Supplementary Material

Quantifying Unmet Need for Hypertension Care in South Africa through a Care Cascade: Evidence from the SANHANES, 2011-2012

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Figures:

Tables:

* This supplementary material was provided by the authors to give readers further details on their article

Figure A1: Exclusion Criteria Flow Chart:

Raw SANHANES Sample
n= 26,806

- 9,186 under 15 years old
- 159 missing race
- 14 missing sex

Adult Interview Sample
n= 17,447

- 9,992 who did not consent to a physical examination

Adult Exam Sample
n=7,455

- 577 missing systolic or diastolic BP measurements

Examined adults with non-missing blood pressure measurements
n= 6,878

- 3 if SBP <70 mmHg or SBP > 270 mmHg
- 64 if DBP < 50 mmHg or DBP > 150

Examined adults with plausible blood pressure measurements
n= 6,811

- 554 missing response to question on ever being diagnosed with high BP
- 85 missing response on if they have ever had their blood pressure measures
- 301 missing response on blood pressure medication, given a self-reported diagnosis

Analytic Sample
5,871
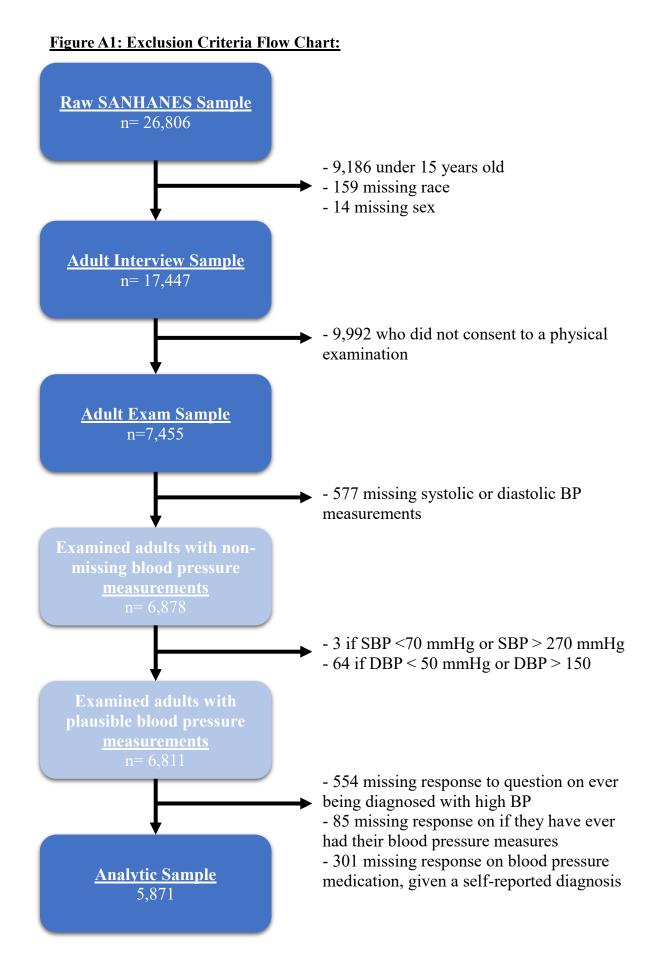
Table A1. Hypertension prevalence, screening, diagnosis, treatment and control, South African adults aged 15 and above, 2011-2012																		
	Total Hypertension		Unscreened, Undiagnosed			Screened, Undiagnosed			Diagnosed, Untreated			Treated, Uncontrolled			Treated, Controlled		
	Prev	SE	Prev	SE	% of hptn	Prev	SE	% of hptn	Prev	SE	% of hptn	Prev	SE	% of hptn	Prev	SE	% of hptn
Ages ≥ 15																	
Crude	35.0	1.3	13.0	0.8	37.1	8.4	1.0	24.1	2.4	0.3	6.9	7.3	0.5	21.0	3.8	0.5	11.0
Age-standardized	35.1	1.1	13.0	0.8	48.7	8.4	0.9	23.1	2.5	0.3	5.8	7.4	0.5	13.5	3.9	0.5	8.9
Age Categories																	
15-24	12.5	1.2	9.1	1.0	73.9	2.3	0.5	18.4	0.3	0.1	2.3	0.1	0.1	0.5	0.7	0.4	4.8
25-34	21.8	2.0	12.5	1.7	58.3	3.7	1.0	17.8	1.5	0.6	6.3	2.4	0.8	10.7	1.6	0.6	6.9
35-44	37.1	3.4	12.4	1.8	33.4	14.5	3.7	39.2	2.4	0.6	6.5	4.1	0.9	10.9	3.6	1.2	10.0
45-54	57.3	2.9	17.6	2.1	30.9	12.1	1.9	21.1	5.7	1.0	9.9	13.1	1.6	22.8	8.8	1.6	15.3
55-64	67.9	4.6	16.8	2.3	24.6	15.1	4.9	22.7	4.1	0.8	5.9	22.5	2.7	33.0	9.4	1.6	13.8
≥ 65	83.0	3.0	18.0	2.6	21.7	17.0	3.0	20.6	6.3	1.4	7.7	32.5	3.1	39.1	9.2	2.0	10.9
Sex																	
Men	35.2	1.7	16.9	1.4	58.5	8.5	1.1	23.2	2.9	0.5	6.9	4.8	0.5	7.9	2.1	0.4	3.5
Women	34.7	1.3	10.2	0.7	39.5	7.9	1.2	22.4	2.2	0.3	5.6	9.3	0.6	18.5	5.2	0.8	13.9
Sex by Age																	
Men																	
15-24	16.8	2.0	13.6	1.9	80.8	3.0	0.9	18.3	0.2	0.2	0.9	0.0	0.0	0.0	0.0	0.0	0.0
25-34	27.1	3.7	18.9	3.4	68.9	5.3	1.6	19.5	2.3	1.3	9.1	0.6	0.5	2.3	0.1	0.1	0.2
35-44	29.8	4.0	16.4	3.6	55.9	9.4	2.3	31.9	2.7	1.3	8.5	1.0	0.6	2.9	0.3	0.2	0.9
45-54	51.5	5.0	18.0	3.4	34.9	11.7	3.2	23.3	6.6	1.9	12.3	8.6	2.1	16.5	6.6	2.3	12.9
55-64	67.3	6.5	16.9	3.2	24.9	20.4	8.1	31.0	3.6	1.2	5.2	21.3	3.8	31.3	5.1	1.6	7.6
≥ 65	79.4	3.8	21.5	4.5	27.5	18.3	4.8	22.5	7.8	2.5	10.5	21.6	4.6	27.0	10.3	3.2	12.4
Women																	
15-24	8.8	1.4	5.3	1.0	62.3	1.7	0.7	18.7	0.4	0.2	4.6	0.2	0.1	1.4	1.3	0.6	13.1
25-34	18.1	2.2	8.1	1.3	43.4	2.6	0.8	17.2	1.0	0.4	4.9	3.6	1.3	21.8	2.7	1.0	12.8
35-44	41.1	4.6	10.2	1.8	24.5	17.3	5.3	42.0	2.3	0.7	5.8	5.8	1.3	14.1	5.4	1.8	13.6
45-54	61.8	3.5	17.1	2.5	27.8	12.6	2.3	20.3	4.8	1.1	7.8	16.7	1.8	27.0	10.6	2.1	17.1
55-64	68.4	3.6	17.2	2.6	25.4	8.9	1.9	13.0	4.7	1.0	6.8	24.2	2.9	35.4	13.4	2.5	19.4
≥ 65	84.3	3.4	14.8	2.2	17.5	15.1	4.2	18.0	5.1	1.5	6.0	41.6	4.1	49.4	7.6	1.6	9.1

Race																	
African	34.1	1.2	14.2	0.9	52.8	5.9	0.5	17.8	2.9	0.3	7.1	7.9	0.5	14.8	3.2	0.3	7.6
White	38.9	5.1	7.2	3.0	28.2	17.1	4.4	39.7	0.7	0.6	1.3	4.8	1.7	16.1	9.1	3.4	14.7
Coloured	41.1	1.6	13.1	1.3	39.5	11.2	1.2	31.9	2.2	0.4	3.8	10.0	0.8	14.7	4.6	0.8	10.1
Indian/Asian/Oth	28.7	2.8	8.0	2.2	54.7	7.3	1.8	21.6	1.6	0.7	3.2	7.0	1.1	11.6	4.8	0.9	8.9
Residential Location																	
Urban Formal	37.1	1.9	12.0	1.2	43.7	10.6	1.6	27.7	2.3	0.3	5.7	8.4	0.6	15.2	3.9	0.8	7.7
Urban Informal	30.3	2.6	13.3	2.2	57.0	4.2	1.0	14.8	2.8	0.9	5.8	5.8	1.3	13.4	4.2	0.9	9.0
Rural Informal	32.3	1.6	13.5	1.0	52.8	5.6	0.7	17.9	3.6	0.6	8.5	5.9	0.7	10.1	3.7	0.7	10.7
Rural Formal	39.6	1.7	18.1	2.4	52.6	7.9	1.1	23.4	1.5	0.6	3.1	7.1	1.5	10.5	5.1	1.1	10.4
BMI Category (kg/m2)																	
Underweight (BMI < 18.5)	20.4	2.5	11.9	2.2	73.9	3.8	1.2	11.0	0.2	0.2	0.4	2.4	0.9	7.8	2.0	0.7	6.9
Normal (18.5 ≤ BMI < 25)	30.7	1.7	14.0	1.3	56.5	7.9	1.3	22.8	2.4	0.5	7.1	3.8	0.5	7.7	2.6	0.5	5.9
Overweight (25 ≤ BMI < 30)	34.1	2.2	13.3	1.5	50.9	6.8	1.1	17.9	2.4	0.5	4.7	7.6	0.8	14.1	4.0	0.8	12.3
Obese (BMI ≥ 30)	43.4	2.3	13.3	1.9	36.0	9.7	1.5	25.2	3.3	0.6	7.6	11.0	1.0	19.0	6.0	1.4	12.2

Notes: Prev=prevalence, SE=Standard Error. Hypertension is defined as a blood pressure over 140/90 mmHg or currently taking antihypertensive medication. Estimates for the overall population and by sex, race, geography and BMI were age standardized using five-year age-categories between 15 and 74 and an open-ended category of 75 and above. Standard values were obtained from mid-year population estimates for 2012 (Statistics South Africa).

Table A2. Characteristics of the analytic study sample and the excluded participants

	All Excluded Observations from SANHANES Interview Sample, 2011-2012		Excluded Observations from SANHANES Exam Sample, 2011-2012		Final Analytic Sample SANHANES Exam Sample, 2011-2012	
	No.	%	No.	%	No.	%
Sex						
Men	5430	52.0	550	47.8	2066	43.4
Women	6146	48.0	1034	52.2	3805	56.6
Age Categories						
15-24	3299	27.2	406	26.4	1622	27.8
25-34	2554	26.5	250	21.1	999	25.4
35-44	1936	19.5	222	20.9	904	18.7
45-54	1680	13.0	263	16.2	920	12.3
55-64	1180	7.8	224	8.8	761	8.5
≥ 65	927	5.9	219	6.6	665	7.3
Race						
African	7384	75.0	1208	74.6	4100	77.5
White	674	13.0	31	12.9	122	9.9
Coloured	2183	8.5	260	7.3	1362	10.1
Indian or Asian	1335	3.5	85	5.2	287	2.6
Province						
Western Cape	1500	9.8	143	7.5	1042	13.7
Eastern Cape	1121	9.9	206	11.4	782	12.3
Northern Cape	720	1.6	51	1.1	401	2.6
Free State	703	5.2	303	12.0	287	3.6
KwaZulu-Natal	2161	16.3	230	20.9	872	18.6
North West	1482	9.3	265	6.8	594	6.3
Gauteng	2290	36.1	204	31.3	648	22.9
Mpumalanga	806	4.2	133	5.5	694	8.0
Limpopo	793	7.7	49	3.6	551	12.0
Sample Size (n)	11576		1584		5871	

Notes: The columns "All Excluded Observations from SANHANES interview sample" show all people excluded between the adult interview sample and the final analytic sample including those who did not complete a physical exam. The columns "Excluded observations from the SANHANES exam sample" show only the observations that were excluded from the exam sample based on criteria unique to this analysis. Sample weights were incorporated to adjust the percentage estimates in the SANHANES sample for unequal probabilities of selection and nonresponse in the physical examination component of the survey.