
KEEP 2011

Summary Figures

KEEP DATA ANALYSES

DIABETES

Self-reported diabetes, self reported diabetic retinopathy, receiving medication for diabetes, or elevated blood glucose (WHO); fasting blood sugar ≥ 126 mg/dl or non-fasting blood sugar ≥ 200 mg/dl, or A1c $\geq 7\%$ (if available)

SELF-REPORTED DIABETES

Self-reported diabetes or self-reported diabetic retinopathy

GLYCEMIC CONTROL

Fasting blood sugar < 126 mg/dl or non-fasting blood sugar < 200 mg/dl, and A1c $< 7\%$ (if available)

HYPERTENSION

Self reported history hypertension, receiving a medication for hypertension, or elevated blood pressure (JNC7): Diabetes or CKD; systolic ≥ 130 mmHg or diastolic ≥ 80 mmHg, otherwise systolic ≥ 140 mmHg or diastolic ≥ 90 mmHg

SELF-REPORTED HYPERTENSION

Self-reported hypertension

BLOOD PRESSURE CONTROL

Diabetes or CKD: systolic < 130 mmHg and diastolic < 80 mmHg, otherwise systolic < 140 mmHg and diastolic < 90 mmHg

HIGH CHOLESTEROL

Self-reported high cholesterol or receiving medication for cholesterol, or cholesterol level > 200 mg/dl

SELF-REPORTED HIGH CHOLESTEROL

Self-reported high cholesterol

CHOLESTEROL CONTROL

Total cholesterol levels of ≤ 200 mg/dl

SELF-REPORTED CARDIOVASCULAR DISEASE

Participant reports any of the following cardiac events: heart attack, bypass surgery, heart angioplasty, stroke, heart failure, abnormal heart rhythm, or PVD (only for KEEP version 2)

MICROALBUMINURIA

Albumin/creatinine ratio ≥ 30 mg/g

CHRONIC KIDNEY DISEASE

eGFR < 60 mL/min/1.73 m² or eGFR ≥ 60 mL/min/1.73 m² and albumin-creatinine ratio (ACR) ≥ 30 mg/g. GFR estimated using the IDMS-traceable 4-variable Modification of Diet in Renal Disease (MDRD) Study equation or Chronic Kidney Disease Epidemiology Collaboration equation (CKD-EPI) for calibrated serum creatinine (Scr) values

CKD STAGES

Stage 1: eGFR ≥ 90 mL/min/1.73 m², and ACR ≥ 30 mg/g
 Stage 2: eGFR 60–89 mL/min/1.73 m², and ACR ≥ 30 mg/g
 Stage 3: eGFR 30–59 mL/min/1.73 m²
 Stage 4: eGFR 15–29 mL/min/1.73 m²
 Stage 5: eGFR < 15 mL/min/1.73 m²

ANEMIA**WHO**

Male: hemoglobin < 13 g/dl
 Female: < 12 g/dl

KDOQI (2006)

Males: hemoglobin < 13.5 g/dl
 Women < 12 g/dl

BODY MASS INDEX CATEGORIES

UW: underweight, BMI < 18.5
 N: normal, BMI 18.5–24.9
 OW: overweight, BMI 25–29.9
 OB: obese, BMI 30–39.9
 EOB: extremely obese, BMI ≥ 40

EDUCATIONAL STATUS

GSL: Grade school or less
 SHS: Some high school
 HSG: High school graduate
 SC+: Some college, college graduate, post-graduate

NHANES 1999–2006 DATA ANALYSES

SELF-REPORTED DIABETES

To be classified as having self-reported diabetes, participants had to report being told by a doctor, at any time, that they had diabetes or sugar diabetes other than that related to pregnancy. Participants answering “borderline” to the question were classified as non-diabetic.

SELF-REPORTED HYPERTENSION

Self-reported hypertension was identified by an affirmative answer to the question: “Have you ever been told by a doctor that you had hypertension, also called high blood pressure.”

SELF-REPORTED HIGH CHOLESTEROL

Self-reported high cholesterol was identified by an affirmative answer to the question: “Have you ever been told by a doctor or other health professional that your blood cholesterol level was high?”

SELF-REPORTED CARDIOVASCULAR DISEASE

Participant reports any of the following cardiac events: coronary heart disease, angina/angina pectoris, heart attack, congestive heart failure, or stroke.

MICROALBUMINURIA

Albumin/creatinine ratio ≥ 30 mg/g

CHRONIC KIDNEY DISEASE

eGFR < 60 mL/min/1.73 m² or eGFR ≥ 60 mL/min/1.73 m² and albumin-creatinine ratio (ACR) ≥ 30 mg/g. GFR estimated using the IDMS-traceable 4-variable Modification of Diet in Renal Disease (MDRD) Study equation or Chronic Kidney Disease Epidemiology Collaboration equation (CKD-EPI) for calibrated serum creatinine (Scr) values

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Stage 1: eGFR ≥ 90 mL/min/1.73 m², and ACR ≥ 30 mg/g
 Stage 2: eGFR 60–89 mL/min/1.73 m², and ACR ≥ 30 mg/g
 Stage 3: eGFR 30–59 mL/min/1.73 m²
 Stage 4: eGFR 15–29 mL/min/1.73 m²
 Stage 5: eGFR < 15 mL/min/1.73 m²

ANEMIA**WHO**

Male: hemoglobin < 13 g/dl
 Female: < 12 g/dl

KDOQI (2006)

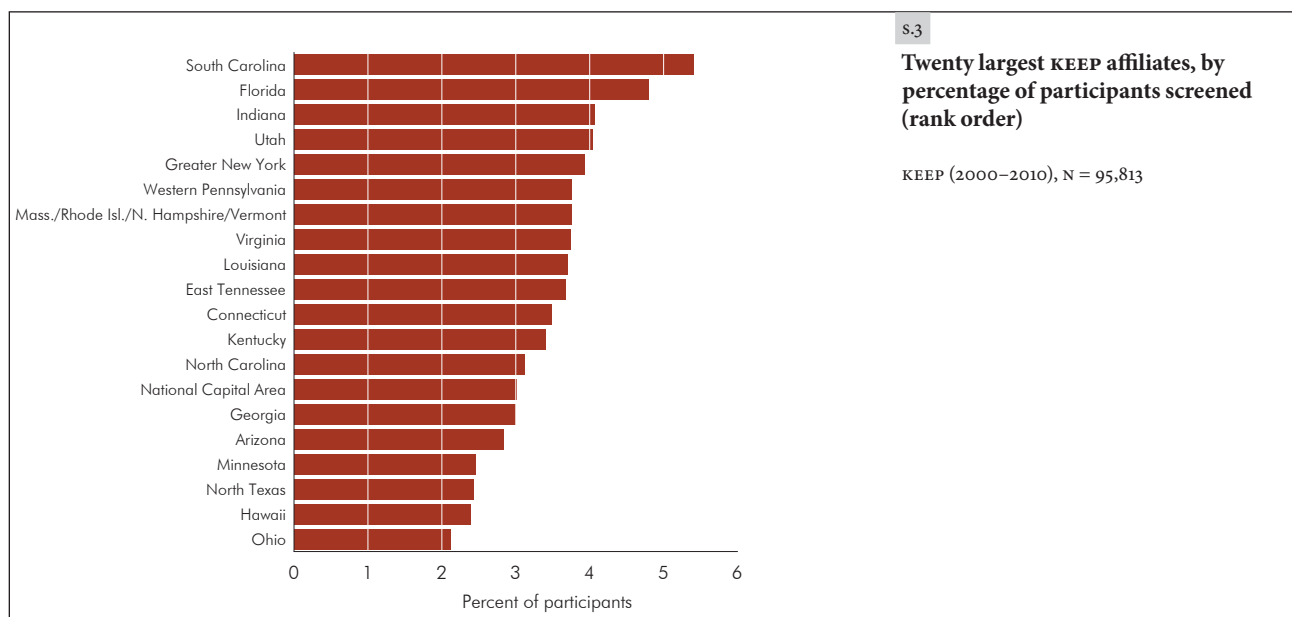
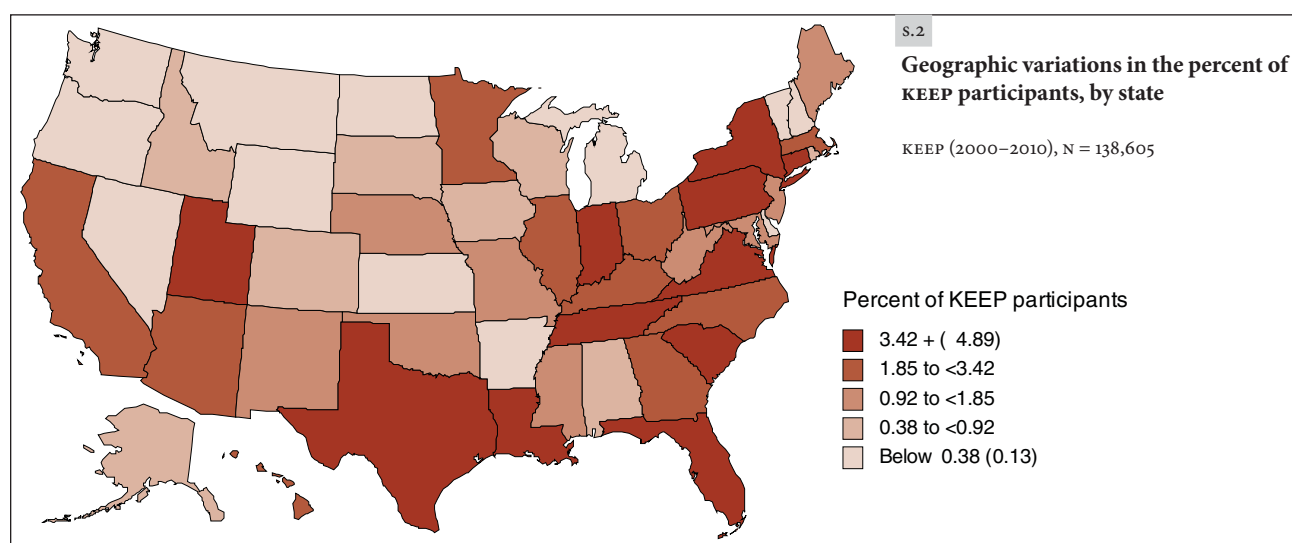
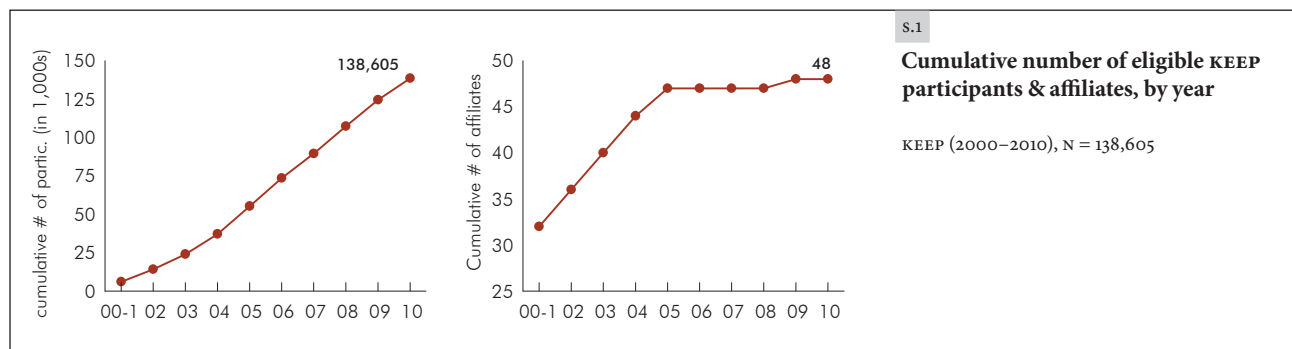
Males: hemoglobin < 13.5 g/dl
 Women < 12 g/dl

BODY MASS INDEX CATEGORIES

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EDUCATIONAL STATUS

GSL: Grade school or less
 HSG: High school graduate
 SC+: Some college, college graduate, post graduate



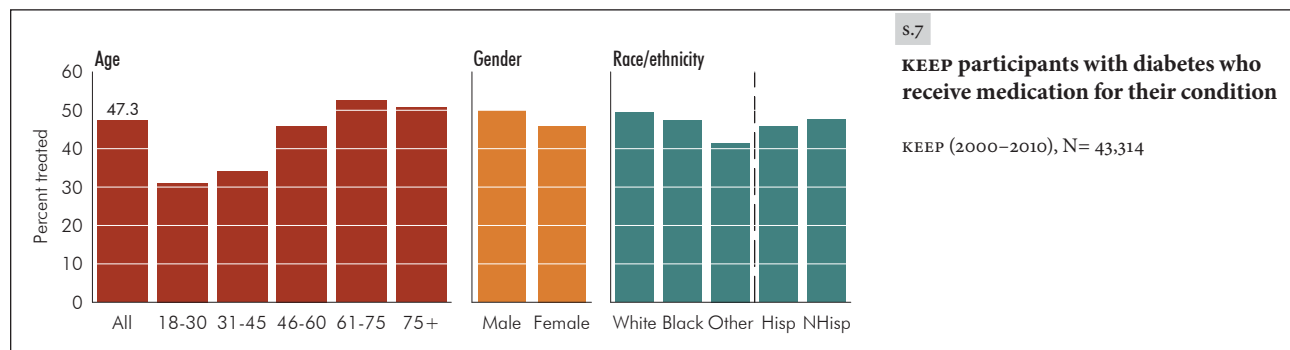
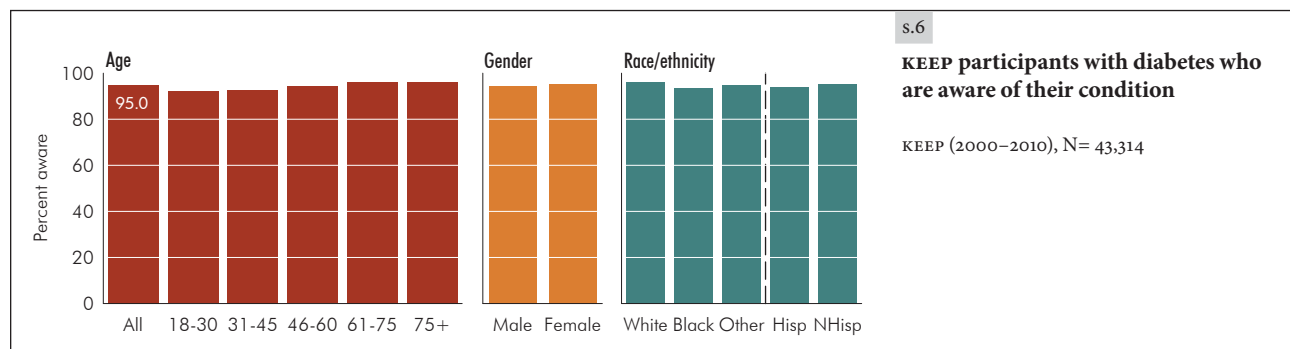
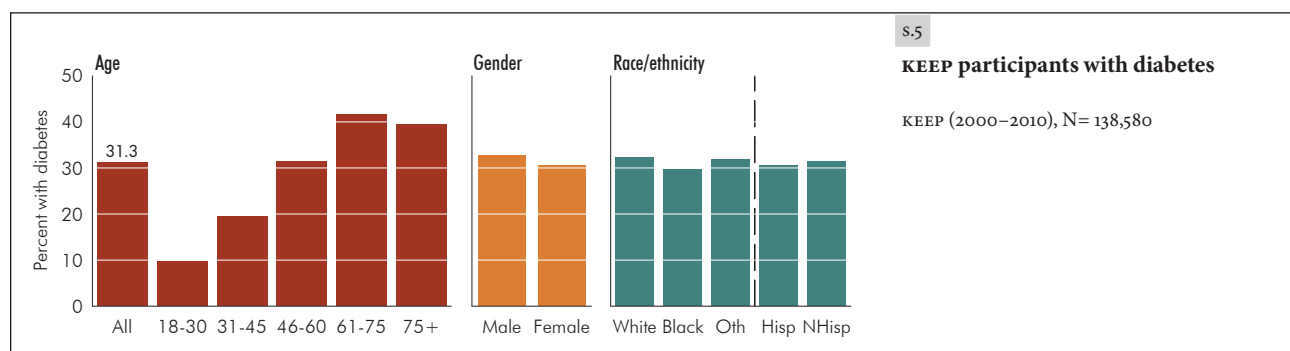
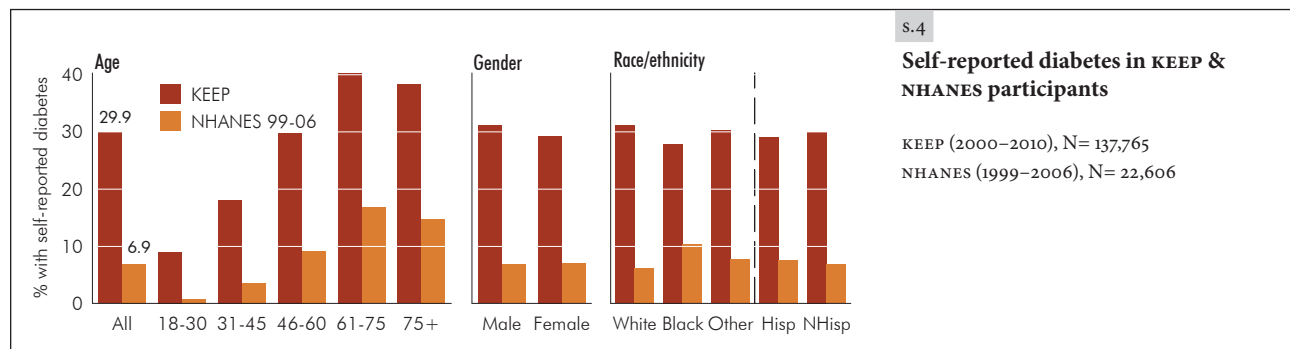
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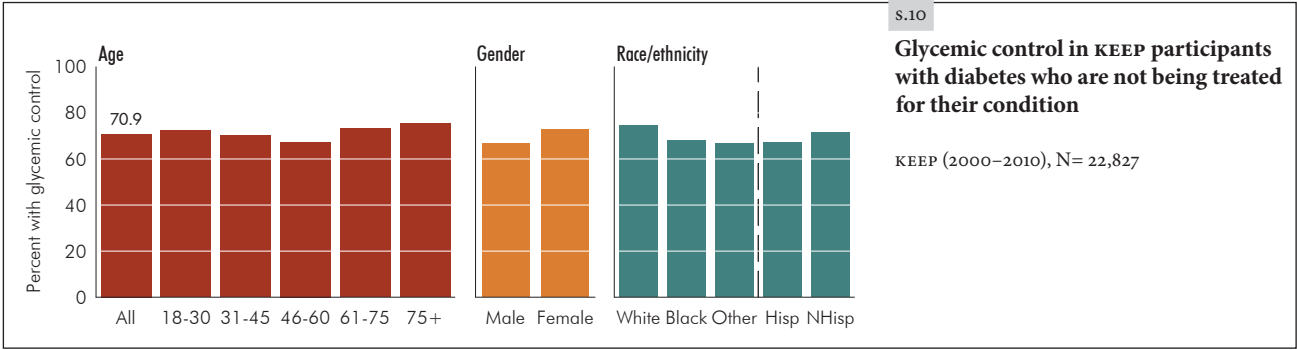
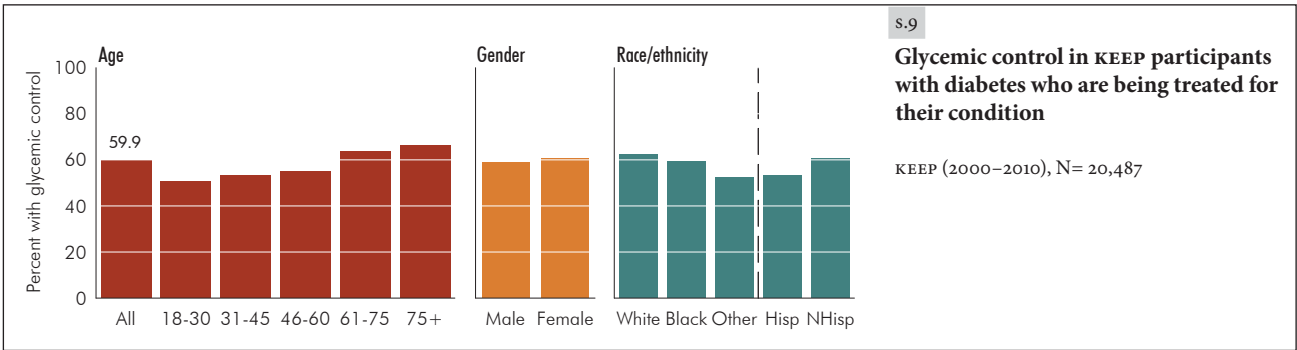
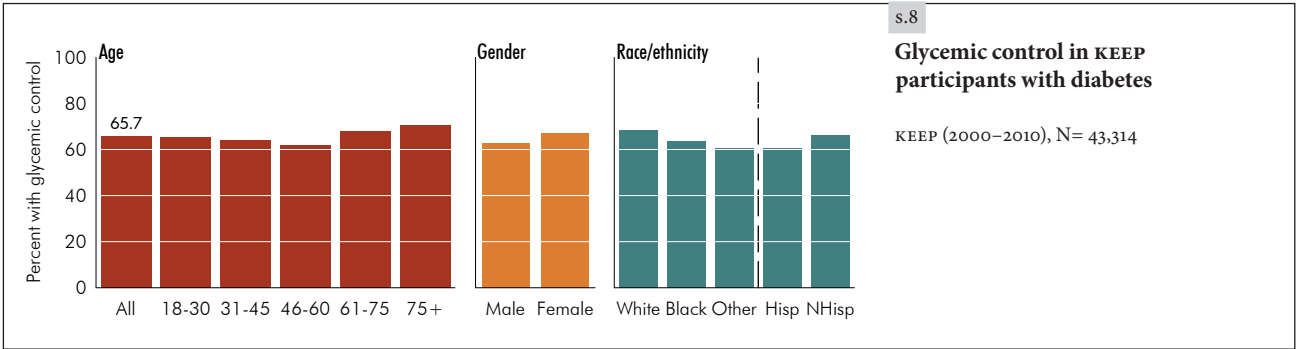
Total eligible KEEP participants, by year

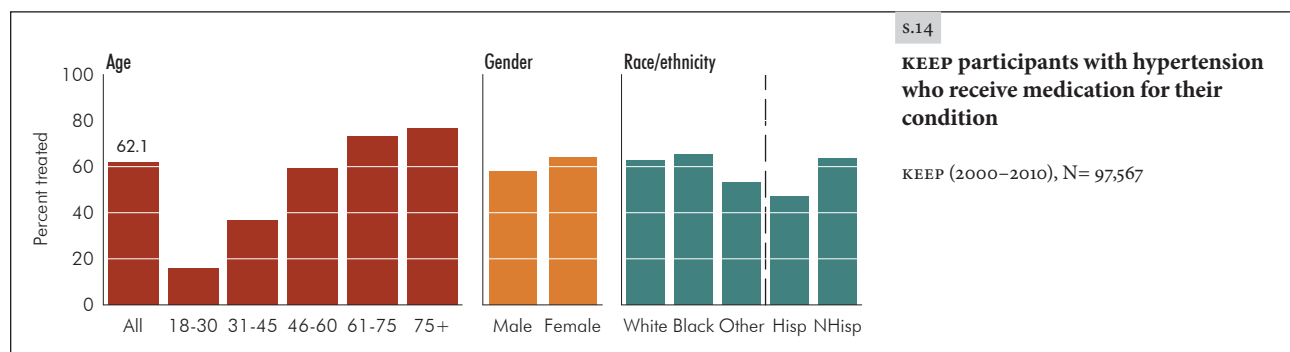
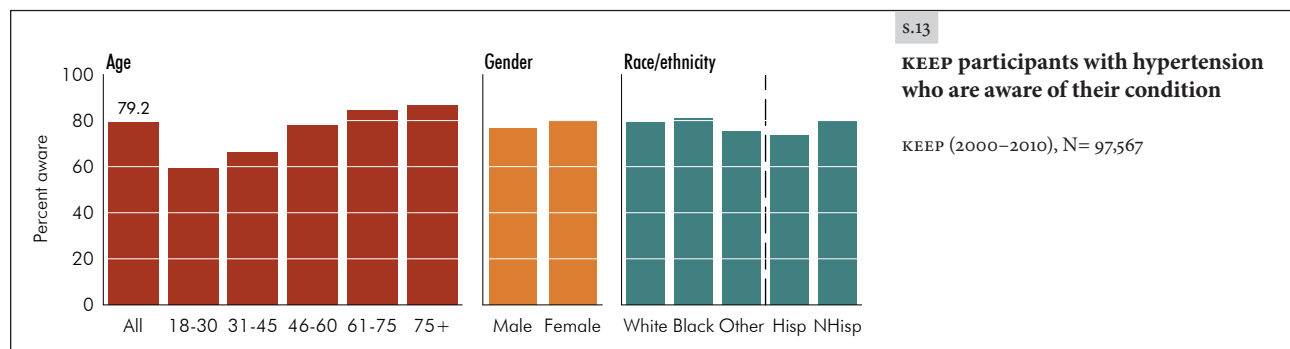
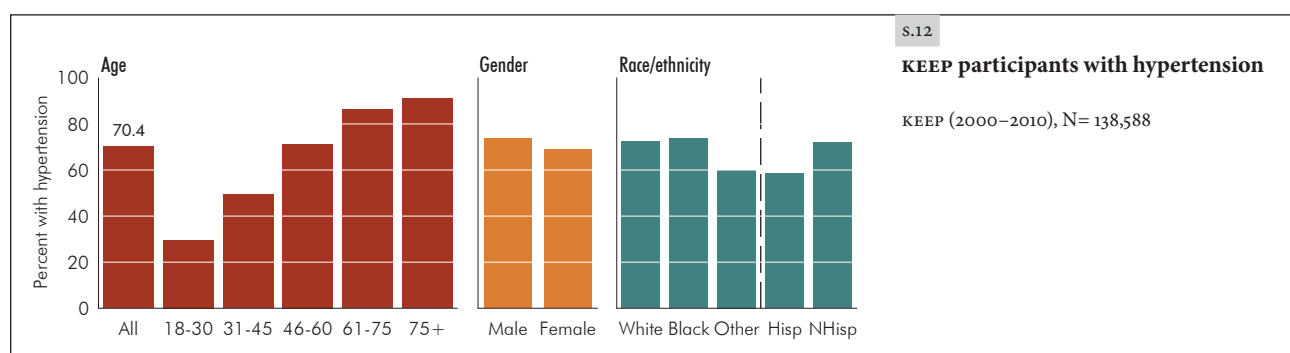
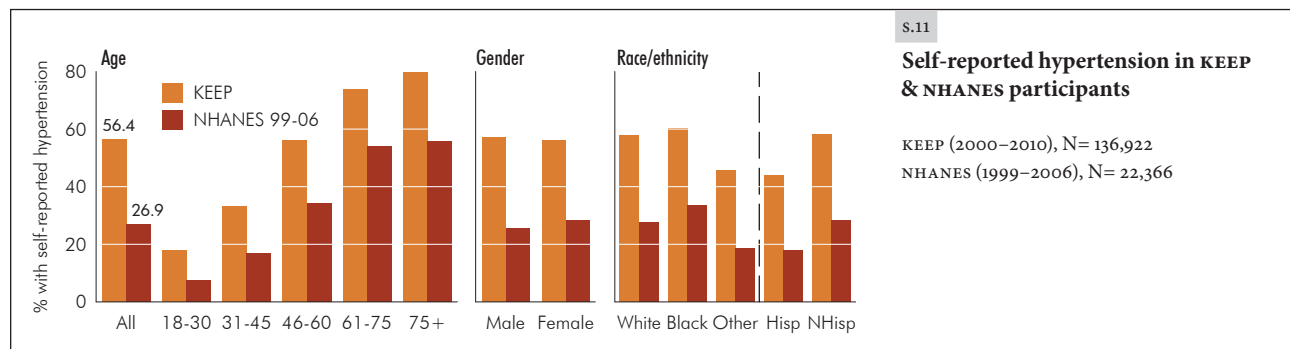
KEEP (2000–2010), N = 138,605

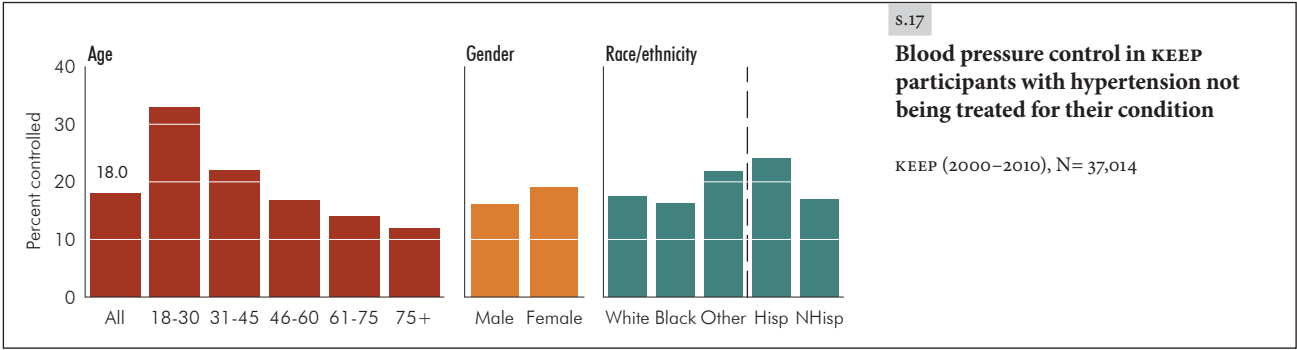
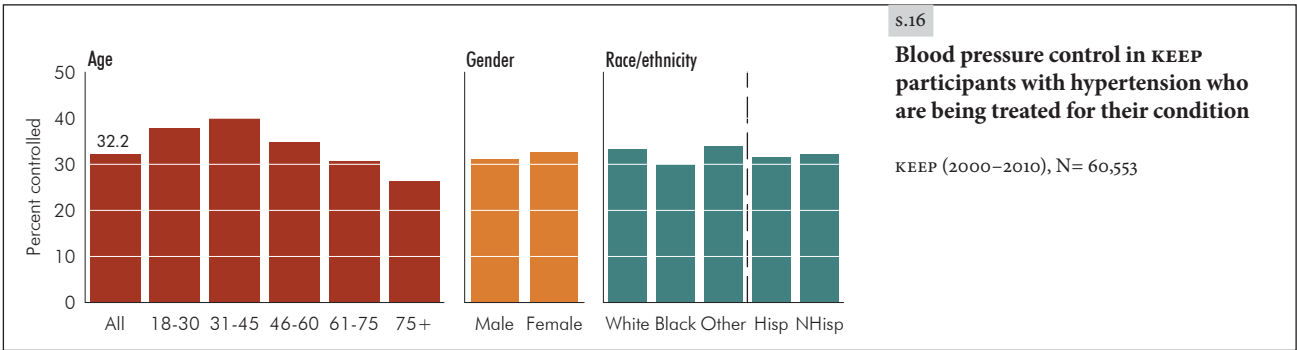
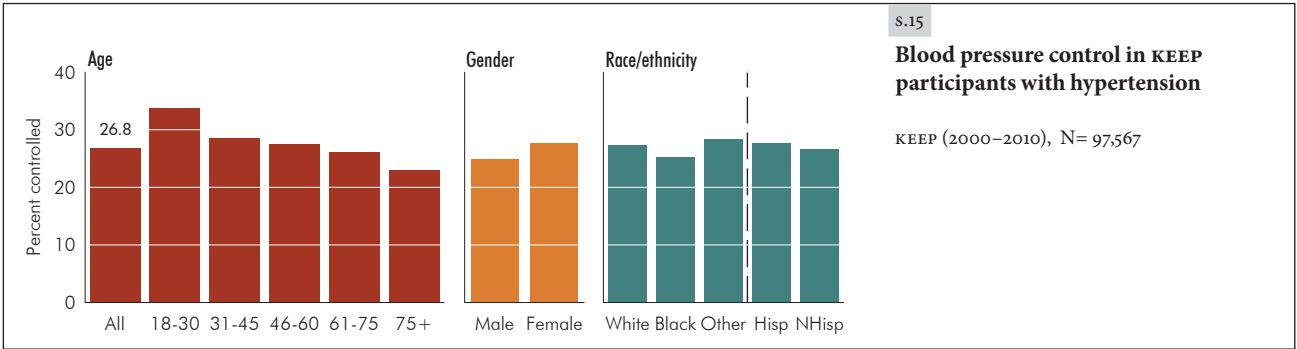
		2000+2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	All	All (%)
Age	18-30	568	644	1,004	1,085	1,391	1,257	989	1,077	1,019	701	9,735	7.0
	31-45	1,491	1,977	2,393	2,939	3,984	3,685	2,870	3,004	2,697	2,135	27,175	19.6
	46-60	2,097	2,651	3,422	4,690	6,438	6,592	5,509	6,113	5,949	4,824	48,285	34.8
	61-75	1,502	2,029	2,382	3,328	4,769	5,111	4,968	5,562	5,575	4,663	39,889	28.8
	>75	424	743	721	1,076	1,547	1,656	1,683	1,938	1,959	1,774	13,521	9.8
	Missing	.	.	.	.	.	.	.	.	.	.	.	.
Gender	Male	1,959	2,570	2,944	4,142	5,879	5,684	5,207	5,805	5,547	4,464	44,201	31.9
	Female	4,123	5,473	6,976	8,975	12,192	12,613	10,808	11,889	11,650	9,629	94,328	68.1
	Missing	.	1	2	1	58	4	4	.	2	4	76	0.1
Race	White	2,284	3,104	4,301	5,793	9,028	9,008	8,131	9,261	8,738	7,251	66,899	48.3
	Black	2,652	3,392	3,430	4,274	5,267	5,565	5,041	5,402	5,479	4,476	44,978	32.5
	Native American	324	575	686	818	723	434	346	153	275	132	4,466	3.2
	Asian	172	263	423	477	952	1,228	851	1,076	875	850	7,167	5.2
	Pacific Islander	55	133	113	45	92	24	12	114	52	75	715	0.5
	Other	416	387	629	1,629	1,647	1,256	1,123	1,307	1,708	1,255	11,357	8.2
	Unknown/missing	179	190	340	82	420	786	515	381	72	58	3,023	2.2
Ethnicity	Hispanic	618	712	1,117	1,890	2,416	2,317	2,075	2,163	2,317	1,851	17,476	12.6
	Non-Hispanic	5,464	7,332	8,805	11,228	15,713	15,984	13,944	15,531	14,882	12,246	121,129	87.4
Education Level	<12 years	948	1,277	1,420	2,002	2,830	2,782	2,469	2,454	2,353	1,758	20,293	14.6
	12 years	1,585	2,192	2,591	3,491	4,611	4,462	4,190	4,531	4,527	3,730	35,910	25.9
	>12 years	1,629	2,155	2,775	3,459	4,675	4,351	3,815	4,504	4,272	3,506	35,141	25.4
	16 years	1,143	1,463	1,913	2,530	3,614	3,814	3,228	3,682	3,738	3,274	28,399	20.5
	>16 years	688	862	1,132	1,467	2,145	2,453	2,019	2,299	2,117	1,769	16,951	12.2
	Missing	89	95	91	169	254	439	297	224	192	60	1,910	1.4
Health Insurance Status	Yes	4,948	6,428	7,892	10,153	14,056	14,207	12,404	13,631	12,579	10,577	106,875	77.1
	No	883	1,234	1,660	2,490	3,251	3,371	3,292	3,525	3,880	3,196	26,782	19.3
	Missing	251	382	370	475	822	723	318	536	740	323	4,940	3.6
All		6,082	8,044	9,922	13,118	18,129	18,301	16,019	17,694	17,199	14,097	138,605	100

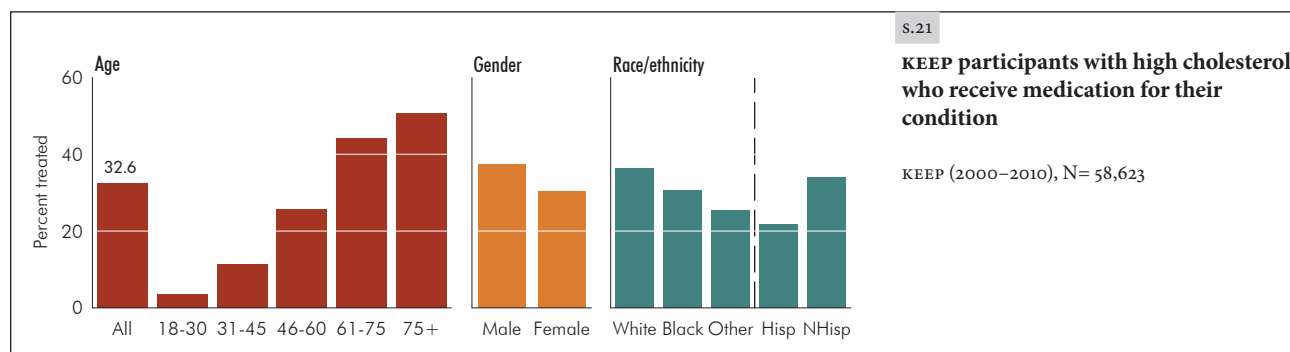
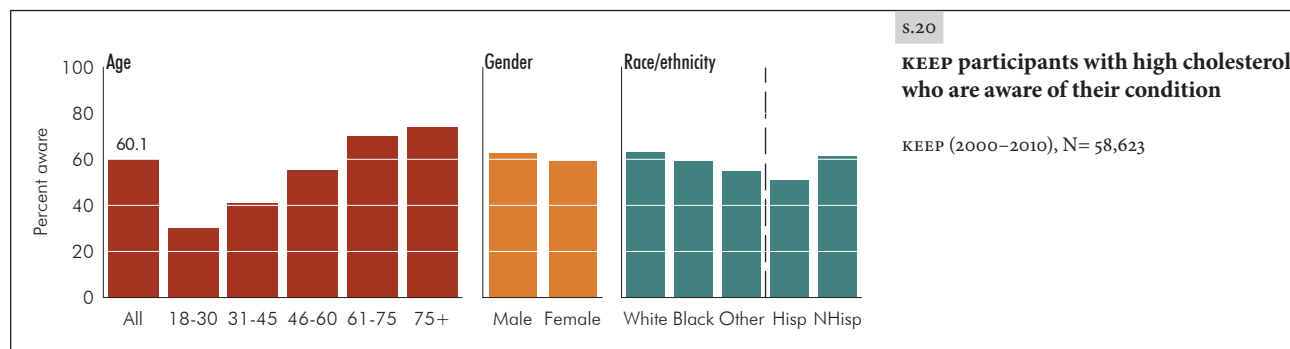
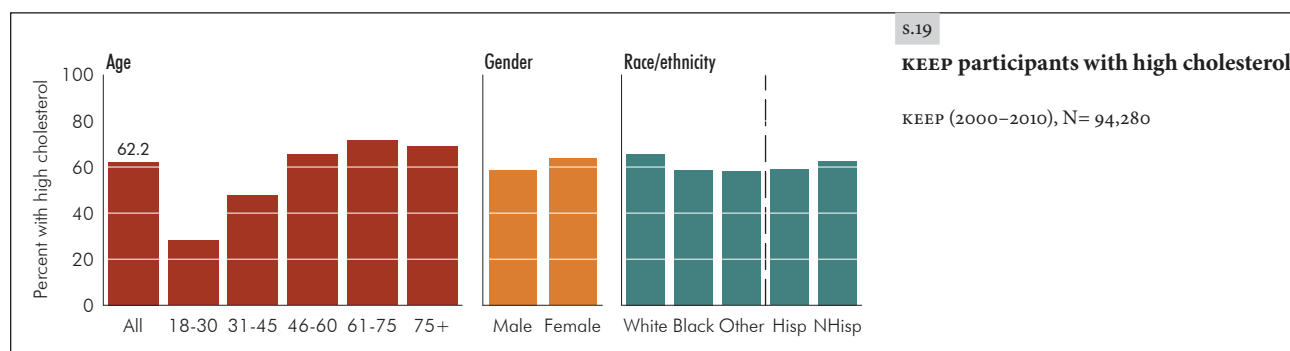
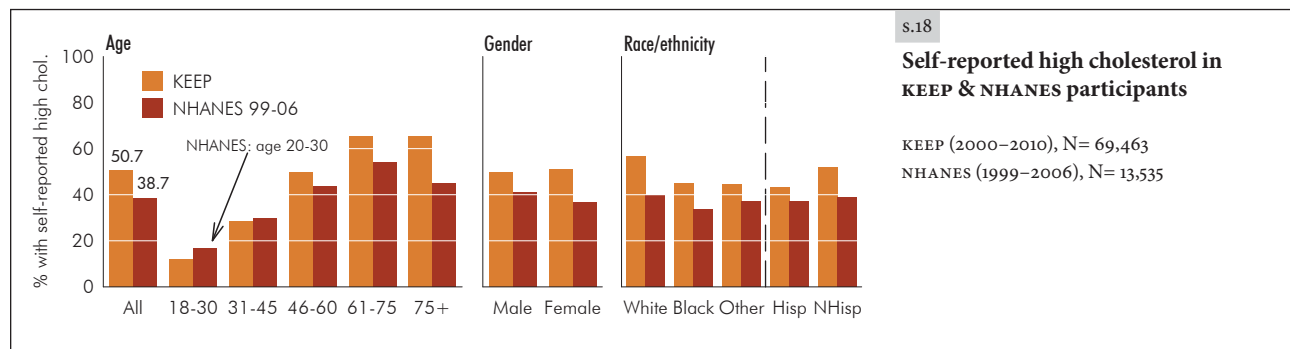
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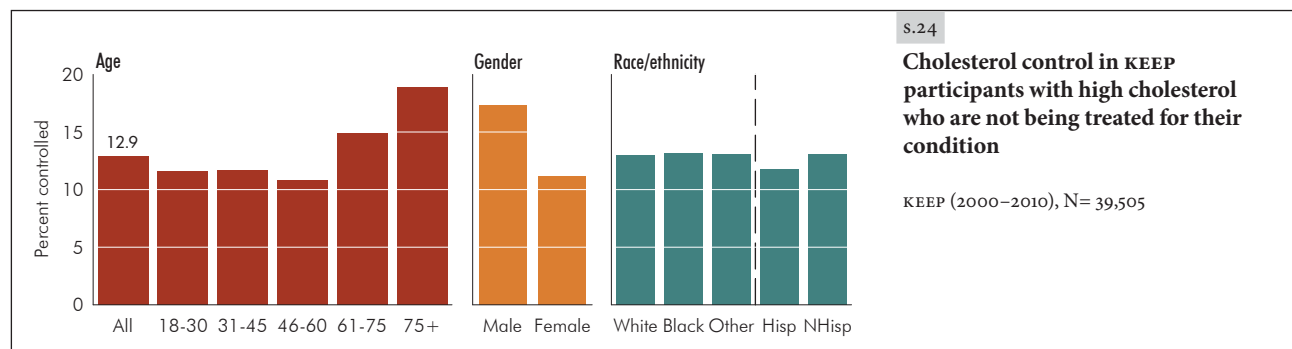
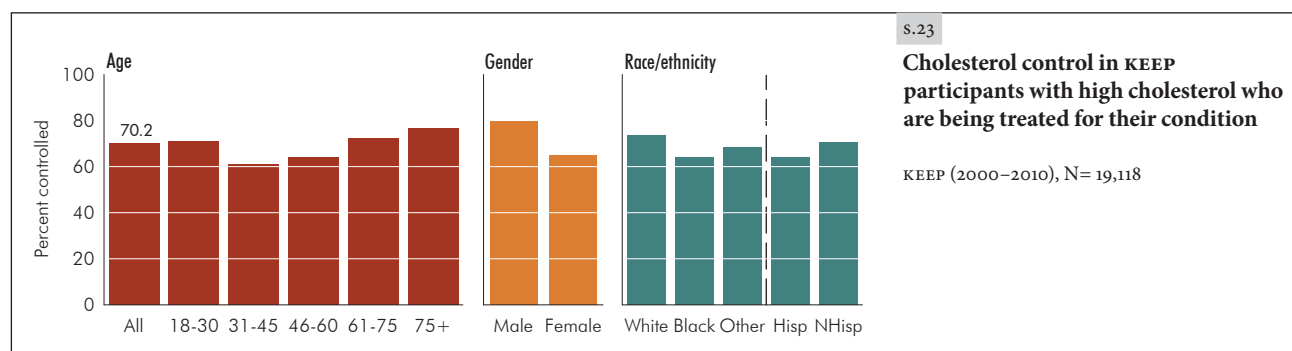
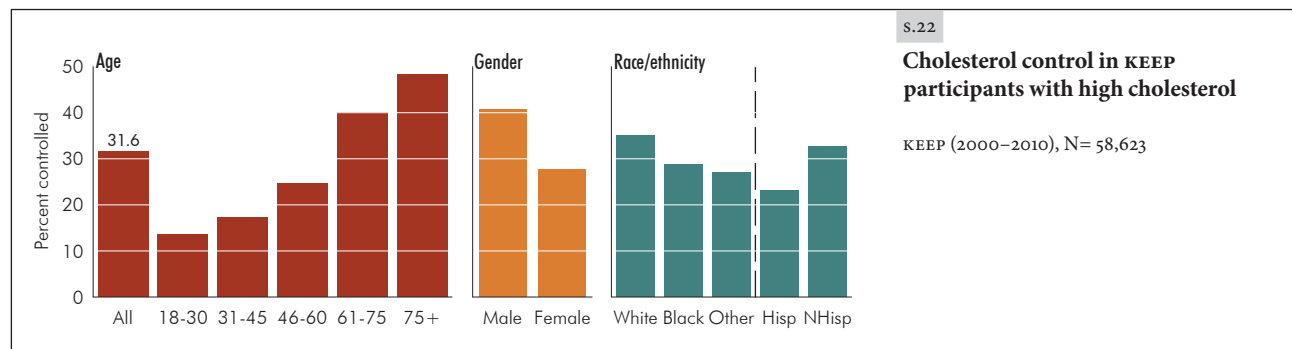


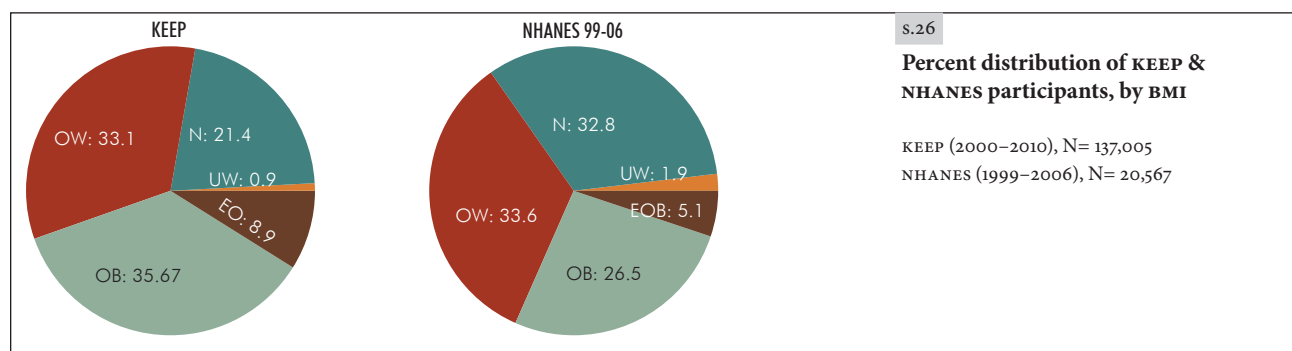
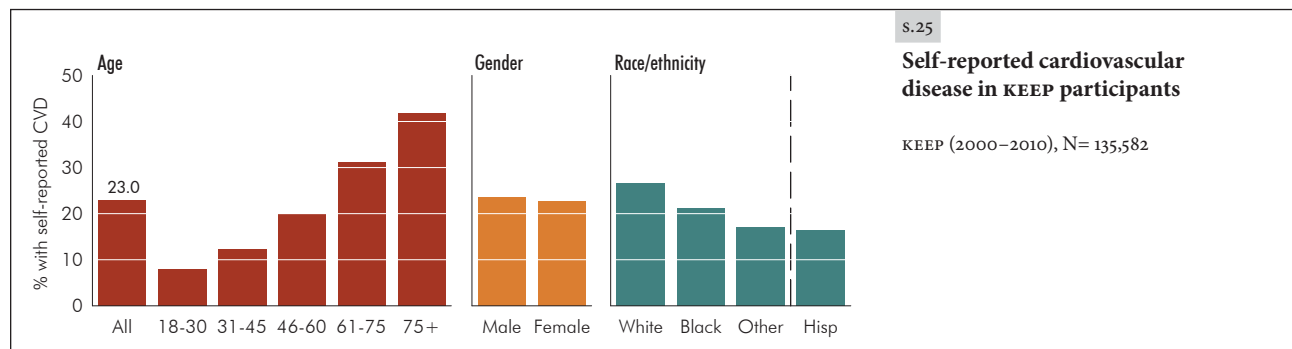


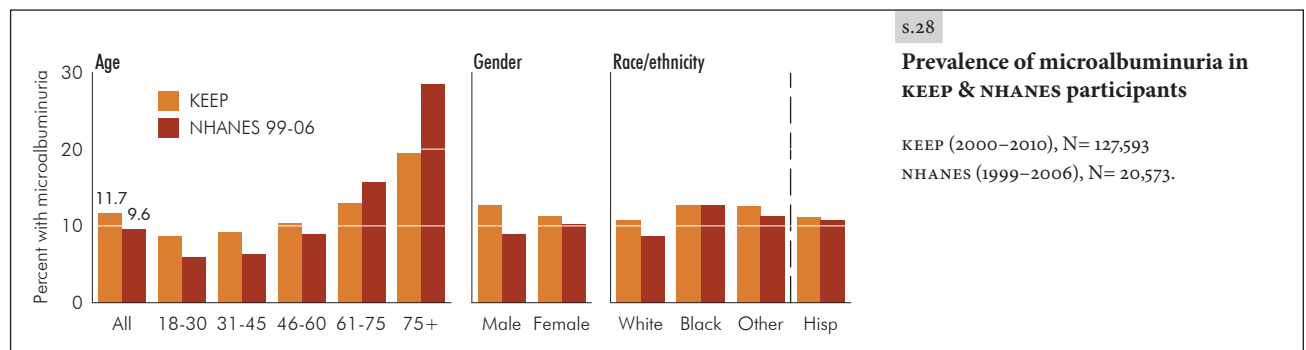
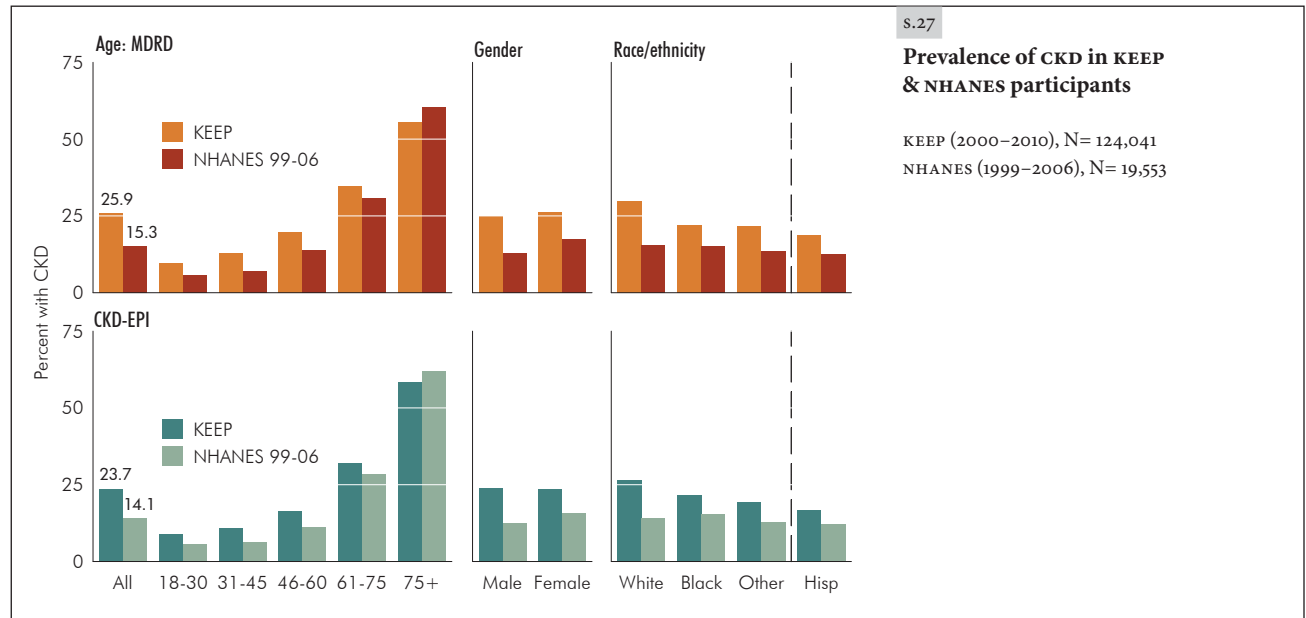












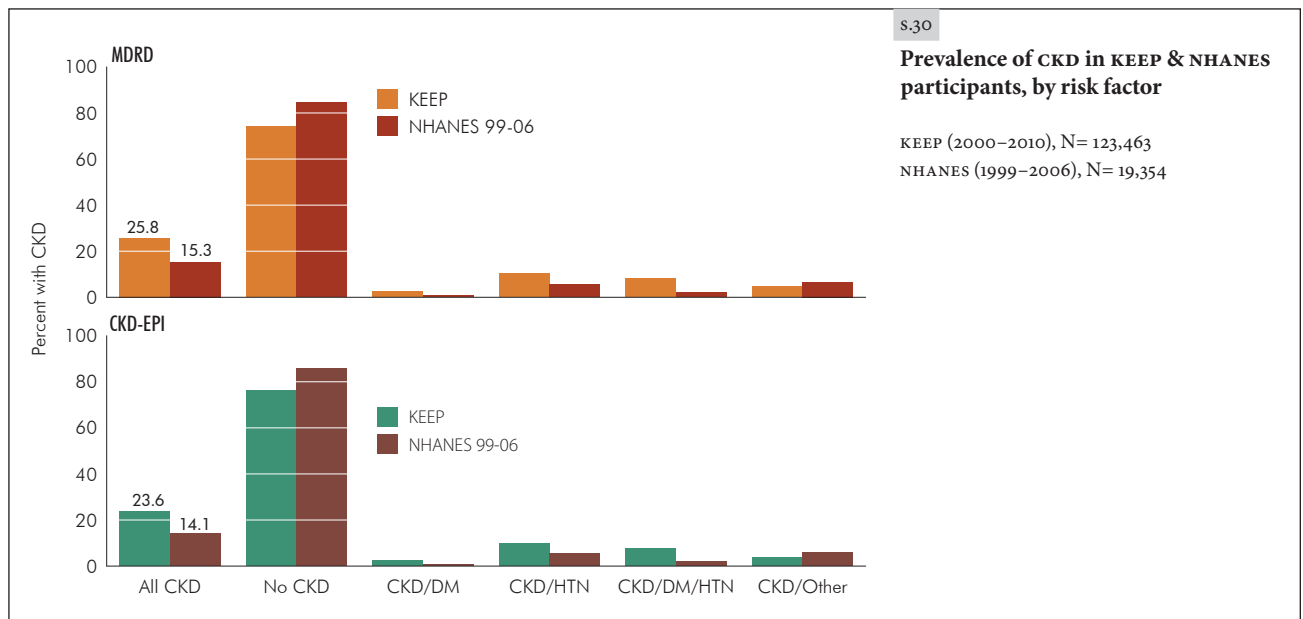
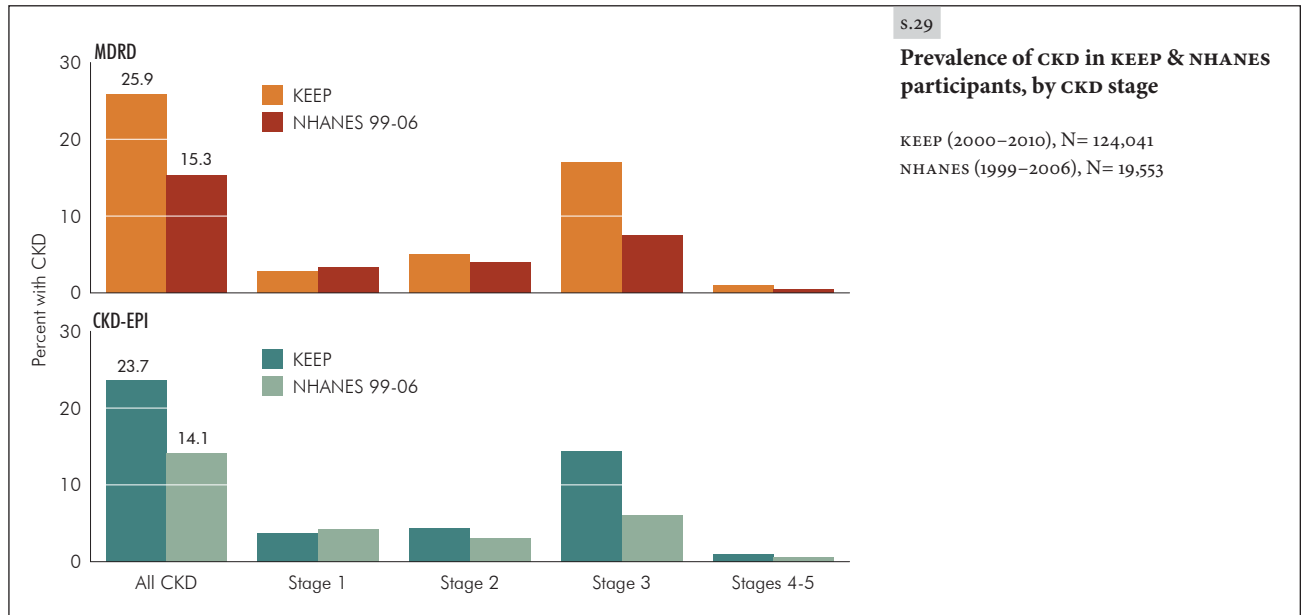
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Total eligible KEEP participants with CKD, by CKD stage: MDRD equation

KEEP (2000–2010), N= 138,605

	Non-CKD	Stage 1 & Abnormal ACR	Stage 2 & Abnormal ACR	Stage 3	Stages 4-5	Missing	All
Age							
18-30	7,489	462	198	139	17	1,430	9,735
31-45	20,465	970	942	1,129	68	3,601	27,175
46-60	34,634	1,403	2,046	4,927	243	5,032	48,285
61-75	23,799	617	2,174	9,551	468	3,280	39,889
>75	5,584	115	848	5,635	438	901	13,521
Gender							
Male	29,604	1,052	2,158	6,300	459	4,628	44,201
Female	62,367	2,515	4,050	15,081	775	9,540	94,328
Missing	.	.	.	.	.	76	76
Race							
White	43,417	1,065	2,911	14,079	714	4,713	66,899
Black	30,731	1,629	2,121	4,624	304	5,569	44,978
Native American	2,791	226	247	598	59	545	4,466
Asian	5,320	194	320	776	63	494	7,167
Pacific Islander	421	23	63	117	13	78	715
Other	8,392	385	493	1,096	78	913	11,357
Unknown/missing	899	45	53	91	3	1,932	3,023
Ethnicity							
Hispanic	12,121	595	660	1,446	94	2,560	17,476
Non-Hispanic	79,850	2,972	5,548	19,935	1,140	11,684	121,129
U.S. Census Region							
Northeast	22,070	834	1,526	5,154	281	3,063	32,928
Midwest	13,617	537	923	3,442	192	1,989	20,700
South	42,780	1,725	2,840	9,198	525	7,435	64,503
West	13,483	471	919	3,581	236	1,746	20,436
Missing	21	.	.	6	.	11	38
U.S. Census Division							
New England	7,113	241	483	1,905	89	1,666	11,497
Middle Atlantic	14,957	593	1,043	3,249	192	1,397	21,431
East North Central	8,619	374	595	1,953	110	1,003	12,654
West North Central	4,998	163	328	1,489	82	986	8,046
South Atlantic	22,014	877	1,444	4,824	258	4,279	33,696
East South Central	11,370	406	766	2,578	128	1,369	16,617
West South Central	9,396	442	630	1,796	139	1,787	14,190
Mountain	7,683	248	492	2,431	128	924	11,906
Pacific	5,800	223	427	1,150	108	822	8,530
Missing	21	.	.	6	.	11	38
Smoking							
Yes	34,397	1,483	2,657	8,724	548	5,571	53,380
No	54,736	1,952	3,365	11,984	647	7,812	80,496
Missing	2,838	132	186	673	39	861	4,729
Education Level							
< 12 years	12,256	654	1,071	3,595	269	2,448	20,293
12 years	22,935	970	1,708	6,328	385	3,584	35,910
>12 years	23,650	927	1,516	5,091	293	3,664	35,141
16 years	20,230	677	1,146	3,537	162	2,647	28,399
>16 years	11,807	294	664	2,550	110	1,526	16,951
Missing	1,092	45	103	280	15	375	1,910
Health Insurance Status							
Yes	69,623	2,366	4,791	18,275	1,031	10,789	106,875
No	19,388	1,059	1,201	2,224	148	2,762	26,782
Missing	2,952	142	216	882	55	693	4,940
Doctor Status							
Yes	79,143	2,967	5,563	20,072	1,150	11,841	120,736
No	11,175	523	535	948	56	1,928	15,165
Missing	1,653	77	110	361	28	475	2,704
All	91,971	3,567	6,208	21,381	1,234	14,244	138,605

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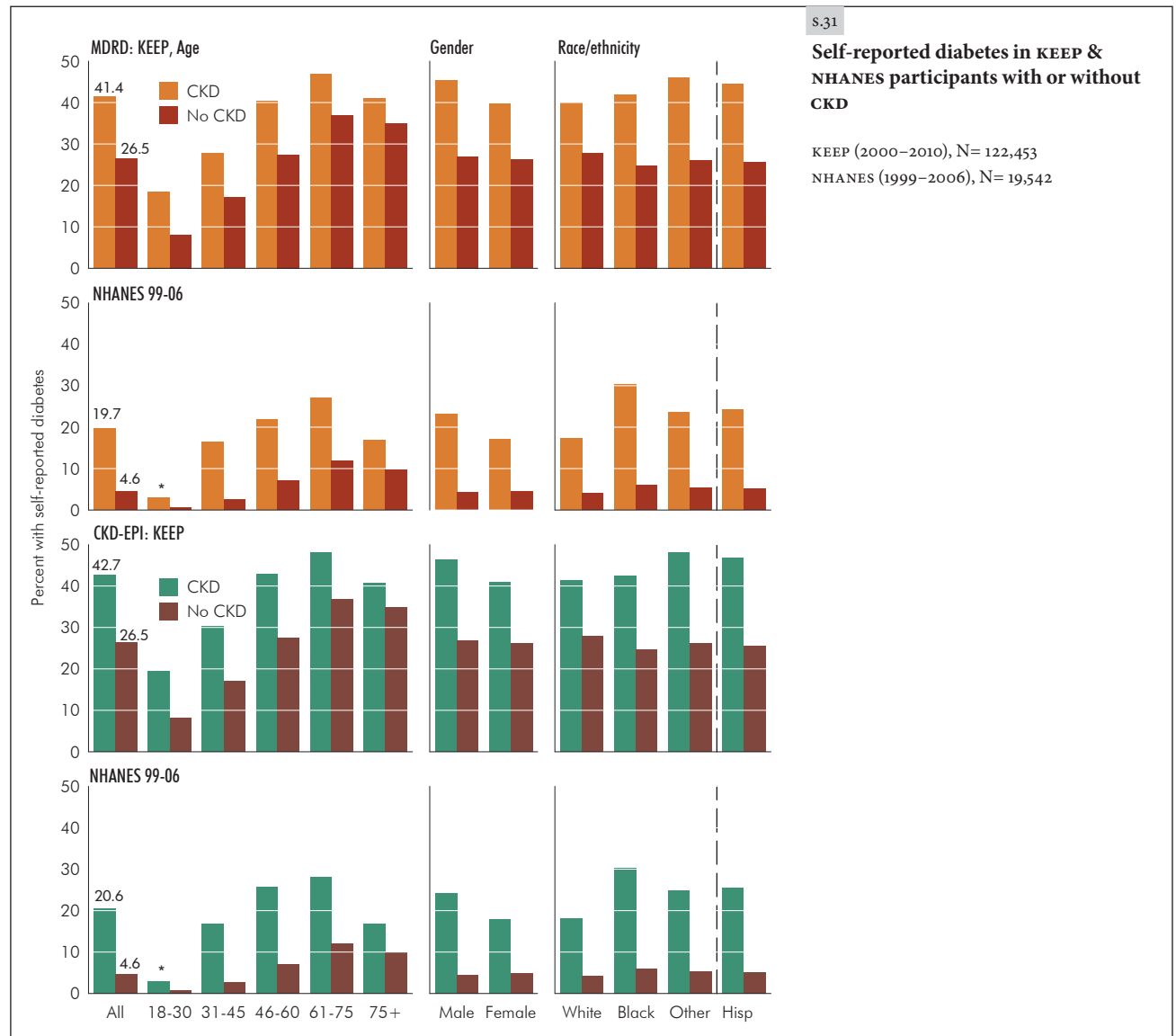
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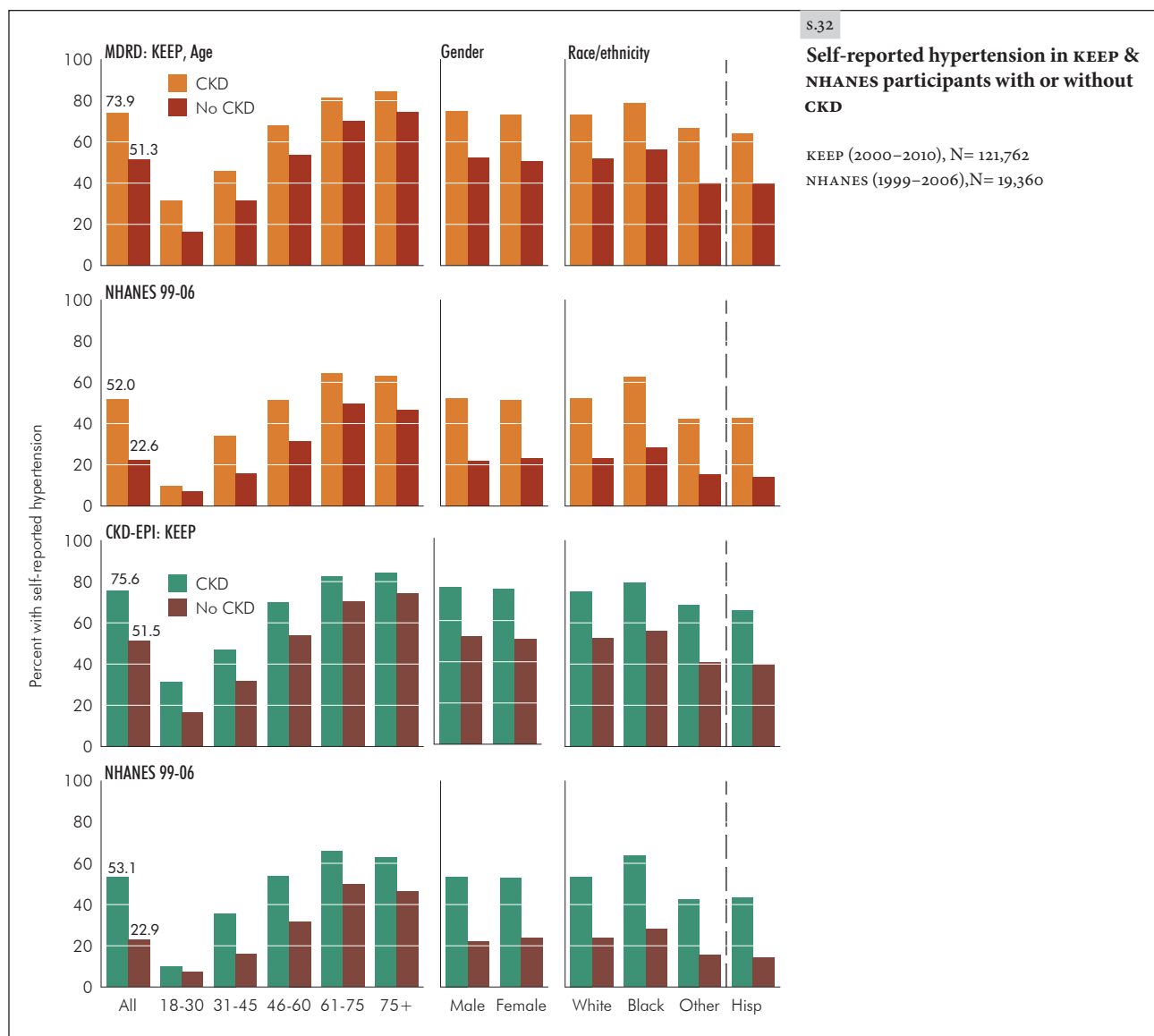
Total eligible KEEP participants with CKD, by CKD stage: CKD-EPI equation

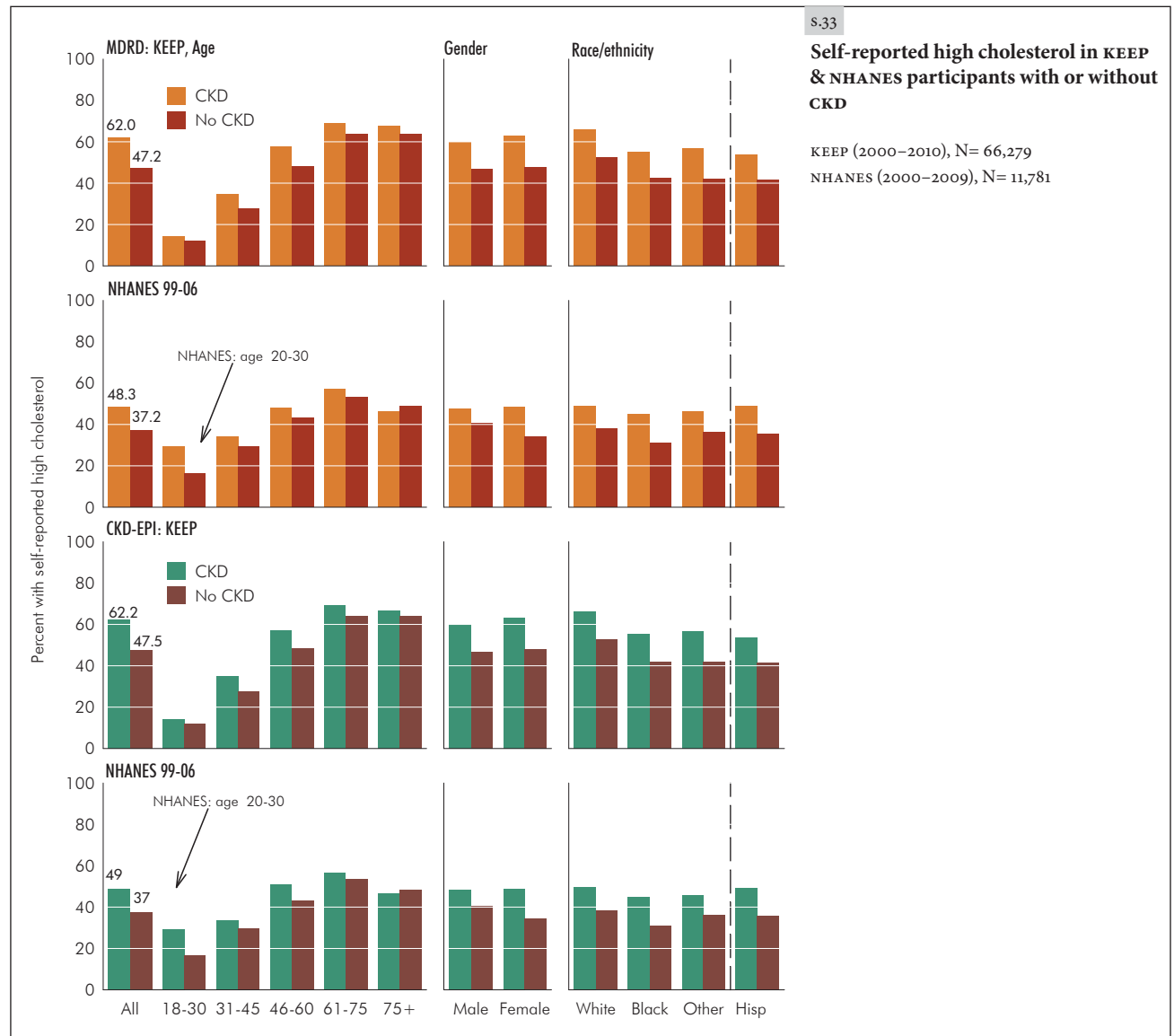
KEEP (2000–2010), N= 138,605

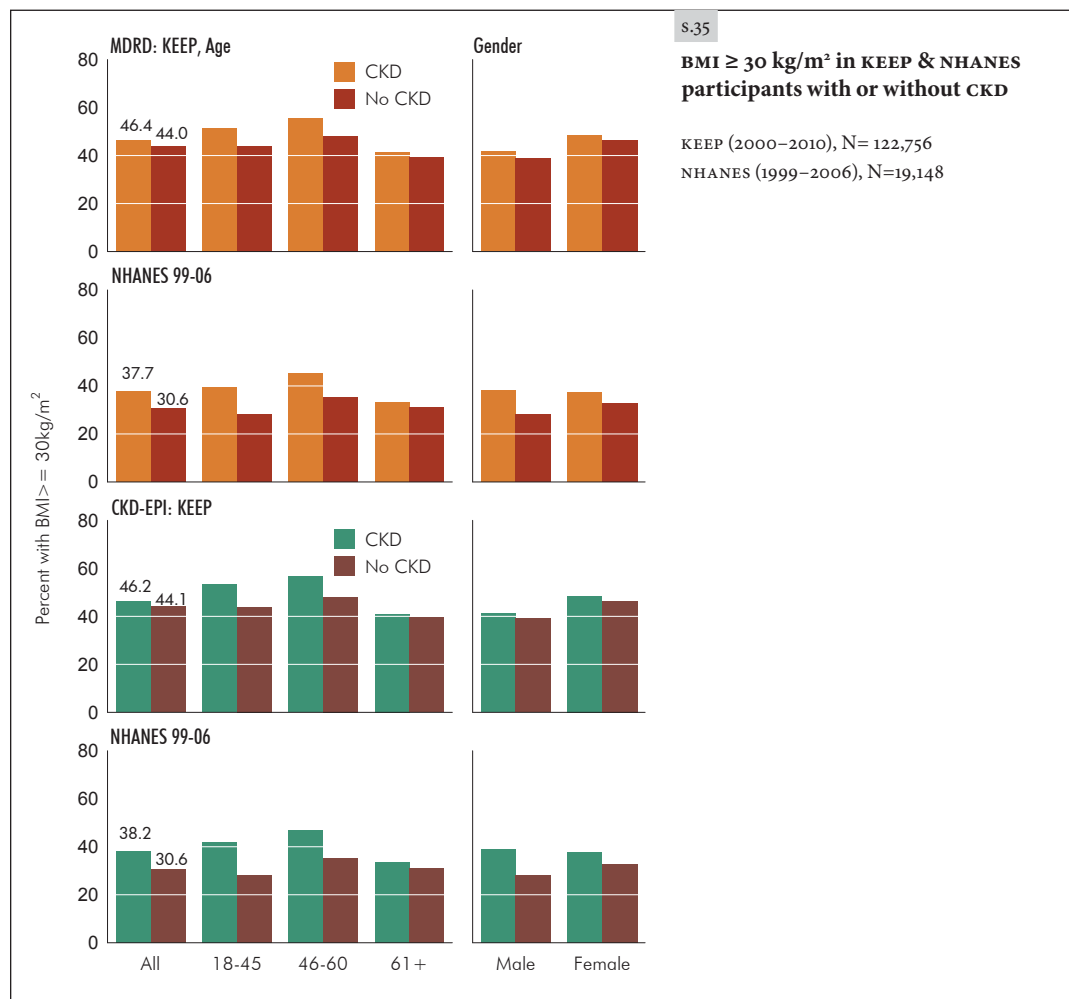
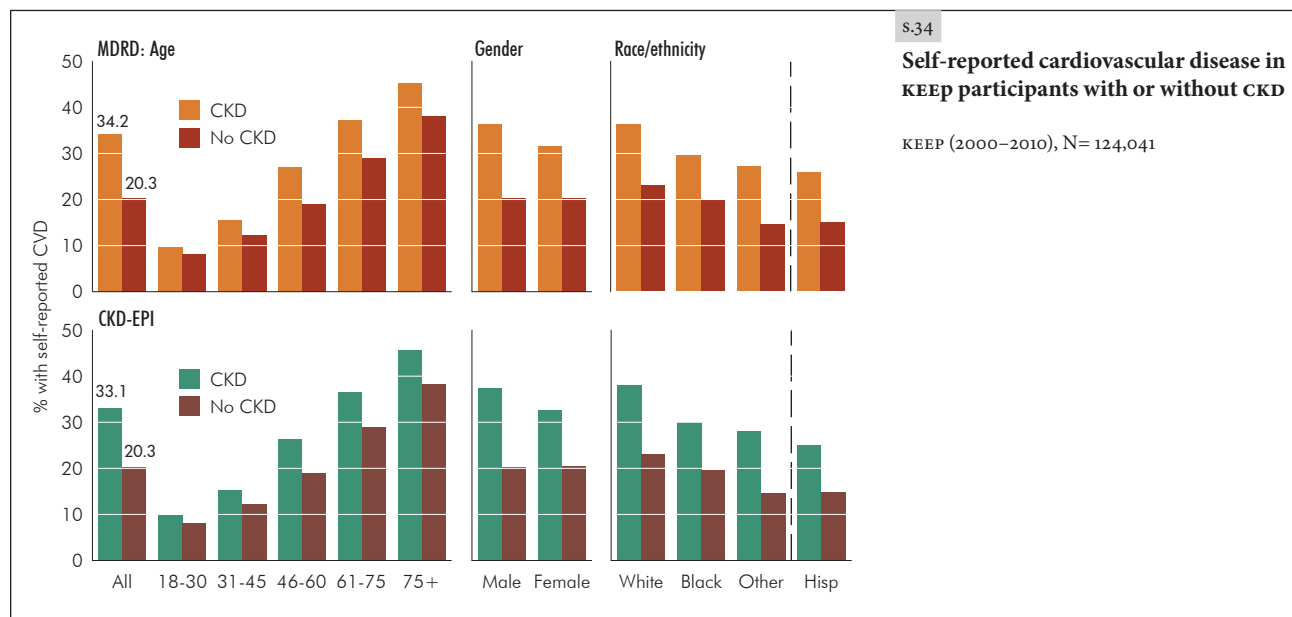
	Non-CKD	Stage 1 & Abnormal ACR	Stage 2 & Abnormal ACR	Stage 3	Stages 4-5	Missing	All
Age							
18-30	7,542	578	92	69	15	1,439	9,735
31-45	20,958	1,414	575	486	66	3,676	27,175
46-60	36,085	1,843	1,807	3,173	213	5,164	48,285
61-75	24,873	740	2,170	8,262	476	3,368	39,889
>75	5,239	43	854	5,984	543	858	13,521
Gender							
Male	30,083	1,305	1,968	5,668	508	4,669	44,201
Female	64,614	3,313	3,530	12,306	805	9,760	94,328
Missing	.	.	.	.	.	76	76
Race							
White	45,515	1,515	2,664	11,544	754	4,907	66,899
Black	30,859	1,947	1,827	4,426	349	5,570	44,978
Native American	2,884	284	221	459	60	558	4,466
Asian	5,437	256	290	612	62	510	7,167
Pacific Islander	446	42	50	79	12	86	715
Other	8,635	522	394	791	73	942	11,357
Unknown/missing	921	52	52	63	3	1,932	3,023
Ethnicity							
Hispanic	12,433	767	547	1,039	90	2,600	17,476
Non-Hispanic	82,264	3,851	4,951	16,935	1,223	11,905	121,129
U.S. Census Region							
Northeast	22,719	1,067	1,375	4,338	298	3,131	32,928
Midwest	14,056	692	826	2,919	207	2,000	20,700
South	43,900	2,206	2,487	7,768	569	7,573	64,503
West	14,001	653	810	2,943	239	1,790	20,436
Missing	21	.	.	6	.	11	38
U.S. Census Division							
New England	7,414	314	442	1,525	93	1,709	11,497
Middle Atlantic	15,305	753	933	2,813	205	1,422	21,431
East North Central	8,848	470	539	1,668	119	1,010	12,654
West North Central	5,208	222	287	1,251	88	990	8,046
South Atlantic	22,574	1,130	1,261	4,090	276	4,365	33,696
East South Central	11,702	530	674	2,178	148	1,385	16,617
West South Central	9,624	546	552	1,500	145	1,823	14,190
Mountain	8,047	337	446	2,009	133	934	11,906
Pacific	5,954	316	364	934	106	856	8,530
Missing	21	.	.	6	.	11	38
Smoking							
Yes	35,415	1,906	2,365	7,425	589	5,680	53,380
No	56,369	2,556	2,960	9,968	683	7,960	80,496
Missing	2,913	156	173	581	41	865	4,729
Education Level							
<12 years	12,481	774	991	3,260	310	2,477	20,293
12 years	23,649	1,211	1,565	5,416	416	3,653	35,910
>12 years	24,379	1,228	1,319	4,206	293	3,716	35,141
16 years	20,883	942	948	2,746	163	2,717	28,399
>16 years	12,187	401	584	2,102	114	1,563	16,951
Missing	1,117	62	91	244	17	379	1,910
Health Insurance Status							
Yes	71,769	3,057	4,327	15,612	1,114	10,996	106,875
No	19,899	1,396	970	1,571	140	2,806	26,782
Missing	3,021	165	201	791	59	703	4,940
Doctor Status							
Yes	81,569	3,849	4,966	17,046	1,233	12,073	120,736
No	11,428	683	418	633	53	1,950	15,165
Missing	1,700	86	114	295	27	482	2,704
All	94,697	4,618	5,498	17,974	1,313	14,505	138,605

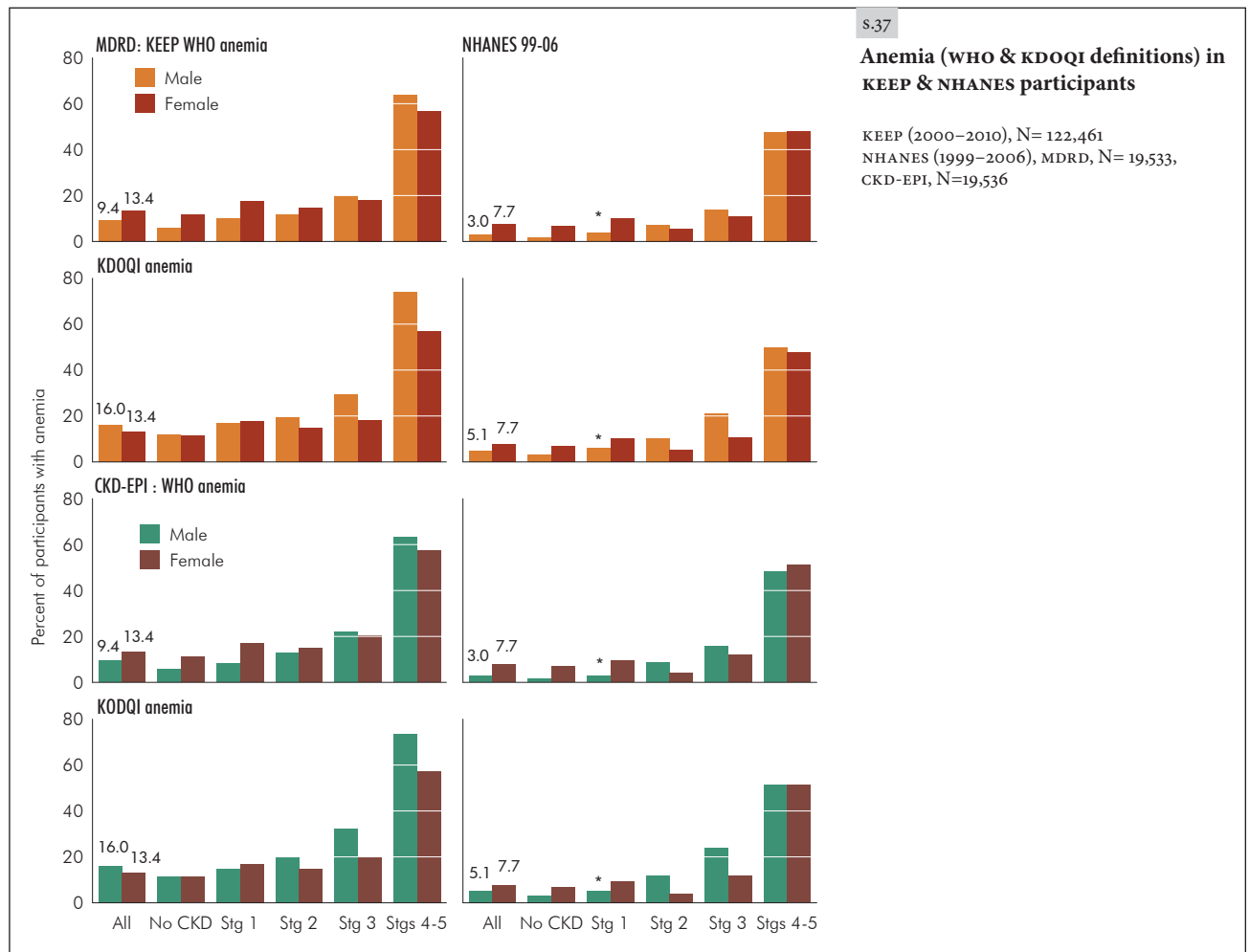
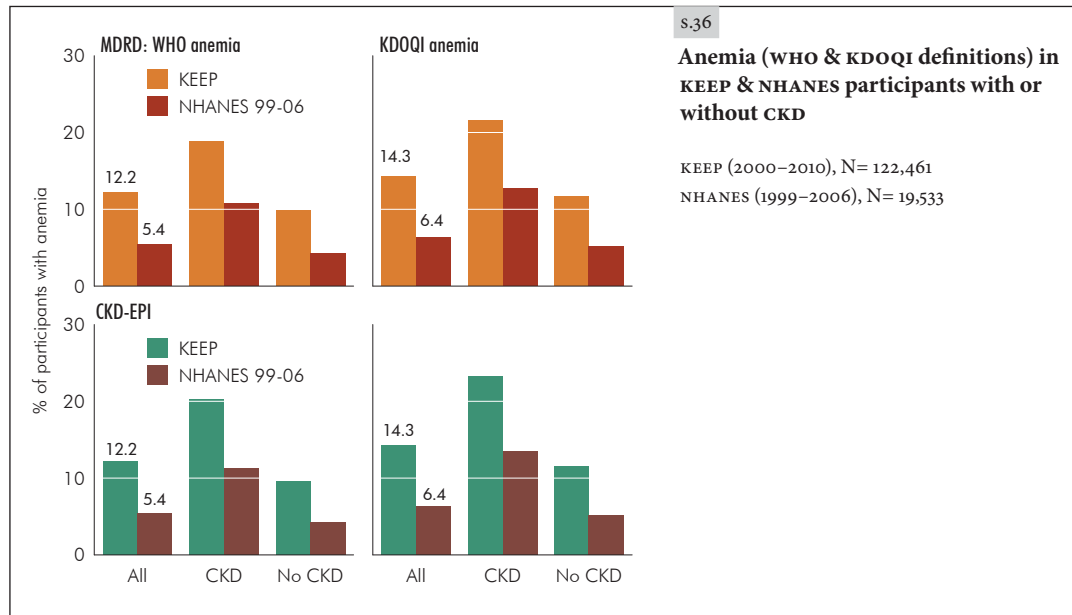
"." Zero values in this cell









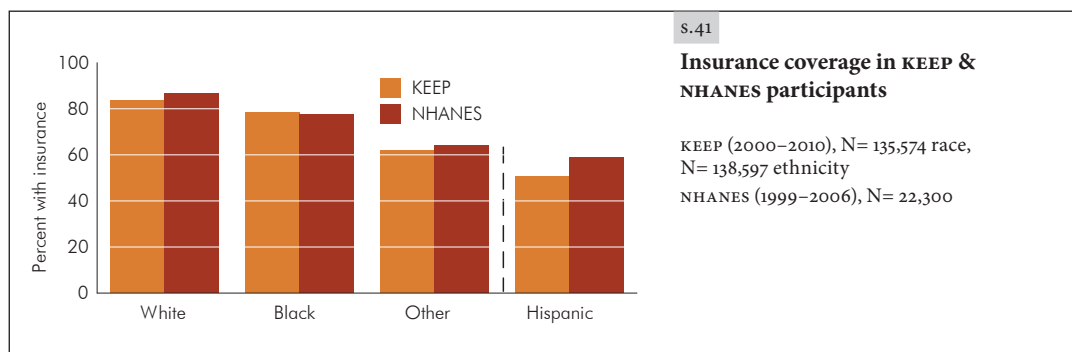
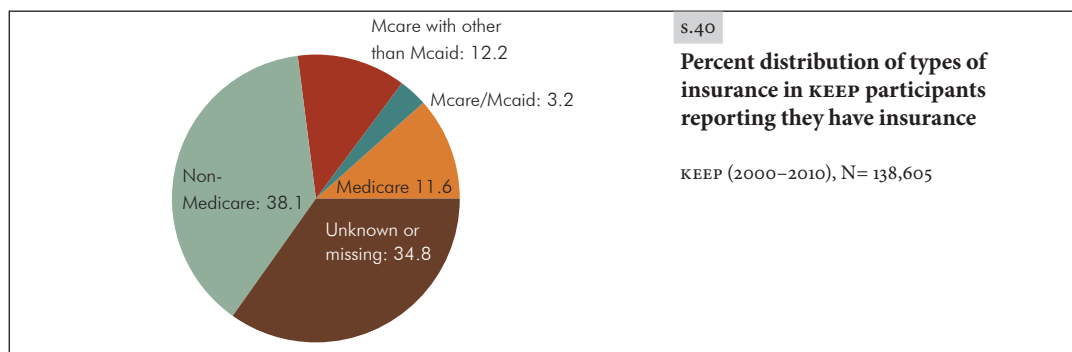
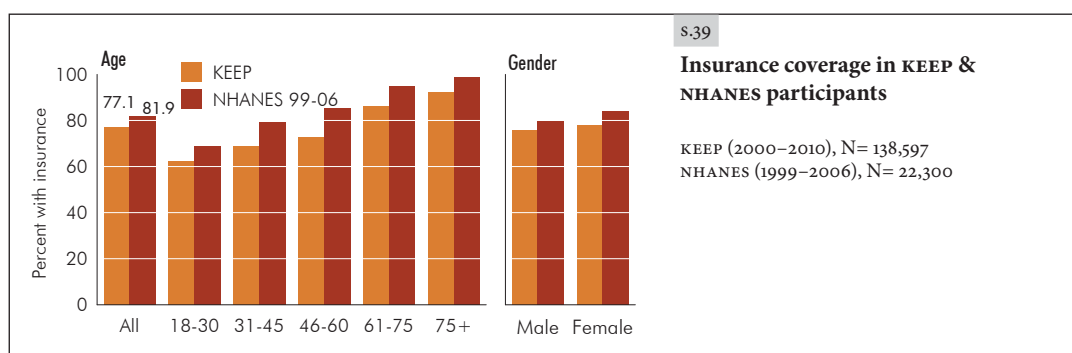
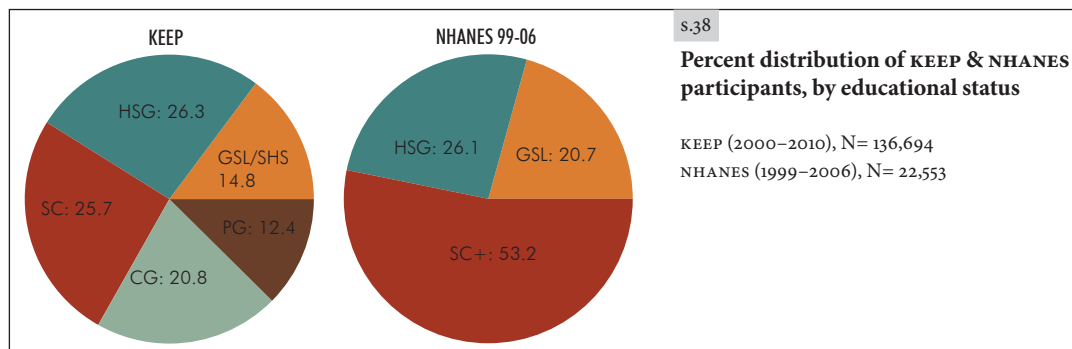


s.d

Odds ratio (OR) of CKD, by risk factor

KEEP (2000–2010), N= 62,715

MDRD equation	OR	Low	Upper	P-value
Age				
18 - 45	0.74	0.69	0.79	<.0001
46 - 60	1.00			
61 - 75	1.84	1.75	1.93	<.0001
75+	4.33	4.06	4.62	<.0001
Male	0.93	0.90	0.97	0.00
Race				
White	1.00			
Black	0.64	0.61	0.67	<.0001
Native American	1.07	0.92	1.24	0.37
Asian	0.66	0.59	0.72	<.0001
Other	1.17	1.06	1.29	0.00
Hispanic	0.65	0.59	0.71	<.0001
Self-reported diabetes	1.42	1.36	1.48	<.0001
Self-reported hypertension	1.76	1.68	1.84	<.0001
Self-reported high cholesterol	1.11	1.06	1.15	<.0001
Cardiovascular disease	1.25	1.19	1.30	<.0001
BMI ≥ 30 kg/m ²	1.14	1.10	1.19	<.0001
Anemia (WHO definition)	2.09	1.98	2.21	<.0001
Insurance	0.95	0.90	1.00	0.05
CKD-EPI equation	OR	Low	Upper	P-value
Age				
18 - 45	0.83	0.78	0.89	<.0001
46 - 60	1.00			
61 - 75	2.07	1.96	2.18	<.0001
75+	6.29	5.88	6.72	<.0001
Male	1.04	0.99	1.08	0.13
Race				
White	1.00			
Black	0.79	0.75	0.83	<.0001
Native American	1.19	1.02	1.38	0.03
Asian	0.71	0.64	0.79	<.0001
Other	1.18	1.07	1.31	0.00
Hispanic	0.70	0.64	0.77	<.0001
Self-reported diabetes	1.48	1.42	1.55	<.0001
Self-reported hypertension	1.79	1.71	1.88	<.0001
Self-reported high cholesterol	1.09	1.05	1.14	<.0001
Cardiovascular disease	1.27	1.22	1.33	<.0001
BMI ≥ 30 kg/m ²	1.15	1.10	1.20	<.0001
Anemia (WHO definition)	2.22	2.10	2.35	<.0001
Insurance	0.93	0.88	0.98	0.01



s.e				
Hazard ratio of RRT, controlled by risk factors				
KEEP (2000–2010), N= 110,423				
	Estimate	SE	P-value	Hazard ratio
Age				
18 - 45	0.31	0.14	0.0303	1.36
46 - 60	1.00			
61 - 75	-0.60	0.11	<.0001	0.55
75+	-1.08	0.15	<.0001	0.34
Male	0.64	0.09	<.0001	1.89
Race				
White	1.00			
Black	0.47	0.11	<.0001	1.60
Native American	0.53	0.18	0.0039	1.70
Asian	0.30	0.20	0.1450	1.35
Other	0.07	0.21	0.7366	1.07
Hispanic	-0.27	0.21	0.1943	0.76
Self-reported diabetes	0.48	0.10	<.0001	1.62
Self-reported hypertension	0.48	0.16	0.0019	1.62
Cardiovascular disease	0.14	0.09	0.1509	1.15
BMI ≥ 30 kg/m ²	0.02	0.10	0.8254	1.02
Anemia (WHO definition)	0.92	0.10	<.0001	2.50
Insurance	-0.07	0.13	0.5629	0.93
eGFR(continuous)	-0.09	0.00	<.0001	0.92
ACR ≥ 30 mg/g	2.26	0.13	<.0001	9.60

s.f				
Hazard ratio of death, controlled by risk factors				
KEEP (2000–2010), N= 101,417				
MDRD Study Equation	Estimate	SE	P-value	Hazard ratio
Age				
18 - 45	-0.96	0.09	<.0001	0.38
46 - 60	1.00			
61 - 75	0.90	0.05	<.0001	2.45
75+	1.83	0.06	<.0001	6.25
Male	0.56	0.03	<.0001	1.75
Race				
White	1.00			
Black	-0.07	0.04	0.08	0.93
Native American	0.37	0.07	<.0001	1.44
Asian	-0.37	0.09	<.0001	0.69
Other	-0.31	0.11	0.01	0.74
Hispanic	-0.24	0.09	0.01	0.79
Self-reported diabetes	0.34	0.04	<.0001	1.41
Self-reported hypertension	0.16	0.04	0.00	1.17
Cardiovascular disease	0.51	0.04	<.0001	1.66
BMI ≥ 30 kg/m ²	-0.06	0.04	0.09	0.94
Anemia (WHO definition)	0.57	0.04	<.0001	1.77
Insurance	-0.18	0.06	0.00	0.84
CKD by MDRD				
non-CKD	1.00			
stage 1	0.76	0.10	<.0001	2.14
stage 2	0.67	0.06	<.0001	1.95
stage 3-5	0.59	0.04	<.0001	1.81
CKD-EPI Equation	Estimate	SE	P-value	Hazard ratio
Age				
18 - 45	-0.96	0.09	<.0001	0.38
46 - 60	1.00			
61 - 75	0.88	0.05	<.0001	2.41
75+	1.77	0.06	<.0001	5.87
Male	0.55	0.03	<.0001	1.73
Race				
White	1.00			
Black	-0.10	0.04	0.02	0.91
Native American	0.36	0.07	<.0001	1.44
Asian	-0.38	0.09	<.0001	0.69
Other	-0.31	0.11	0.01	0.73
Hispanic	-0.24	0.09	0.01	0.79
Self-reported diabetes	0.34	0.04	<.0001	1.41
Self-reported hypertension	0.15	0.04	0.00	1.17
Cardiovascular disease	0.51	0.04	<.0001	1.66
BMI ≥ 30 kg/m ²	0	0	0	0.94
Anemia (WHO definition)	0.6	0.0	<.0001	1.74
Insurance	-0.18	0.06	0.00	0.83
CKD by CKD-EPI				
non-CKD	1.00			
stage 1	0.75	0.09	<.0001	2.13
stage 2	0.70	0.06	<.0001	2.01
stage 3-5	0.64	0.04	<.0001	1.90

