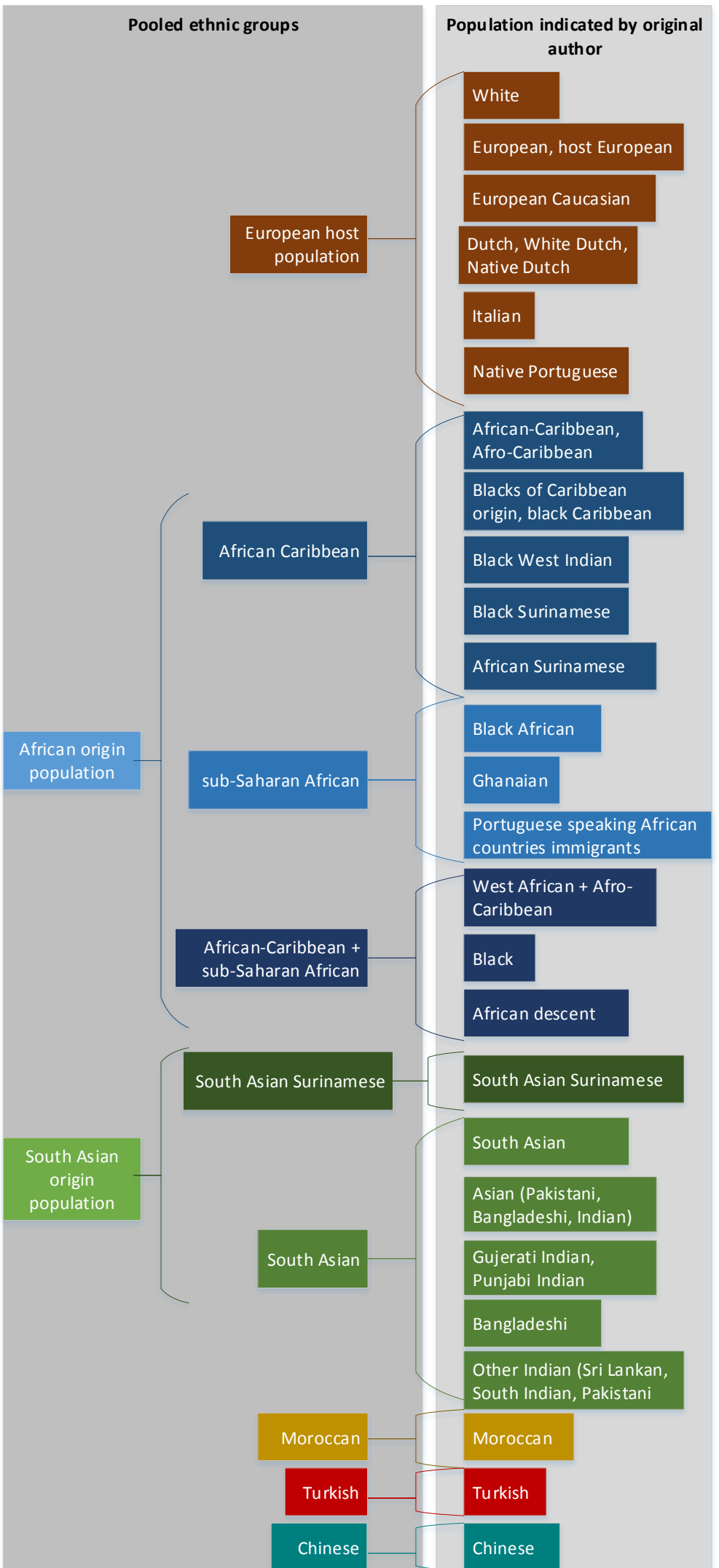


Supplementary Digital Content to 'Hypertension awareness, treatment and control among minority ethnic populations in Europe: a systematic review and meta-analysis'

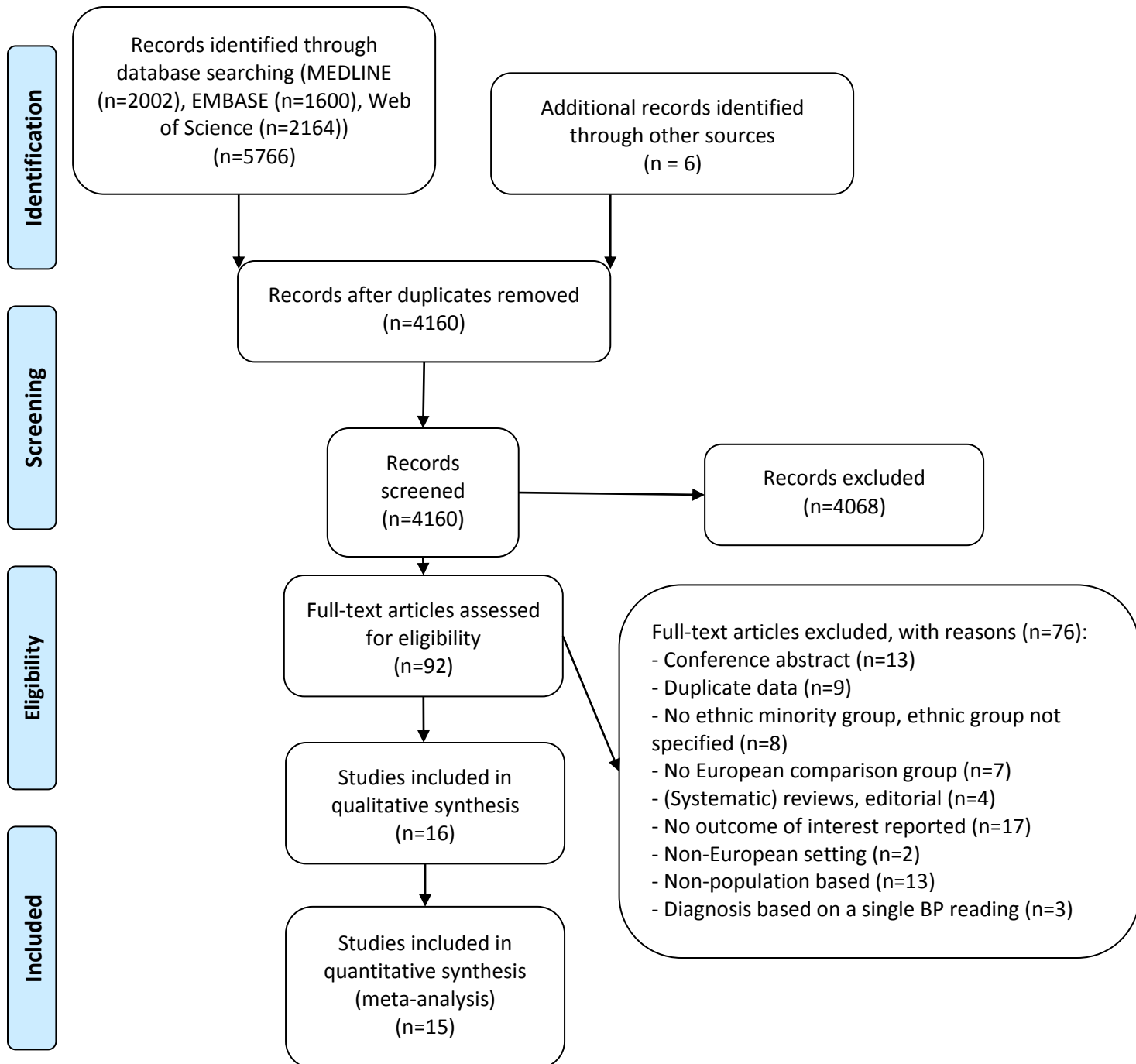
Supplementary Digital Content 1 – Search strategy in Medline

- # Searches
- 1 hypertension/ or exp blood pressure/
- 2 (high blood pressure or hypertens* or blood pressure or "140/90mm" or "140/90" or "140 and 90 mm" or "140 mm hg" or "90 mm hg" or calcium antagonist? or calcium-channel or angiotensin or ace or beta blocker? or adrenergic or diuretic?).ab,kf,ti.
- 3 or/1-2 [hypertension]
- 4 exp europe/
- 5 (Europe* or Bulgaria? or Czech* or Hungar* or Poland or Moldova? or Romania? or Russia? or Slovakia? or Ukrain* or Denmark or Estonia? or Faroe or Finland or Iceland* or Ireland or "Isle of Man" or Latvia? or Lithuania? or Norway or Sweden or england or United Kingdom or Britain or Albania or Andorra or "Bosnia and Herzegovina" or Croatia or Gibraltar or Greece or Holy See or Italy or Malta or Montenegro or Portugal or San Marino or Serbia or Slovenia or Spain or Yugoslav or Macedonia or Austria or Belgium or France or Germany or Liechtenstein or Luxembourg or Monaco or Netherlands or Switzerland or English or Scottish or Irish or Dutch or british or Danish or Swedish or Finnish or Norwegian or Belgium or German or French or Spanish or Portuguese or Italian or Swiss or Austrian or Slovakian or Polish or Hungarian or Croatian or Bosnian or Serbian or Bulgarian or Albanian or Greek or Macedonian or Romanian or Ukraine or Moldavian or Belarussian or Russian or Estonian or Latvian or Lithuanian or Oslo or Bergen or Stockholm or Gothenburg or Malmo or Copenhagen or Helsinki or London or Manchester or Leeds or Liverpool or Edinburgh or Glasgow or Dublin or Berlin or Hamburg or Bremen or Cologne or Munich or Stuttgart or Frankfurt or Amsterdam or Rotterdam or The Hague or Brussel or Antwerp or Luxemburg or Paris or Nantes or Lyon or Marseille or Toulouse or Madrid or Malaga or Sevilla or Valencia or Porto or Lisbon or Roma or Napoli or Milano or Zurich or Athens or Tirana or Sarajevo or Sofia or Zagreb or Belgrade or Budapest or Bratislava or Wien or Warszawa or Minsk or Tallinn or Riga or Vilnius or Kiev or Moscow or eu citizen?).ab,jw,kf,ti.
- 6 or/4-5 [in Europe setting]
- 7 african continental ancestry group/ or ethnology/ or ethnic groups/ or arabs/ or inuits/ or "emigration and immigration"/ or exp "emigrants and immigrants"/
- 8 ethnology.fs.
- 9 (Ethnic or ethnicity or Ethnology or Race or Racial or Migrant? or Immigrant? or Immigration or Refugee? or Nationality or (minority adj2 group?) or ((Africa or Northern Africa or Sub-Saharan or Eastern Africa or Middle Africa or Southern Africa or Western Africa or America? or Caribbean or Asia or Oceania or Australia or New Zealand or Melanesia or Micronesia or Polynesia or African? or Algerian or Egyptian or Libyan or Moroccan or Sudanese or Tunisian or Western Saharan or Arab or Afro-Arab or Arabic or Black? or Beninese or Burkinabe or Cabo Verdeans or Ivorian or Gambian or Ghanaian or Guinean or Guinea-Bissauan or Liberian or Malian or Mauritanian or Nigerian or Nigerian or Senegalese or Sierra Leonean or Togolese or Burundian or Eritrean or Ethiopian or Kenyan or Malawian or Mozambican or Rwandan or Somalian or Sudanese or Ugandan or Tanzanian or Zambian or Zimbabwean or Angolan or Cameroonian or Chads or Congeal or Guinean or Gabonese or Botswanian or Mesotho or Namibian or American or Canadian or Caribbean or Jamaican or Haitian or Cuban or Mexican or Costa Rican or Guatemalan or Honduran or Argentinean or Bolivian or Brazilian or Chilean or Colombian or Ecuadorian or Guyanese or Paraguayan or Peruvian or Surinamese or Uruguayan or Venezuelans or Asian or Kazakh or Kyrgyzstanis or Tajikistanis or Turkmens or Uzbekistanis or chinese or South-Korean or North-Korean or Japanese or Mongolian or Bruneian or Cambodian or Indonesian or Laotian or Malaysian or Myanmarese or Burmese or Philipppian or Singaporean or Thai or Timorese or Vietnamese or Afghan or Bangladeshis or Bhutanese or Indian or Iranian or Nepalese or Pakistani or Sri Lankan or Armenian or Azerbaijani or Bahraini or Cypriot or Georgian or Iraqi or Israeli or Jordanian or Kuwaiti or Lebanese or Omanis or Qataris or Saudi Arabian or Palestinian or Syrian or Turk* or Emirati or Yemeni or hispanic?) adj2 (group? or minority or speaking or culture))).ab,kf,ti.
- 10 or/7-9 [minority ethnic groups]
- 11 and/3,6,10
- 12 (Maternal mortality or Gestational age or Apgar score or Birth or Gestational weight gain or Macrosomia or Maternal characteristics or Perinatal death or pregnancy or Maternal weight or Obstetric history or Gestational diabetes or parous woman or Fetus or cesarean section or abortion or neonatal death or fetal or baby or weeks gestation or adverse perinatal outcome or placenta or nulliparous woman or preterm or antenatal care or first trimester or macrosomia or Maternal health

- or Maternal death or Labo?r or pre-eclampsia or Contraception or pregnant or GDM or SMA or lga or IBW).ab,kf,ti. [VOS light blue]
- 13 (Trauma or surgeon or intensive care unit or surgical procedure or resuscitation or intravenous fluid or hematoma or hospital mortality or stay or blood transfusion or fracture or hospital stay or ranking scale score or pediatric patient or mechanical ventilation or seizure or recovery or chemotherapy or antibiotic or intracranial pressure or oxygenation or propofol or blood gase or remifentanil or induction or oxygen or catheter or carbodioxide or brain injury or ventilation or intubation or laparotomy or analgesia or general anesthesia or anaesthesia or extubation or sedation or hypothermia or dog or cocaine or lactate or cardiac surgery or acidosis or fentanyl or bolus).ab,kf,ti. [VOS dark blue]
- 14 (animal? or compound? or plant? or substance? or estrogen or traditional medicine or asset or herb? or mixture or leukocyte or pig? or cat? or "in vivo" or rabbit? or hamster or bacterium or infarct size or sham or chinese hamster ovary or chinese hamster overay cell or rat or rats or gene expression or shr or ici or mouse or fluorescence or saline or density or protein or growth factor or colon).ab,kf,ti. [VOS yellow]
- 15 (Mum or Runner).ab,kf,ti. [VOS orange]
- 16 (transmission or wild type).ab,kf,ti. [VOS pink]
- 17 brazilian state capital.ab,kf,ti. [VOS red]
- 18 or/12-17
- 19 11 not 18
- 20 aware*.ab,kf,sh,ti. [awareness]
- 21 (treat* or drug? or medication).ab,kf,ti.
- 22 (drug therapy or drug effects or "therapeutic use" or prevention control or therapy or administration dosage).fs.
- 23 21 or 22 [treatment]
- 24 (control* or monitoring).ab,kf,ti. [control]
- 25 or/20,23-24 [awareness treatment control]
- 26 19 and 25
- 27 animals/ not humans/
- 28 26 not 27
- 29 (((heliu or rodam or chip or sunset or ghaia) adj2 (study or trial)) or "healthy life in an urban setting" or "Research on Obesity and Type 2 Diabetes among African Migrants" or "chinese in prato" or "Surinamese in The Netherlands: Study on Ethnicity and Health" or "ghanaians in amsterdam aimhy programme" or aimhy inform or "Ancestry Informative Markers in Hypertension" or NCT02847338).ab,kf,ti.
- 30 28 or 29
- 31 remove duplicates from 30



Supplementary Digital Content 3 - Flowchart of study identification and selection

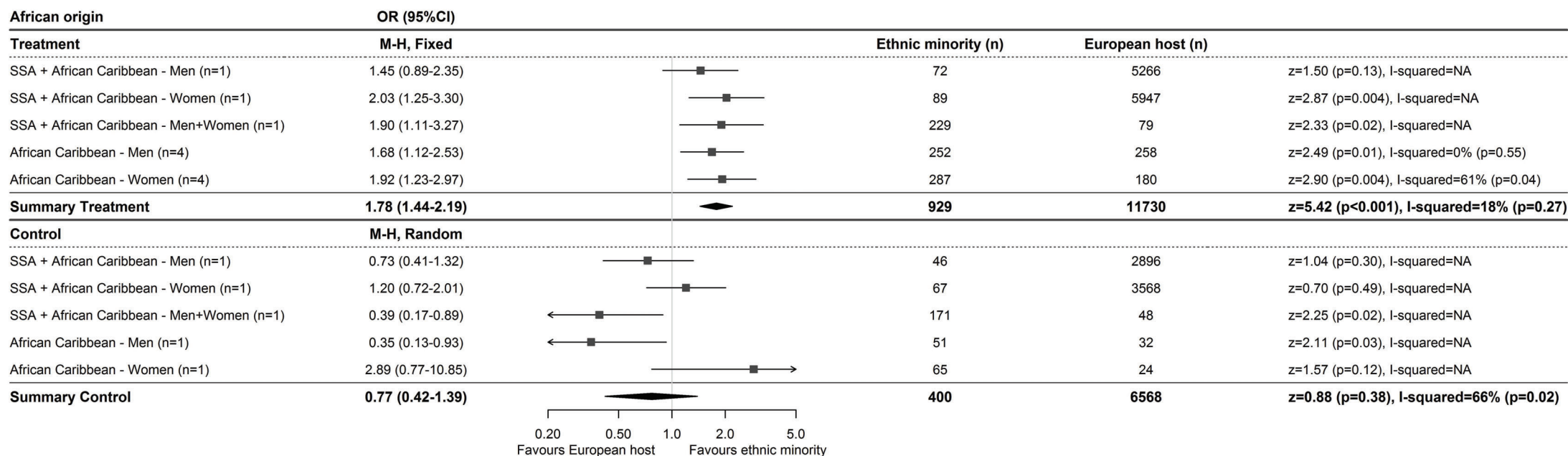


Supplementary Digital Content 4 – Study results of included studies using blood pressure cut-offs of systolic ≥ 160 and/or diastolic ≥ 95 mmHg to define hypertension

Hypertension										
Author, year	Diagnostic method	Definition	Population	Total n	Prevalence n (%)	Awareness ^q n (%)	Treatment [~] n (%)	Control [^] n (%)	Control & (n, %)	
Cappuccio, 1997 (15)	Automatic ultrasound sphygmomanometer; three BP reading at left arm, mean of last two readings	SBP ≥ 160 and/or DBP ≥ 95 or being on antihypertensive medication	Men+women							
			White:	524	79 (15.1)	62 (78.5)	48 (60.8)	40 (83.4)	40 (50.7)	
			SSA+African Caribbean:	549	229 (41.7)	202 (88.2)	171 (74.7)	113 (66.2)	113 (49.4)	
			SA:	505	134 (26.5)	98 (73.1)	81 (60.4)	63 (77.8)	63 (47.0)	
Chaturvedi, 1993 (16)	Ambulatory blood pressure monitor; mean of first two resting office BP readings	SBP ≥ 160 and/or DBP ≥ 95 or being on antihypertensive medication	Men				n/a		n/a	n/a
			European:	272	38 (14.0)		20 (52.6)			
			West African+Afro-Caribbean:	247	78 (31.6)		52 (66.7)			
			Women							
European:	313	41 (13.1)		31 (75.6)						
West African+Afro-Caribbean:	334	125 (37.4)		101 (80.8)						
Cruickshank 1983 (18)	Random zero sphygmomanometer; first of two BP readings at rights arm	SBP ≥ 160 or DBP ≥ 95 or being on antihypertensive treatment (treatment not specified)	Men				n/a		n/a	n/a
			White:	439	97 (22.1)		6 (6.2)			
			Black West Indian:	173	45 (26.0)		2 (4.7)			
			Asian:	172	29 (16.9)		2 (7.4)			
			Women							
			White:	164	26 (15.9)		1 (4.0)			
Black West Indian:	101	28 (27.7)		7 (33.3)						
Cruickshank 1991 (17)	Random zero sphygmomanometer; mean of two BP readings	SBP ≥ 160 and/or DBP ≥ 95 or being on antihypertensive treatment (treatment not specified)	Men				n/a		n/a	n/a
			White:	49	10 (20.4)		3 (30.0)			
			Afro-Caribbean:	53	18 (34.0)		11 (61.1)			
			Indian:	47	15 (31.9)		6 (40.0)			
			Women							
			White:	52	18 (34.6)		14 (77.8)			
Afro-Caribbean:	53	24 (45.3)		13 (54.2)						
Indian:	60	8 (13.3)		4 (50.0)						
Cruickshank 2001 (19)	Standard mercury sphygmomanometer; three BP readings, mean of last two readings	SBP ≥ 160 and/or DBP ≥ 95 or being on antihypertensive medication; HT control $< 140/90$	Men				n/a		n/a	n/a
			European:	265	69 (26.0)		32 (46.4)	14 (43.8)	14 (20.3)	
			African-Caribbean:	222	80 (36.0)		51 (63.8)	11 (21.6)	11 (13.8)	
			Women							
			European:	293	51 (17.4)		24 (80.4)	3 (12.5)	6 (11.8)	
			African-Caribbean:	258	91 (35.3)		65 (71.4)	19 (29.2)	19 (20.9)	
Haines, 1987 (20)	Random zero sphygmomanometer; mean of two BP readings	SBP ≥ 160 and/or DBP ≥ 95 or being on antihypertensive treatment (treatment not specified)	Men				n/a		n/a	n/a
			Black-Caribbean:	191	31 (16.2)		17 (54.8)			
			White:	450	44 (9.8)		23 (52.3)			
			Women							
			Black-Caribbean:	224	19 (8.5)		16 (84.2)			
			White:	486	44 (9.1)		27 (61.4)			
Knight, 1993 (21)	Electronic sphygmomanometer; multiple readings	SBP ≥ 160 or DBP ≥ 95 or being on antihypertensive treatment (treatment not specified)	Men				n/a		n/a	n/a
			Asian:	128	34 (26.6)		6 (17.6)			
			Non-Asian:	160	37 (23.1)		4 (10.8)			
Primatesta, 2000 (24)	Automated device; three BP readings, mean of last two readings on right arm	SBP ≥ 160 or DBP ≥ 95 or being on antihypertensive medication; HT control BP $< 160/95$	Men				n/a		n/a	n/a
			White:	14629	5266 (36)		2896 (55)	1853 (64)	1853 (35.2)	
			SSA+African Caribbean:	136	72 (53)		46 (64)	26 (57)	26 (36.1)	
			SA:	286	146 (51)		73 (50)	50 (69)	50 (34.2)	
			Women							
			White:	16 990	5947 (35)		3568 (60)	2248 (63)	2248 (37.8)	
			SSA+African Caribbean:	159	89 (56)		67 (75)	45 (67)	45 (50.6)	
SA:	243	80 (33)		52 (65)	23 (45)	23 (28.8)				

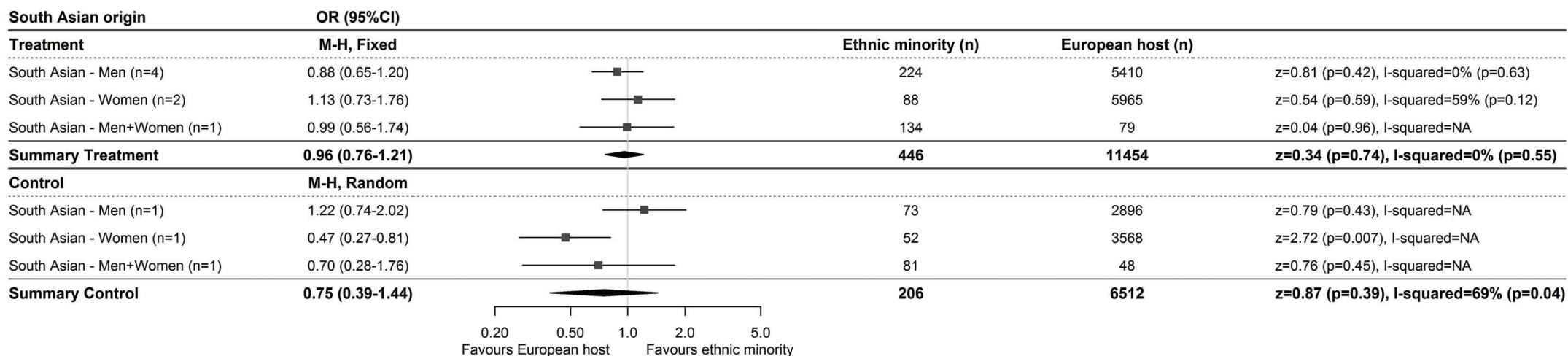
^q In percentage of participants with hypertension; [~] In percentage of participants with hypertension; [^] In percentage of those on treatment for hypertension; & In percentage of participants with hypertension

Supplementary Digital Content 5 - Comparison of prevalence of hypertension treatment and control among those on treatment between African origin and European host populations of studies using blood pressure cut-offs of systolic ≥ 160 and/or diastolic ≥ 95 mm Hg to define hypertension



Diamonds denote the weighted pooled odds ratios with 95% confidence intervals. M-H, Mantel-Haenszel; SSA; Sub-Saharan African; OR, odds ratio; CI, confidence interval, "n" is the number of comparisons available for each subgroup

Supplementary Digital Content 6 - Comparison of prevalence of hypertension treatment and control among those on treatment between South Asian origin and European host populations of studies using blood pressure cut-offs of systolic ≥ 160 and/or diastolic ≥ 95 mm Hg to define hypertension



Diamonds denote the weighted pooled odds ratios with 95% confidence intervals. M-H, Mantel-Haenszel; OR, odds ratio; CI, confidence interval, "n" is the number of comparisons available for each subgroup

Supplementary Digital Content 7 - Summary table of risk of bias assessment

		Ayemang, 2005	Ayemang, 2006	Ayemang, 2015	Cappuccio, 1997	Chatuverdi, 1993	Cruickshank, 1983	Cruickshank, 1991	Cruickshank, 2001	Haines, 1987	Knight, 1993	Lemic-Stojcevic, 2001	Lopes, 2016	Modesti, 2017	Nazroo, 2009	Patel, 2007	Primatesta, 2000
External validity																	
	Study target population, close representation of national population	Orange		Orange	Orange			Orange	Orange	Orange	Orange	Orange	Orange	Orange	Green	Orange	Green
	Sampling frame, close representation of target population	Green	Green	Green	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Green	Green	Orange	Green
	Random selection to select the sample	Green				Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Orange	Green
	Non-response bias	Orange	Orange	Green	Green	Orange		Green	Orange	Orange	Green	Orange	Orange	Orange	Orange	Orange	Green
Internal validity																	
	Data collected directly from subject	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	Acceptable case definition	Green	Green	Green	Green	Green	Orange	Green	Green	Green	Green	Green	Green	Green	Green	Orange	Green
	Study instrument reliable and valid	Green	Green	Green	Green	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Green	Orange	Green	Orange
	Same mode of data collection used for all subjects	Green	Green	Orange	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	Length of shortest prevalence period	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	Numerator and denominator	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Summary		Green	Orange	Green	Green	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Green	Green	Green	Orange

Based on Risk of Bias Tool developed by Hoy et al. Green color indicates low risk of bias, orange color indicates moderate risk of bias