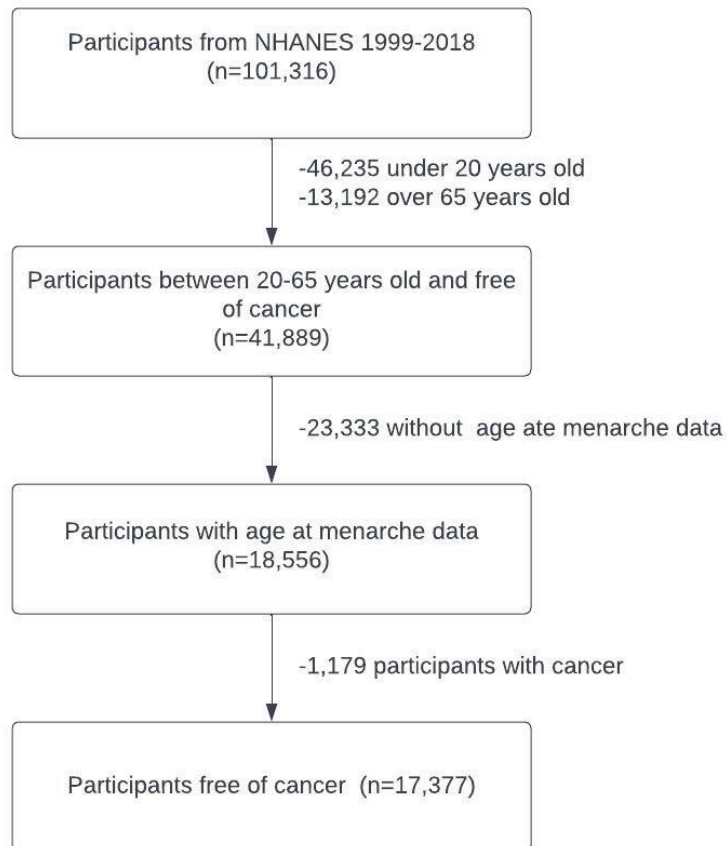


## Appendix



**Figure 1:** Flowchart of participant inclusion

### Stratification by Race/Ethnicity

**Table 1a:** Weighted OR and 95% CI of diabetes according to age at menarche in NHANES 1999-2018 (cancer patients excluded) under 65 years old in White participants

	Cases /Total n	≤10	11	12	13	14	≥15	P trend (linear)	P trend (nonlinear)
<b>Type 2 Diabetes</b>									
Cases/total n		55/495	64/891	135/1822	105/1822	44/922	49/818		
Model 1	452/6770	2.05(1.43-2.94)	1.30(0.88-1.89)	1.47(1.06-1.89)	1	0.87(0.58-1.32)	0.98(0.61-1.58)	0.00016	0.003
Model 2	452/6770	1.92(1.33-2.76)	1.32(0.89-1.94)	1.46(1.05-2.04)	1	0.95(0.62-1.45)	0.99(0.61-1.62)	0.0053	<.0096
Model 3	452/6770	1.81(1.25-2.65)	1.35(0.92-1.99)	1.43(1.03-1.99)	1	0.92(0.61-1.41)	0.97(0.60-1.58)	0.005	<.0086
Model 4	452/6770	1.41(0.96-2.06)	1.06(0.71-1.56)	1.33(0.96-1.84)	1	0.96(0.63-1.47)	1.18(0.74-1.87)	0.37	0.42

**Table 1b:** Weighted OR and 95% CI of diabetes according to age at menarche in NHANES 1999-2018 (cancer patients excluded) under 65 years old in Hispanic participants

	Cases /Total n	≤10	11	12	13	14	≥15	P trend (linear)	P trend (nonlinear)
<b>Type 2 Diabetes</b>									
Cases/total n		68/476	96/745	150/1311	112/1077	86/710	84/693		
Model 1	596/5012	1.42(0.95-2.13)	1.16(0.72-1.87)	1.03(0.74-1.42)	1	1.04(0.71-1.52)	0.91(0.62-1.33)	0.06	0.07
Model 2	596/5012	1.27(0.85-1.90)	1.10(0.68-1.79)	1.00(0.71-1.41)	1	0.94(0.64-1.45)	0.92(0.62-1.35)	0.15	0.18
Model 3	596/5012	1.29(0.87-1.92)	1.12(0.68-1.83)	1.02(0.72-1.44)	1	0.93(0.63-1.38)	0.90(0.62-1.32)	0.09	0.11
Model 4	596/5012	1.00(0.65-1.52)	1.01(0.60-1.70)	0.91(0.64-1.30)	1	0.93(0.63-1.39)	0.93(0.63-1.39)	0.84	0.87

**Table 1c:** Weighted OR and 95% CI of diabetes according to age at menarche in NHANES 1999-2018 (cancer patients excluded) under 65 years old in Black participants

	Cases/ Total n	≤10	11	12	13	14	≥15	P trend (linear )	P trend (nonlin ear)
<b>Type 2 Diabete s</b>									
Cases/ total n		76/476	85/516	152/1018	111/855	56/452	79/600		
Model 1	559/3 917	1.50(1.07- 2.11)	1.63(1.10 -2.43)	1.24(0.89 -1.74)	1	0.84(0.56 -1.24)	0.94(0.70 -1.28)	0.003	0.004
Model 2	559/3 917	1.48(1.06- 2.07)	1.57(1.04 -2.36)	1.27(0.90 -1.79)	1	0.83(0.56 -1.24)	0.99(0.71 -1.36)	0.009	0.01
Model 3	559/3 917	1.53(1.10- 2.12)	1.59(1.06 -2.38)	1.27(0.90 -1.80)	1	0.85(0.57 -1.27)	0.99 (0.72- 1.38)	0.007	0.01
Model 4	559/3 917	1.39(0.99- 1.95)	1.46(0.98 -2.18)	1.23(0.86 -1.75)	1	0.87(0.58 -1.31)	1.04(0.74 -1.47)	0.04	0.07

**Table 2a:** Weighted OR and 95% CI of cardiovascular disease according to age at menarche in NHANES 1999-2018 among Diabetes Patients under 65 years old in White participants

	Case/ Total n	≤10	11	12	13	14	15	P trend (linear)	P trend (nonlin ear)
Total CVD									
Cases/ total n		11/55	11/64	14/135	11/105	5/44	5/49		
Model 1	57/ 452	1.86(0.85 -4.07)	1.07(0.46 -2.51)	0.57(0.23 -1.46)	1	0.92(0.3 2-2.58)	0.69(0.23 -2.07)	0.11	0.33
Model 2	57/ 452	1.70(0.81 -3.54)	0.88(0.40 -1.98)	0.49(0.18 -1.32)	1	0.84(0.3 1-2.30)	0.67(0.23 -1.95)	0.10	0.48
Model 3	57/ 452	1.70(0.84 -3.43)	0.92(0.45 -1.90)	0.81(0.31 -1.34)	1	0.81(0.3 1-2.09)	0.70(0.24 -1.99)	0.18	0.38
Model 4	57/ 452	1.65(0.82 -3.31)	0.80(0.38 -1.71)	0.51(0.21 -1.27)	1	0.79(0.3 0-2.13)	0.62(0.27 -1.42)	0.16	0.30
CHD									
Cases/tot al n		2/55	5/64	10/134	5/105	4/44	4/49		
Model 1	30/ 451	0.97(0.31 -2.98)	1.31(0.38 -4.47)	1.07(0.40 -2.89)	1	1.86(0.5 9-5.95)	0.20(0.20 -3.45)	0.67	0.66
Model 2	30/ 451	0.81(0.27 -2.42)	0.81(0.30 -2.21)	0.85(0.31 -2.34)	1	1.71(0.4 9-5.93)	1.13(0.27 -4.77)	0.29	0.28
Model 3	30/ 451	0.68(0.17 -2.72)	0.83(0.31 -2.22)	0.95(0.31 -2.90)	1	1.82(0.5 8-5.70)	1.20(0.31 -4.59)	0.19	0.19
Model 4	30/ 451	0.61(0.14 -2.22)	0.68(0.24 -2.22)	0.91(0.29 -2.90)	1	1.76(0.5 8-5.70)	1.15(0.37 -4.59)	0.15	0.15

	451	-2.70)	-1.93)	-2.82)		2-5.99)	-3.55)		
Stroke									
Cases/total n		7/54	7/64	5/135	6/105	1/44	1/49		
Model 1	27/451	2.10(0.71-6.23)	1.30(0.48-3.53)	0.45(0.14-1.41)	1	0.36(0.04-3.60)	0.43(0.18-0.99)	0.02	0.03
Model 2	27/451	2.15(0.67-6.84)	1.31(0.45-3.80)	0.43(0.12-1.57)	1	0.36(0.03-4.30)	0.41(0.18-0.96)	<0.001	0.03
Model 3	27/451	2.49(0.80-7.76)	1.62(0.66-3.93)	0.46(0.14-1.50)	1	0.377(0.03-4.22)	0.50(0.19-1.28)	0.01	0.01
Model 4	27/451	2.74(0.91-8.29)	1.46(0.57-3.75)	0.48(0.16-1.45)	1	0.34(0.024-4.85)	0.49(0.20-1.23)	0.008	0.02

**Table 2b:** Weighted OR and 95% CI of cardiovascular disease according to age at menarche in NHANES 1999-2018 among Diabetes Patients under 65 years old BLACK

	Case/Total n	≤10	11	12	13	14	15	P trend (linear)	P trend (nonlinear)
Total CVD									
Cases/total n		15/76	10/85	19/152	16/111	8/56	8/79		
Model 1	76/559	1.263 (0.588, 2.710)	0.877 (0.422, 1.823)	0.580 (0.300, 1.121)	1	1.115 (0.514, 2.419)	0.431 (0.205, 0.906)	0.04	0.03
Model 2	76/559	1.433 (0.649, 3.165)	0.944 (0.444, 2.006)	0.621 (0.317, 1.218)	1	1.186 (0.526, 2.676)	0.479 (0.213, 1.076)	0.03	0.03
Model 3	76/559	1.557 (0.766, 3.163)	0.752 (0.346, 1.632)	0.654 (0.328, 1.302)	1	1.136 (0.492, 2.621)	0.505 (0.237, 1.077)	0.06	0.06
Model 4	76/559	1.490 (0.729, 3.048)	0.725 (0.332, 1.586)	0.614 (0.300, 1.259)	1	1.102 (0.482, 2.523)	0.457 (0.213, 0.984)	0.03	0.04
CHD									
Cases/total n		1/75	3/85	5/151	10/111	1/56	0/79		
Model 1	20/557	0.131 (0.082, 0.210)	0.724 (0.401, 1.308)	0.173 (0.066, 0.458)	1	0.162 (0.020, 1.340)	-	<0.001	0.009
Model 2	20/557	0.157 (0.094, 0.263)	1.002 (0.518, 1.938)	0.226 (0.082, 0.617)	1	0.248 (0.029, 2.108)	-	<0.0001	0.008

Model 3	20/557	0.152 (0.065, 0.359)	0.670 (0.328, 1.369)	0.258 (0.080, 0.838)	1	0.314 (0.036, 2.711)	-	<0.0001	0.07
Model 4	20/557	0.225 (0.091, 0.558)	0.843 (0.339, 2.094)	0.434 (0.155, 1.218)	1	0.211 (0.028, 1.615)	-	<0.0001	0.0016
Stroke									
Cases/total n		10/76	6/85	11/152	5/111	5/56	6/79		
Model 1	43/559	4.06(2.11-7.80)	2.40(1.09-5.27)	1.92(1.01-3.65)	1	4.33(2.1-8.88)	1.69(0.94-3.04)	0.009	0.16
Model 2	43/559	4.32(2.26-8.25)	2.63(1.15-6.02)	1.99(1.01-3.91)	1	4.16(1.9-9.8.69)	1.93(1.06-3.53)	0.0004	0.16
Model 3	43/559	4.87(2.67-8.90)	2.10(0.85-5.24)	2.16(1.04-4.52)	1	4.1(1.80-9.33)	2.10(1.17-3.73)	0.0002	0.18
Model 4	43/559	4.29(2.20-8.39)	2.05(0.84-5.00)	1.72(0.79-3.78)	1	3.99(1.76-9.06)	1.74(0.95-3.20)	0.002	0.26

**Table 2c:** Weighted OR and 95% CI of cardiovascular disease according to age at menarche in NHANES 1999-2018 among Diabetes Patients under 65 years old in Hispanic participants

	Case/Total n	≤10	11	12	13	14	15	P trend (linear)	P trend (nonlinear)
Total CVD									
Cases/total n		6/68	12/96	17/150	4/112	8/86	8/84		
Model 1	55/596	4.406 (1.160, 16.738)	3.745 (1.143, 12.266)	4.573 (1.651, 12.669)	1	3.734 (0.980, 14.228)	3.976 (1.128, 14.020)	0.78	0.84
Model 2	55/596	3.490 (0.819, 14.869)	3.192 (0.957, 10.650)	3.812 (1.356, 10.719)	1	3.372 (0.852, 13.348)	3.649 (1.080, 12.326)	0.95	0.89
Model 3	55/596	3.184 (0.705, 14.382)	3.361 (0.986, 11.453)	4.487 (1.482, 13.582)	1	3.268 (0.889, 12.003)	3.101 (0.924, 10.407)	0.86	0.91
Model 4	55/596	3.201 0.766 13.367	2.982 (0.818, 10.876)	3.695 (1.177, 11.602)	1	3.427 (1.005, 11.683)	2.461 (0.740, 8.190)	0.77	0.82
CHD									
		3/68	4/95	5/150	1/111	3/86	2/84		

Cases/total n									
Model 1	18/594	2.202 (0.654, 7.409)	3.991 (1.437, 11.086)	3.276 (1.764, 6.086)	1	7.658 (0.988, 59.360)	1.603 (0.328, 7.828)	0.87	0.88
Model 2	18/594	2.102 (0.642, 6.889)	5.715 (1.391, 23.487)	3.912 (1.459, 10.486)	1	7.811 (1.647, 37.051)	1.769 (0.275, 11.377)	0.96	0.68
Model 3	18/594	1.638 (0.450, 5.960)	4.434 (1.083, 18.150)	4.515 (1.781, 11.444)	1	5.175 (1.986, 13.488)	1.503 (0.290, 7.800)	0.97	0.95
Model 4	18/594	1.592 (0.427, 5.928)	3.485 (0.948, 12.812)	4.330 (1.715, 10.935)	1	4.882 (2.162, 11.025)	1.069 (0.150, 7.594)	0.87	0.85
Stroke									
Cases/total n		3/68	5/95	11/150	2/112	4/86	5/84		
Model 1	30/595	1.098 (0.293, 4.107)	2.234 (0.609, 8.197)	6.550 (1.928, 22.249)	1	2.304 (0.487, 10.890)	4.296 (0.807, 22.865)	0.007	0.16
Model 2	30/595	0.886 (0.236, 3.323)	1.787 (0.488, 6.542)	5.123 (1.484, 17.683)	1	1.967 (0.393, 9.836)	4.052 (0.784, 20.941)	0.01	0.35
Model 3	30/595	0.732 (0.191, 2.815)	1.883 (0.485, 7.317)	5.259 (1.490, 18.562)	1	1.882 (0.371, 9.555)	4.000 (0.736, 21.726)	0.006	0.30
Model 4	30/595	0.796 (0.172, 3.678)	1.551 (0.366, 6.569)	4.493 (1.244, 16.225)	1	2.026 (0.351, 11.697)	2.786 (0.531, 14.608)	0.08	0.35

### SENSITIVITY ANALYSIS BY MENOPAUSE STATUS

**Table 1d:** Weighted OR and 95% CI of diabetes according to age at menarche in NHANES 1999-2018 (cancer patients excluded) under 65 years old in pre-menopausal

	Cases/Total n	≤10	11	12	13	14	≥15	P trend (linear)	P trend (nonlinear)
<b>Type 2 Diabetes</b>									
Cases/total n		74/930	77/1356	158/2732	104/2404	54/1340	56/1327		
Model 1	523/10089	2.16(1.50-3.12)	1.49(1.00-2.22)	1.32(0.94-1.85)	1	0.98(0.62-1.54)	0.76(0.48-1.21)	<0.001	<0.001

Model 2	523/10089	1.75(1.21-2.54)	1.45(0.96-2.19)	1.30(0.93-1.83)	1	1.00(0.64-1.56)	0.75(0.47-1.21)	0.0003	0.006
Model 3	523/10089	1.77(1.22-2.55)	1.46(0.96-2.21)	1.33(0.94-1.86)	1	1.01(0.65-1.59)	0.75(0.47-1.21)	0.0003	<0.0005
Model 4	523/10089	1.36(0.93-2.00)	1.21(0.79-1.85)	1.06(0.86-1.74)	1	0.83(0.66-1.70)	0.83(0.51-1.37)	0.04	0.05

**Table 1e:** Weighted OR and 95% CI of diabetes according to age at menarche in NHANES 1999-2018 (cancer patients excluded) under 65 years old in pos-menopausal

	Cases /Total n	≤10	11	12	13	14	≥15	P trend (linear)	P trend (nonlinear)
<b>Type 2 Diabetes</b>									
Cases/total n		143/635	182/957	330/1834	256/1767	152/991	187/1102		
Model 1	1250/7286	1.72(1.22-2.42)	1.27(0.92-1.75)	1.41(1.06-1.87)	1	0.93(0.66-1.33)	1.14(0.84-1.57)	0.006	0.01
Model 2	1250/7286	1.58(1.10-2.26)	1.22(0.87-1.71)	1.40(1.05-1.88)	1	0.92(0.65-1.31)	1.03(0.74-1.43)	0.005	0.007
Model 3	1250/7286	1.56(1.09-2.23)	1.27(0.90-1.79)	1.41(1.05-1.90)	1	0.93(0.65-1.33)	1.02(0.73-1.42)	0.004	0.006
Model 4	1250/7286	1.30(0.90-1.86)	1.10(0.78-1.56)	1.33(0.99-1.78)	1	0.95(0.67-1.37)	1.17(0.85-1.60)	0.31	0.35