIČ, Srednja škola	49	181.7 ±6.9	160.9-195.0	18.2 ±0.5	17.1-19.8
MOSTAR, Prometna (Croatian)	35	181.5 ±6.3	169.1-194.9	18.2 ±0.4	17.5-19.7
MOSTAR, Strojarska (Croatian)	30	181.3 ±4.8	168.2-187.4	18.1 ±0.4	17.6-19.6
MOSTAR, Medicinska (Bosniak)	25	180.9 ±7.3	162.5-197.0	17.9 ±0.4	17.2-18.7
Canton Central Bosnia	145	181.8 ±6.5		18.6 ±0.4	
BUGOJNO, Tehnička	20	183.7 ±5.9	172.2-194.3	18.7 ±0.4	18.0-19.8
DONJI VAKUF, Mješovita srednja	20	182.0 ±6.1	171.4-192.7	18.2 ±0.5	17.3-19.4
NOVI TRAVNIK, Opća gimnazija	54	182.0 ±7.5	168.0-203.3	18.6 ±0.4	17.7-19.8
BUGOJNO, Gimnazija	30	181.2 ±5.9	170.9-192.5	18.5 ±0.3	17.8-19.1
TRAVNIK, Mješovita srednja	21	180.1 ±5.5	167.0-189.5	18.7 ±0.3	18.1-19.2

Region TOWN, school	n	Height (cm)		Age (years)	
		Average (SD)	Range	Average (SD)	Range
Canton Zenica-Doboj	230	181.3 ±5.9		18.2 ±0.4	
ZENICA, Opća gimnazija	33	183.5 ±5.6	174.5-196.4	18.0 ±0.5	17.0-18.7
ZENICA, Ekonomska	16	182.2 ±6.2	171.3-195.3	18.2 ±0.4	17.9-19.3
ZENICA, Muzička	7	181.1 ±5.9	172.0-188.2	18.1 ±0.4	17.3-18.7
ZENICA, Prva gimnazija	45	181.0 ±5.7	168.3-193.4	18.2 ±0.3	17.4-19.1
ZENICA, Tehnička	116	180.8 ±5.6	167.6-196.6	18.3 ±0.3	17.6-19.1
ZENICA, Druga gimnazija	13	180.7 ±7.3	169.2-200.3	18.0 ±0.4	17.5-19.1
Canton Sarajevo	360	181.8 ±6.8		18.4 ±0.6	
SARAJEVO, Druga gimnazija	24	184.0 ±5.4	172.6-194.0	18.1 ±0.3	17.4-18.7
SARAJEVO, Treća gimnazija	28	182.9±5.8	169.4-193.0	17.5±0.2	17.0-17.9
SARAJEVO, Građevinsko-geodetska	30	182.5 ±5.0	169.8-196.7	18.7 ±0.6	17.6-20.0
SARAJEVO, Elektrotehnička za energetiku	66	182.3 ±6.9	159.7-198.1	18.6 ±0.4	17.7-19.7
SARAJEVO, Dizajnerska	15	182.3 ±5.0	173.9-192.2	18.7 ±0.5	18.0-20.2
SARAJEVO, Prominjenjih umjetnosti	14	182.1±6.6	175.2-202.0	18.7±0.4	18.3-19.6
SARAJEVO, Gimnazija Obala	8	181.8 ±5.1	172.9-187.1	18.4 ±0.7	17.6-19.8
SARAJEVO, Prva gimnazija	22	181.8±7.1	168.6-196.0	18.4±0.4	17.8-19.4
SARAJEVO, Ugostiteljsko-turistička	50	181.6±7.9	165.3-205.3	18.6±0.6	17.6-20.1
SARAJEVO, Katolički školski centar	25	180.7 ±7.5	167.5-199.3	18.3 ±0.4	17.6-19.7
SARAJEVO, Ekonomska	26	180.6 ±6.1	165.6-193.6	18.4±0.4	17.4-19.0
SARAJEVO, Metalskih zanimanja	52	180.3 ±7.0	159.9-194.4	18.3 ±0.6	17.3-19.9
Canton Tuzla	233	179.9 ±5.9		18.1 ±0.4	
TUZLA, Turističko-ugostiteljska	3	181.8	173.2-186.9	17.9	17.6-18.2
TUZLA, Ekonomska	9	181.7 ±1.9	179.0-185.0	17.9 ±0.5	17.0-18.6
GRAČANICA, Gimnazija	21	181.6 ±5.0	170.5-190.8	18.1 ±0.3	17.3-18.5
TUZLA, Medicinska	43	181.0 ±5.4	170.7-194.9	18.1 ±0.4	17.4-19.5
TUZLA, Rudarska	41	180.8 ±6.1	165.5-193.0	18.2 ±0.6	17.1-20.6
TUZLA, Građevinsko-geodetska	36	179.6 ±6.0	168.6-194.0	18.1 ±0.4	17.2-18.7
TUZLA, Gimnazija Ismet Mujezinović	17	179.6 ±4.7	170.1-184.1	18.4 ±0.3	18.0-19.0
DOBOJ-ISTOK, Mješovita srednja	20	178.4 ±6.9	167.1-193.7	17.6 ±0.4	17.1-18.3
GRAČANICA, Mješovita srednja	43	177.8 ±6.1	165.3-191.1	18.3 ±0.2	18.0-18.7
Canton Gorazde (Bosnian-Podrinje)	69	180.5 ±6.2		18.1 ±0.4	
GORAŽDE, Tehnička Hasib Hadžović	49	181.5 ±5.6	168.3-192.0	18.0 ±0.4	17.7-19.4
GORAŽDE, Mješovita srednja E. Pozderović	20	177.9 ±6.8	164.8-188.0	18.2 ±0.3	17.7-18.7

Abbreviations: SŠŠ = Srednja strukovna škola (high vocational school).

Table S1b. Averages of boys in the measured schools (Republika Srpska).

Region TOWN, school	n	Height (cm)		Age (years)	
		Average (SD)	Range	Average (SD)	Range
Region Prijedor	192	180.9 ±7.2		18.6 ±0.5	
PRIJEDOR, Gimnazija Sveti Sava	31	183.2 ±7.4	171.2-199.4	18.6 ±0.4	17.5-19.3
PRIJEDOR, Elektrotehnička	58	181.7 ±7.6	164.9-200.3	18.5 ±0.5	17.6-19.5
PRIJEDOR, Medicinsko-tehnološka i gradev.	33	180.2 ±5.8	169.0-194.7	18.6 ±0.4	18.0-19.8
PRIJEDOR, Mašinska	70	179.5 ±7.0	166.8-201.0	18.5 ±0.5	17.6-19.6
Region Banja Luka	170	180.6 ±6.6		18.4 ±0.5	
BANJA LUKA, Gimnazija	47	181.7 ±6.8	170.9-200.4	18.7 ±0.4	18.1-20.2
BANJA LUKA, Ugost.-trgov.-turistička	56	180.3 ±7.0	165.3-198.0	18.2 ±0.5	17.3-19.2
BANJA LUKA, Poljoprivredna	28	180.1 ±5.9	170.8-194.3	17.9 ±0.3	17.4-18.3
BANJA LUKA, Elektrotehnička „N. Tesla“	19	180.0 ±6.4	167.0-193.5	17.8 ±0.4	18.2-19.4
BANJA LUKA, Tehnološka	20	179.8 ±5.8	167.3-194.0	18.9 ±0.6	18.1-20.3
Region Mrkonjić Grad	80	180.3 ±6.2		18.3 ±0.6	
MRKONJIĆ GRAD, Gimnazija	39	180.6 ±7.4	167.2-197.2	18.1 ±0.6	17.0-19.6
MRKONJIĆ GRAD, Mašinska	41	180.0 ±4.7	170.9-189.0	18.5 ±0.5	17.6-19.6
Region Doboј	167	179.8 ±6.5		18.1 ±0.4	
DOBOJ, Medicinska	28	180.4 ±6.7	166.0-199.6	18.1 ±0.5	17.1-19.5
DOBOJ, Saobracajna i elektro-škola	55	180.3 ±6.3	166.3-197.3	18.2 ±0.3	17.2-18.8
DOBOJ, Upravna & ugostiteljska	32	179.5 ±6.8	165.1-191.4	18.1 ±0.4	17.0-18.8
DOBOJ, Ekonomska & trgovinska	16	179.5 ±4.7	170.6-186.9	17.9 ±0.5	17.1-18.7
DOBOJ, Tehnička	36	178.8 ±6.8	164.5-195.3	18.1 ±0.5	17.0-19.5
Region Bijeljina-Zvornik	233	181.2 ±6.8		18.0 ±0.5	
BIJELJINA, Gimnazija Filip Višnjić	32	183.1 ±5.5	170.9-194.4	17.4 ±0.3	17.0-18.5
BIJELJINA, Tehnička Mihaljo Pupin	67	181.6 ±7.8	164.2-200.0	18.2 ±0.3	17.7-18.8
ZVORNIK, Gimnazija & stručna	12	181.1 ±5.7	168.6-190.3	17.3 ±0.2	17.0-17.6
BIJELJINA, Ekonomska	34	180.8 ±5.8	163.9-193.0	18.3 ±0.3	17.6-19.3
ZVORNIK, Ekonomska	12	180.8 ±6.4	164.3-189.6	17.8 ±0.5	17.1-18.5
UGLJEVIK, Sr. škola 'M. Petrović Alas'	29	180.2 ±5.6	166.2-192.8	18.3 ±0.3	17.7-18.9
ZVORNIK, Tehnički školski centar	47	180.1 ±7.1	165.6-197.8	18.1 ±0.4	17.3-18.8
Region Istočno Sarajevo	60	184.0 ±5.5		18.1 ±0.4	
ISTOČNO SARAJEVO, Gimnazija & stručna	21	185.9 ±4.9	176.8-198.0	18.1 ±0.3	17.5-18.6
ISTOČNO SARAJEVO, Sr. škola 28. juni	39	182.7 ±5.5	171.4-193.0	18.1 ±0.4	17.3-19.6
Region Romanija-Foča	91	181.1 ±6.4		18.3 ±0.3	
FOČA, SŠC	11	183.1 ±8.4	172.6-196.3	18.2 ±0.2	17.9-18.6
PALE, SSČ	23	181.4 ±6.5	169.6-195.4	18.4 ±0.4	17.9-19.5
ROGATICA, Srednja škola	57	180.5 ±5.9	166.8-189.9	18.3 ±0.3	17.8-19.5
Region Trebinje	193	184.6 ±7.6		18.5 ±0.5	
TREBINJE, Tehnička	21	187.0 ±7.3	174.7-200.0	18.7 ±0.4	18.0-19.2
TREBINJE, Gimnazija Jovan Dučić	61	185.7 ±7.3	175.4-206.6	18.3 ±0.5	17.4-19.3
NEVESINJE, SŠC Aleksa Šantić	71	184.5 ±7.1	164.4-201.6	18.6 ±0.4	18.1-20.4
TREBINJE, Centar srednjih škola	40	182.0 ±8.4	163.1-204.0	18.2 ±0.5	17.5-19.2

Abbreviations: SŠC = Srednjoškolski centar (high school center).

Table S2. Averages of girls in the measured schools.

TOWN, school	<i>n</i>	Average age (SD)	Height (cm)		Average height of boys from the same school	Difference in height between sexes
			Average (SD)	Range		
TOMISLAVGRAD, Gimnazija	11	17.9 ±0.2	171.0 ±5.6	158.8-180.5	184.3	13.3
POSUŠJE, Strukovna	19	-	169.4 ±4.5	161.8-180.7	183.9	14.5
GLAMOČ, Sr. škola Tin Ujević	10	17.7 ±0.3	169.3 ±5.3	161.9-178.7	178.8	9.5
DRVAR, Srednja škola	11	18.2 ±0.4	169.2 ±6.1	154.1-175.4	184.1	14.9
MOSTAR, Druga gimnazija	18	18.0 ±0.3	168.3 ±7.6	158.6-189.8	181.9	13.6
TOTAL	69	18.0 ±0.4	169.4 ±6.0	154.1-189.8		

Table S3a. Regional averages of male height (based on the self-reported place of residence) and population size in each region, relative to the total population of BiH (excluding Canton Posavina and the Brčko district).

Region	Average height (cm)	Population	% total
Region Trebinje	184.5	72,767	2.0
Canton Western Herzegovina	184.0	97,893	2.7
Region Istočno Sarajevo	184.0	30,077	0.8
Canton 10/Livno	183.7	90,727	2.5
Canton Herzegovina-Neretva	182.8	236,278	6.5
Canton Sarajevo	181.7	438,443	12.0
Canton Central Bosnia	181.7	273,149	7.5
Canton Zenica-Doboj	181.4	385,067	10.5
Region Bijeljina-Zvornik	181.2	286,880	7.9
Region Romanija-Foča	181.0	101,835	2.8
Region Prijedor	180.9	160,453	4.4
Canton Goražde	180.6	25,336	0.7
Region Banja Luka	180.5	399,469	10.9
Region Mrkonjić Grad	180.3	37,610	1.0
Canton Una-Sana	180.0	299,343	8.2
Canton Tuzla	180.0	477,278	13.1
Region Doboj	179.7	237,898	6.5
BiH total	181.7	3,650,503	100.0
Canton Posavina	-	48,089	-
Brčko district	-	93,028	-

Note: The data for „Region Istočno Sarajevo“ were computed as an average of 4 municipalities (Istočna Ilidža, Istočni Stari Grad, Istočno Novo Sarajevo and Trnovo). Population size in each region was based on the preliminary results of the 2013 Census (http://www.bhas.ba/obavjestenja/Saopcenje_Preliminarni_rezultati_Bos.pdf).

Table S3b. Averages of male height corrected for population size in 17 regions.

	Average height (cm)	Population	% total	Average height corrected for population size
Bosnia total	180.9	3,152,838	86.4	180.8
Herzegovina total	183.6	497,665	13.6	183.4
Federation total	181.9	2,323,514	63.6	181.4
Republika Srpska total	181.4	1,326,989	36.4	180.9
BiH TOTAL	181.7	3,650,503	100.0	181.2

Table S4. Correlations between average male height and socioeconomic variables (for the year 2013) in 17 regions of BiH.

Variable 1	Variable 2	BiH (17 regions)	Bosnia (13 regions)	Herzegovina (4 regions)
Height	Net wage	0.43 (p=0.08)	0.34 (p=0.25)	-0.58 (p=0.42)
Height	Unemployment	0.28 (p=0.28)	0.22 (p=0.46)	0.42 (p=0.58)
Height	Agricultural activities (total)	-0.24 (p=0.35)	-0.48 (p=0.10)	0.94 (p=0.06)
Height	Agricultural activities (market-oriented)	0.11 (p=0.69)	-0.36 (p=0.23)	0.61 (p=0.39)
Net wage	Unemployment	0.07 (p=0.80)	-0.04 (p=0.91)	0.42 (p=0.58)
Net wage	Agricultural activities (total)	-0.86 (p<0.001)	-0.93 (p<0.001)	-0.68 (p=0.32)
Net wage	Agricultural activities (market-oriented)	-0.24 (p=0.35)	-0.49 (p=0.09)	0.30 (p=0.71)
Unemployment	Agricultural activities (total)	0.06 (p=0.83)	0.00 (p=0.99)	0.38 (p=0.62)
Unemployment	Agricultural activities (market-oriented)	0.23 (p=0.37)	-0.02 (p=0.94)	0.90 (p=0.10)
Agric. activities (total)	Agricultural activities (market-oriented)	0.58 (p=0.015)	0.66 (p=0.014)	0.43 (p=0.57)

Note: Significant correlations are in bold.

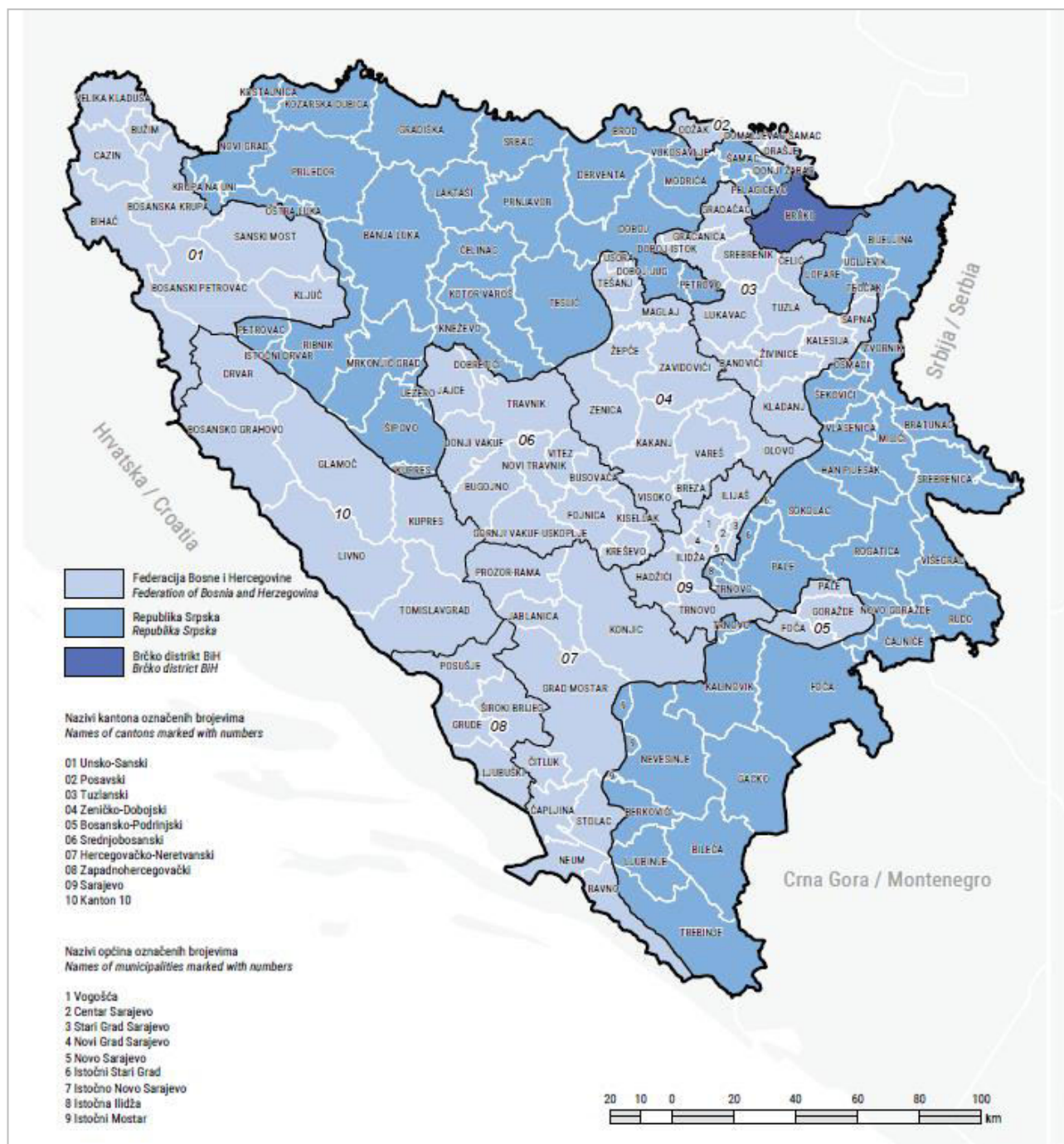


Figure S1. Administrative map of Bosnia and Herzegovina.

Source: Census of population, households and dwellings in Bosnia and Herzegovina, 2013. Final results.

<http://www.popis2013.ba/popis2013/doc/Popis2013prvovlzdanje.pdf>

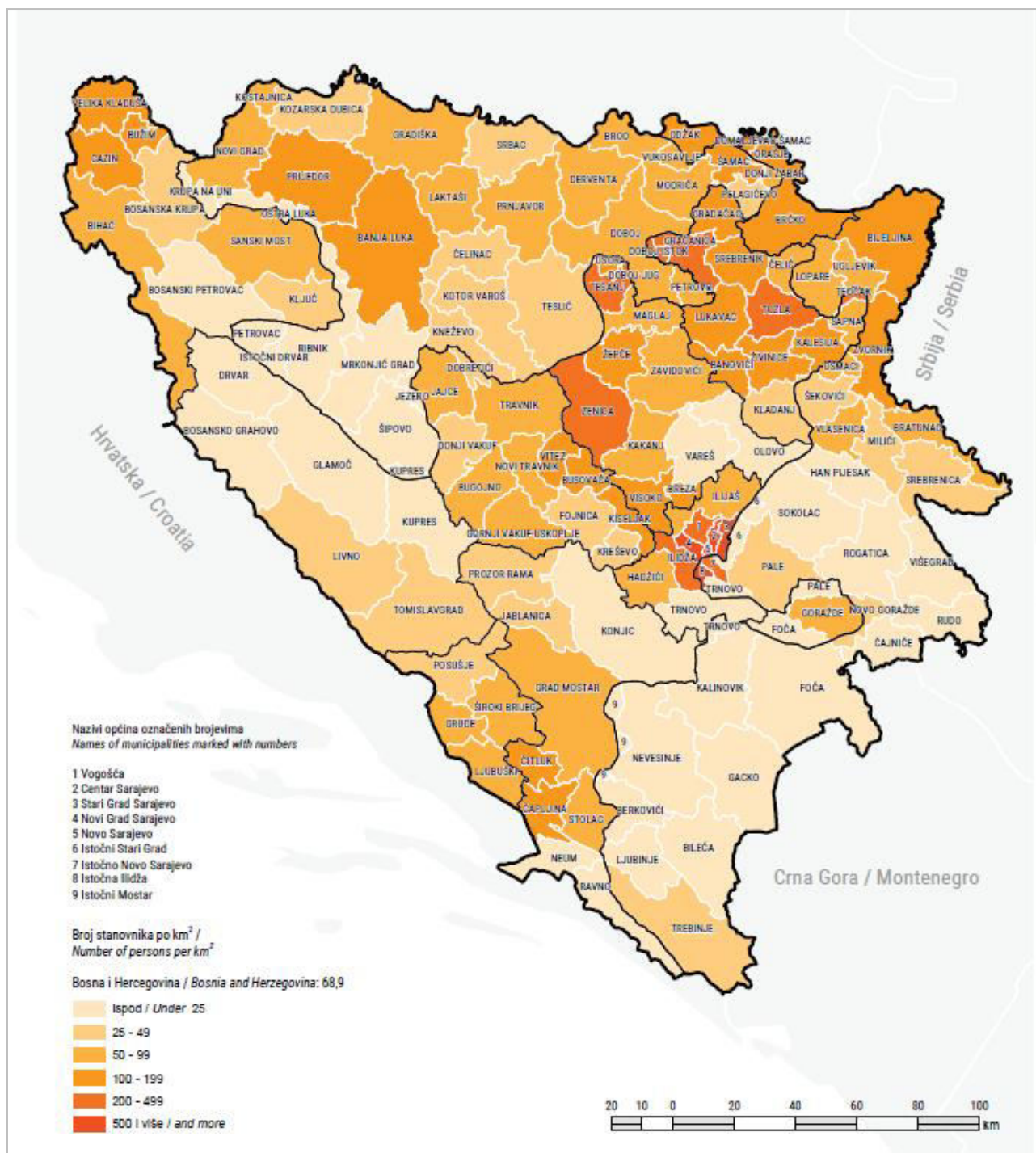


Figure S2. Population density in Bosnia and Herzegovina (people/km²).

Source: Census of population, households and dwellings in Bosnia and Herzegovina, 2013. Final results.
<http://www.popis2013.ba/popis2013/doc/Popis2013prvovlzdanie.pdf>



Figure S3. Density of settlements in Bosnia and Herzegovina.

Source: Census of population, households and dwellings in Bosnia and Herzegovina, 2013. Final results.

<http://www.popis2013.ba/popis2013/doc/Popis2013prvolzdanje.pdf>

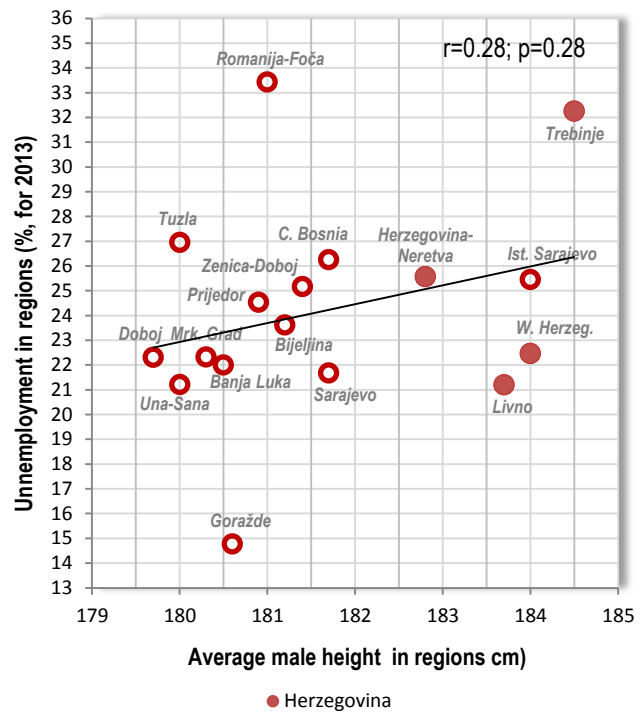
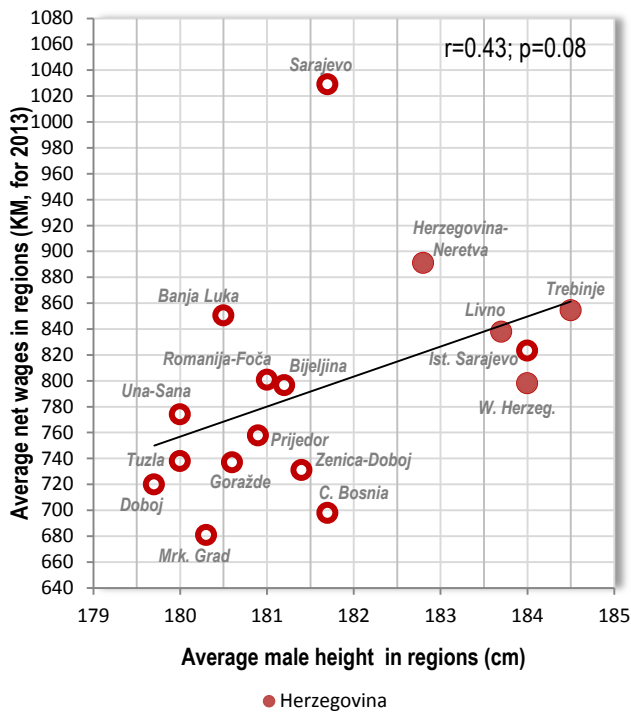


Figure S4b. Relationship between average male height and average net wages (for 2013, in KM/convertible marks) in 17 regions of BiH.

Figure S4b. Relationship between average male height and unemployment (for 2013) in 17 regions of BiH.

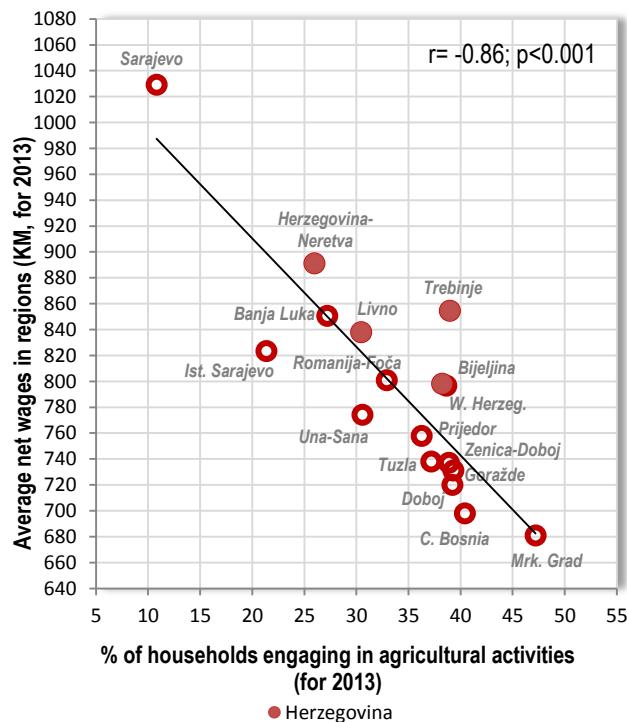


Figure S4c. Relationship between % of households engaging in agricultural activities (total) and average net wages (for 2013, in KM/convertible marks) in 17 regions of BiH.

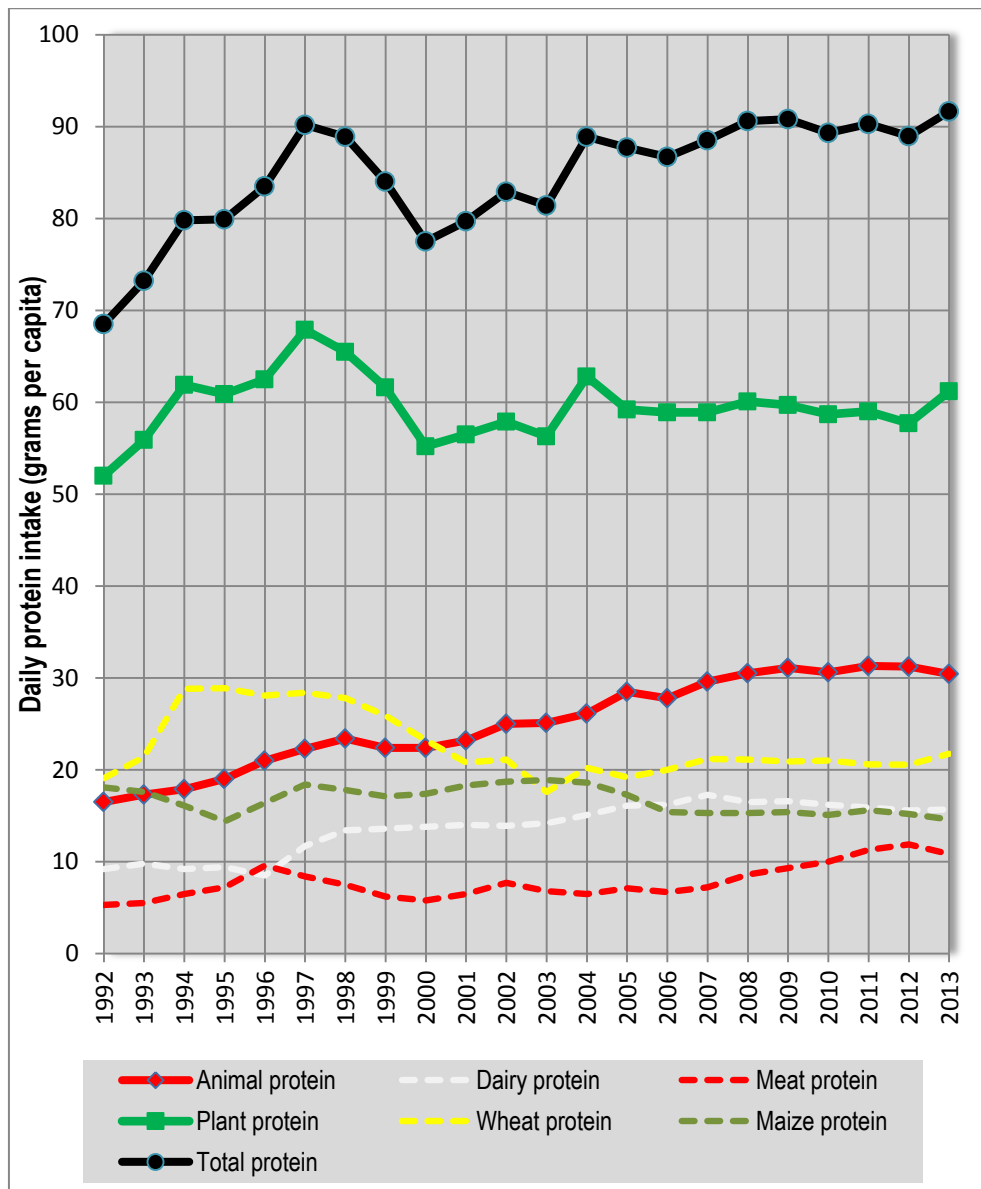


Figure S5. Average daily protein intake from major protein sources in BiH between 1992-2013.

Source: FAOSTAT, <http://faostat3.fao.org/download/FB/CC/E>.



Figure S6. Relief map of Bosnia and Herzegovina.

Source: https://commons.wikimedia.org/wiki/File:Bosnia_and_Herzegovina_relief_location_map.png