

Supplementary Table 1. Cohort summary				
	ARIC	MESA	JHS ^a	FHS-Offspring
Original baseline exam	1987-1989	2000-2002	2000-2002	1971 - 1975
Original baseline age	45-64	45-84	21-84	5 - 70
Original sample size	15,792	6,814	5,302	4,095
Baseline exam in the current study	1990-1992 (Exam 2)	2002-2004 (Exam 2)	2000-2002 (Exam 1)	1998-2001 (Exam 7)
Median/maximal follow-up years in the current study	24.3/26.9 years	12.6/13.8 years	14.0/17.4 years	11.8/13.3 years
Race/ethnicity	White Black	White Black Hispanic Asian	Black	White
Center locations	MD, NC, MS, MN	MN, IL, MD, NY, NC, CA	Jackson, MS	Framingham, MA
Manual of operation for event criteria and definition	https://sites.csc.unc.edu/aric/surveillance-manuals	https://www.mesa-nhlbi.org/PublicDocs/MesaMOO/MESA%20Clinical%20Events%20MOP%20(6.22.18).pdf	https://www.jacksonheartstudy.org/Research/Study-Design/Forms-Manuals/Events-Surveillance-Forms	https://framinghamheartstudy.org/files/2019/05/MO-Endpoint-Review-v2.0-msp.pdf
<p>a. In the current study, participants from both JHS and ARIC were excluded from the JHS cohort with the ARIC exam used instead as their baseline.</p> <p>Abbreviation: ARIC = Atherosclerosis Risk In Communities; FHS = Framingham Heart Study; JHS = Jackson Heart Study; MESA = Multi-Ethnic Study of Atherosclerosis</p>				

Supplementary Table 2. Hazard ratios for ASCVD events by DM/CVD groups (using DM-/CVD- as reference).			
	Unadjusted HR	Age, sex and race adjusted HRs	Fully adjusted HRs
DM-/CVD-	Ref	Ref	Ref
DM+/CVD-	2.47 (2.28-2.67)	2.26 (2.09-2.45)	1.84 (1.69-2.00)
DM-/CVD+	4.01 (3.71-4.33)	3.00 (2.77-3.26)	2.43 (2.23-2.65)
DM+/CVD+	7.42 (6.76-8.15)	5.12 (4.64-5.65)	3.42 (3.08-3.80)
<p>All HRs had p <0.0001.</p> <p>Fully adjusted HRs were adjusted for age, sex, race, family history of CVD, education, smoking, alcohol use, SBP, BMI, triglycerides, HDL-C, hs-CRP, serum creatinine, lipid lowering medication, hypertension medication, and other two DM/CVD groups.</p> <p>Abbreviation: ASCVD = atherosclerotic cardiovascular disease; BMI = body mass index; CVD = cardiovascular disease; DM = diabetes mellitus; HDL-C = high density lipoprotein cholesterol; HR = hazard ratio; hs-CRP =high sensitivity C-reactive protein; SBP = systolic blood pressure.</p>			

Supplementary Table 3. Hazard ratios for ASCVD events comparing DM severity group vs. DM-/CVD+			
	Unadjusted HR (95%CI)	Age, sex and race adjusted HR (95%CI)	Fully adjusted HR (95%CI) ^a
Overall DM+/CVD- vs. DM-/CVD+	0.62 (0.56-0.68) [‡]	0.75 (0.68-0.83) [‡]	0.76 (0.69-0.84) [†]
DM duration subgroups vs DM-/CVD+			
Newly diagnosed DM	0.45 (0.39-0.52) [‡]	0.57 (0.49-0.66) [‡]	0.57 (0.49-0.67) [‡]
DM duration 1 - <10 years	0.64 (0.57-0.72) [‡]	0.79 (0.70-0.88) [‡]	0.79 (0.70-0.89) [†]
DM duration 10+ years	0.90 (0.77-1.06)	1.01 (0.87-1.19)	1.01 (0.86-1.19)
HbA1c subgroups vs DM-/CVD+			
HbA1c < 7%	0.50 (0.44-0.56) [‡]	0.60 (0.53-0.67) [‡]	0.62 (0.55-0.70) [‡]
HbA1c 7% - < 9%	0.65 (0.56-0.74) [‡]	0.79 (0.68-0.91) [*]	0.77 (0.66-0.89) [†]
HbA1c ≥ 9%	1.01 (0.87-1.18)	1.44 (1.23-1.68) [‡]	1.40 (1.20-1.64) [‡]
DM medication use subgroups vs DM-/CVD+			
Not on DM medication	0.51 (0.46-0.58) [‡]	0.64 (0.57-0.72) [‡]	0.65 (0.58-0.73) [‡]
On DM medication	0.77 (0.69-0.86) [‡]	0.91 (0.81-1.03)	0.91 (0.81-1.03)
<p>a. Fully adjusted HRs were adjusted for age, sex, race, family history of CVD, education, smoking, alcohol use, SBP, BMI, triglycerides, HDL-C, hs-CRP, serum creatinine, lipid lowering medication, hypertension medication, and other two DM/CVD groups.</p> <p>*p<0.01, †p<0.001, ‡p<0.0001</p> <p>Abbreviation: ASCVD = atherosclerotic cardiovascular disease; BMI = body mass index; CVD = cardiovascular disease; DM = diabetes mellitus; HbA1c = Hemoglobin A1c; HDL-C = high density lipoprotein cholesterol; HR = hazard ratio; hs-CRP =high sensitivity C-reactive protein; SBP = systolic blood pressure.</p>			

Supplementary Table 4. ASCVD events hazard ratios of DM+/CVD- vs. DM-/CVD+ in subgroups			
Subgroup		HR (95% CI)	P value for interaction test
Sex	Female	0.91 (0.78-1.05)	0.091
	Male	0.66 (0.58-0.76) [†]	
Race	White	0.72 (0.63-0.82) [†]	0.175
	Black	0.87 (0.73-1.04)	
	Other races	0.72 (0.30-1.71)	
Age groups	Age < 55 years	0.88 (0.70-1.11)	<0.0001
	Age 55 - <65 years	0.64 (0.55-0.75) [†]	
	Age ≥ 65 years	0.66 (0.55-0.78) [†]	
Triglyceride groups	Triglycerides < 2.26 mmol/L	0.70 (0.63-0.79) [†]	0.002
	Triglycerides ≥ 2.26 mmol/L	0.98 (0.78-1.23)	
hs-CRP groups	hs-CRP < 2 mg/L	0.69 (0.58-0.82) [†]	0.035
	hs-CRP ≥ 2 mg/L	0.80 (0.71-0.90) [*]	
Chronic kidney disease	eGFR ≥ 90 mL/min/1.73m ²	0.67 (0.43-1.04)	0.056
	eGFR 60 - <90 mL/min/1.73m ²	0.71 (0.62-0.82) [†]	
	eGFR < 60 mL/min/1.73m ²	0.76 (0.65-0.89) [*]	
HRs were adjusted for age, sex, race, family history of CVD, education, smoking, alcohol use, SBP, BMI, triglycerides, HDL-C, hs-CRP, serum creatinine, lipid lowering medication, hypertension medication, and other two DM/CVD groups.			
*p<0.001, †p<0.0001			
Abbreviation: ASCVD = atherosclerotic cardiovascular disease; BMI = body mass index; CVD = cardiovascular disease; DM = diabetes mellitus; eGFR = estimated glomular filtration rate; HDL-C = high density lipoprotein cholesterol; HR = hazard ratio; hs-CRP =high sensitivity C-reactive protein; SBP = systolic blood pressure.			

Supplementary Table 5. Hazard ratios of DM+/CVD- vs. DM-/CVD+ in subgroups (with non-significant interaction test)

		HR (95% CI)	
		CVD events	ASCVD events
Family history of CVD	No	0.80 (0.71-0.89) [§]	0.74 (0.64-0.86) [‡]
	Yes	0.90 (0.81-1.00) [*]	0.75 (0.66-0.86) [§]
Current smoker	No	0.63 (0.57-0.70) [§]	0.54 (0.48-0.62) [§]
	Yes	0.67 (0.55-0.80) [§]	0.53 (0.42-0.67) [§]
Hypertension	No	0.83 (0.73-0.96) [†]	0.78 (0.65-0.94) [†]
	Yes	0.92 (0.84-1.01)	0.81 (0.72-0.92) [‡]
Obesity	No	0.83 (0.75-0.92) [‡]	0.73 (0.64-0.84) [§]
	Yes	0.92 (0.82-1.04)	0.80 (0.68-0.94) [†]
Low HDL-C	No	0.80 (0.72-0.89) [§]	0.74 (0.64-0.85) [§]
	Yes	0.92 (0.83-1.03)	0.77 (0.67-0.88) [‡]

HRs were adjusted for age, sex, race, family history of CVD, education, smoking, alcohol use, SBP, BMI, triglycerides, HDL-C, hs-CRP, serum creatinine, lipid lowering medication, hypertension medication, and other two DM/CVD groups.

*p<0.05, †p<0.01, ‡p<0.001, §p<0.0001

Abbreviation: ASCVD = atherosclerotic cardiovascular disease; BMI = body mass index; CVD = cardiovascular disease; DM = diabetes mellitus; eGFR = estimated glomerular filtration rate; HDL-C = high density lipoprotein cholesterol; HR = hazard ratio; hs-CRP = high sensitivity C-reactive protein; SBP = systolic blood pressure.

Supplementary Table 6. Individual example on whether one with DM has CVD risk equivalent DM: The example is a 60-year old white male. He has a triglyceride of 2.03 mmol/L, hs-CRP of 2.0mg/L, eGFR of 68 mL/min/1.73m², HbA1c of 8.0% with diabetes medication and a diabetes duration of 3 years.

Parameter	Beta	X	X' ^a	Beta*X	Beta*X'
DM+/CVD- (yes=1, no=0)	0.47158	1	0	0.47158	0
DM+/CVD- (yes=1, no=0)* age (years)	-0.01578	60	0	-0.9468	0
DM+/CVD- (yes=1, no=0) * sex (male=1, female=0)	-0.87053	1	0	-0.87053	0
DM+/CVD- (yes=1, no=0) * age (years)*sex (male=1, female=0)	0.01253	60	0	0.7518	0
DM+/CVD- (yes=1, no=0) * white (white=1, non-white=0)	0.26969	1	0	0.26969	0
DM+/CVD- (yes=1, no=0)* triglycerides (mmol/L)	0.08456	2.03	0	0.17199	0
DM+/CVD- (yes=1, no=0)* ln(hs-CRP) (mg/L)	0.10709	ln(2)	0	0.07423	0
DM+/CVD- (yes=1, no=0)* eGFR (mL/min/1.73m ²)	-0.0076	68	0	-0.5168	0
Hba1c (%) ^b	0.10539	8	6.5	0.84312	0.68504
DM duration 1-10 years (yes=1, no=0)	0.12247	1	0	0.12247	0
DM duration 10+ years (yes=1, no=0)	0.37920	0	0	0	0
DM medication (yes=1, no=0)	0.19084	1	0	0.19084	0
Sum of beta*individual X				0.56159	0.68504
Difference of $\Sigma \text{beta} * X$ and $\Sigma \text{beta} * X'$				-0.12345	
Hazard ratio of CVD events for being DM+/CVD- vs. being DM-/CVD+ ^c				0.88	

$\Sigma \text{beta} * X - \Sigma \text{beta} * X'$ represents the log risk difference of an DM+/CVD- individual vs. had he/she had DM-/CVD+. In the example, the difference is less than 0, indicating that this person, who had DM but no CVD would have lower CVD risk than the counterfactual scenario had he had no DM but CVD; thus his diabetes should not be considered as CVD risk equivalent.

a. X' is the covariate value if the same subject had no DM but prior CVD

b. if one had actual HbA1c (X) $\geq 6.5\%$, corresponding X' for HbA1c is 6.5. if one had actual HbA1c (X) less than 6.5%, corresponding X' for HbA1c is the same as X for HbA1c.

c. $\text{Hazard ratio} = e^{\Sigma \text{beta} * X - \Sigma \text{beta} * X'}$

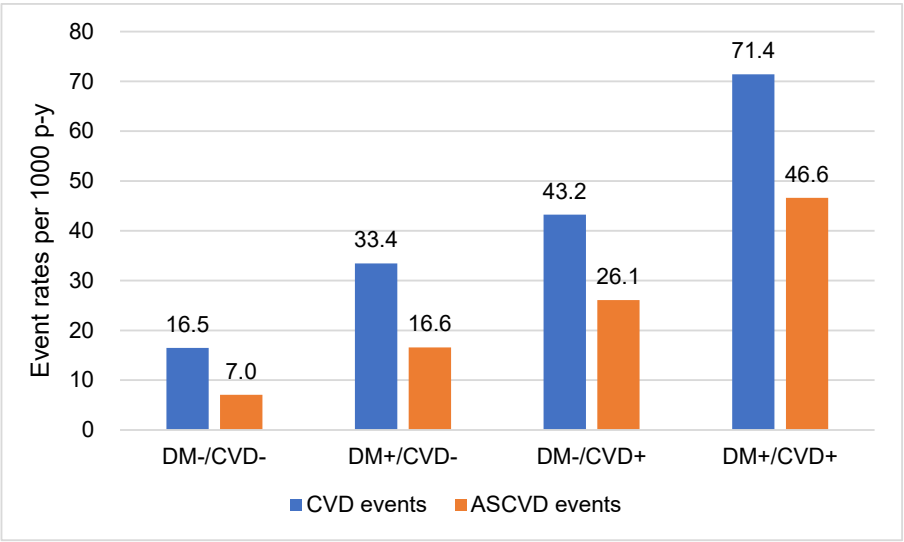
Abbreviation: CVD = cardiovascular disease; DM = diabetes mellitus; eGFR = estimated glomerular filtration rate; HbA1c = Hemoglobin A1c; hs-CRP =high sensitivity C-reactive protein.

Supplementary Table 7. Risk factor comparison by the CVD risk equivalent DM condition in those with DM+/CVD-

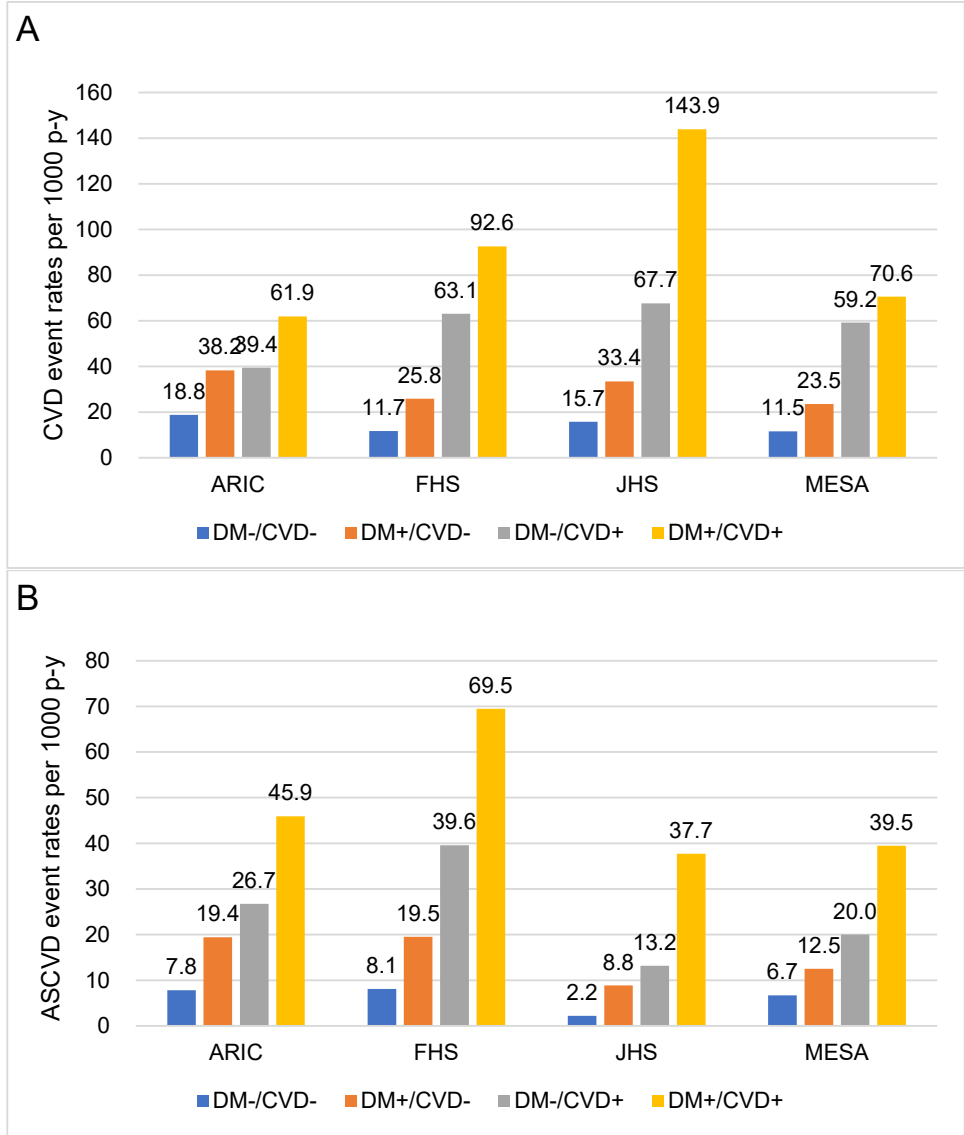
	Non-CVD risk equivalent DM N=3,036	CVD risk equivalent DM N=715	p value
Age, years	60.4 ± 9.3	57.9 ± 7.6	<0.0001
Male sex	1501 (49.4%)	220 (30.8%)	<0.0001
Race			<0.0001
White	1248 (41.1%)	430 (60.1%)	
Black	1380 (45.5%)	261 (36.5%)	
Other races	408 (13.4%)	24 (3.4%)	
Education			0.0002
Less than high school	781 (25.7%)	181 (25.3%)	
High school graduate	772 (25.4%)	237 (33.1%)	
Above high school	721 (23.7%)	136 (19.0%)	
Smoking status			0.005
Never	1266 (41.7%)	335 (46.9%)	
Prior	1305 (43.0%)	260 (36.4%)	
Current	465 (15.3%)	120 (16.8%)	
Alcohol use	1341 (44.2%)	260 (36.4%)	0.0001
Family history of CVD	1276 (42.0%)	367 (51.3%)	<0.0001
SBP, mmHg	129.3 ± 19.5	130.6 ± 21.2	0.155
DBP, mmHg	73.4 ± 10.3	72.0 ± 10.4	0.002
BMI, kg/m ²	31.1 ± 6.3	32.9 ± 7.2	<0.0001
HbA1c, % (mmol/mol)	6.9 ± 1.3 (52.0 ± 14.2)	9.3 ± 2.3 (78.0 ± 25.1)	<0.0001
Fasting glucose, mmol/L	7.8 ± 2.5	12.4 ± 5.3	<0.0001
DM duration, years	4.6±7.3	8.7±8.0	<0.0001
Total cholesterol, mmol/L	5.1 ± 1.0	5.6 ± 1.2	<0.0001
LDL-C, mmol/L	3.2 ± 1.0	3.4 ± 1.1	<0.0001
HDL-C, mmol/L	1.2 ± 0.4	1.1 ± 0.4	<0.0001
Triglycerides, mmol/L	1.6 ± 0.9	2.7 ± 2.4	<0.0001
hs-CRP, mg/L	4.9 ± 7.2	10.0 ± 18.5	<0.0001
Serum creatinine, µmol/L	91.8 ± 25.2	106.9 ± 84.2	<0.0001
eGFR, mL/min/1.73m ²	73.3 ± 18.3	63.6 ± 19.1	<0.0001
PCE risk score, %	21.6 ± 15.4	19.3 ± 14.8	0.0002
PCE risk score ≥ 20%	1382 (45.5%)	269 (37.6%)	0.0001
Left ventricle hypertrophy	116 (3.8%)	36 (5.0%)	0.139
Atrial fibrillation	13 (0.4%)	5 (0.7%)	0.520
Lipid-lowering medication	577 (19.0%)	123 (17.2%)	0.266
Hypertension medication	1720 (56.7%)	426 (59.6%)	0.155
Diabetes medication	1231 (40.5%)	547 (76.5%)	<0.0001
Continuous variables were presented as mean ± SD; categorical variables were presented as frequency (percentage).			

Abbreviation: BMI = body mass index; CVD = cardiovascular disease; DBP = diastolic blood pressure; DM = diabetes mellitus; eGFR = estimated glomerular filtration rate; HbA1c = Hemoglobin A1c; HDL-C = high density lipoprotein cholesterol; hs-CRP = high sensitivity C-reactive protein; LDL-C = low density lipoprotein cholesterol; PCE = Pooled Cohort Equation; SBP = systolic blood pressure.

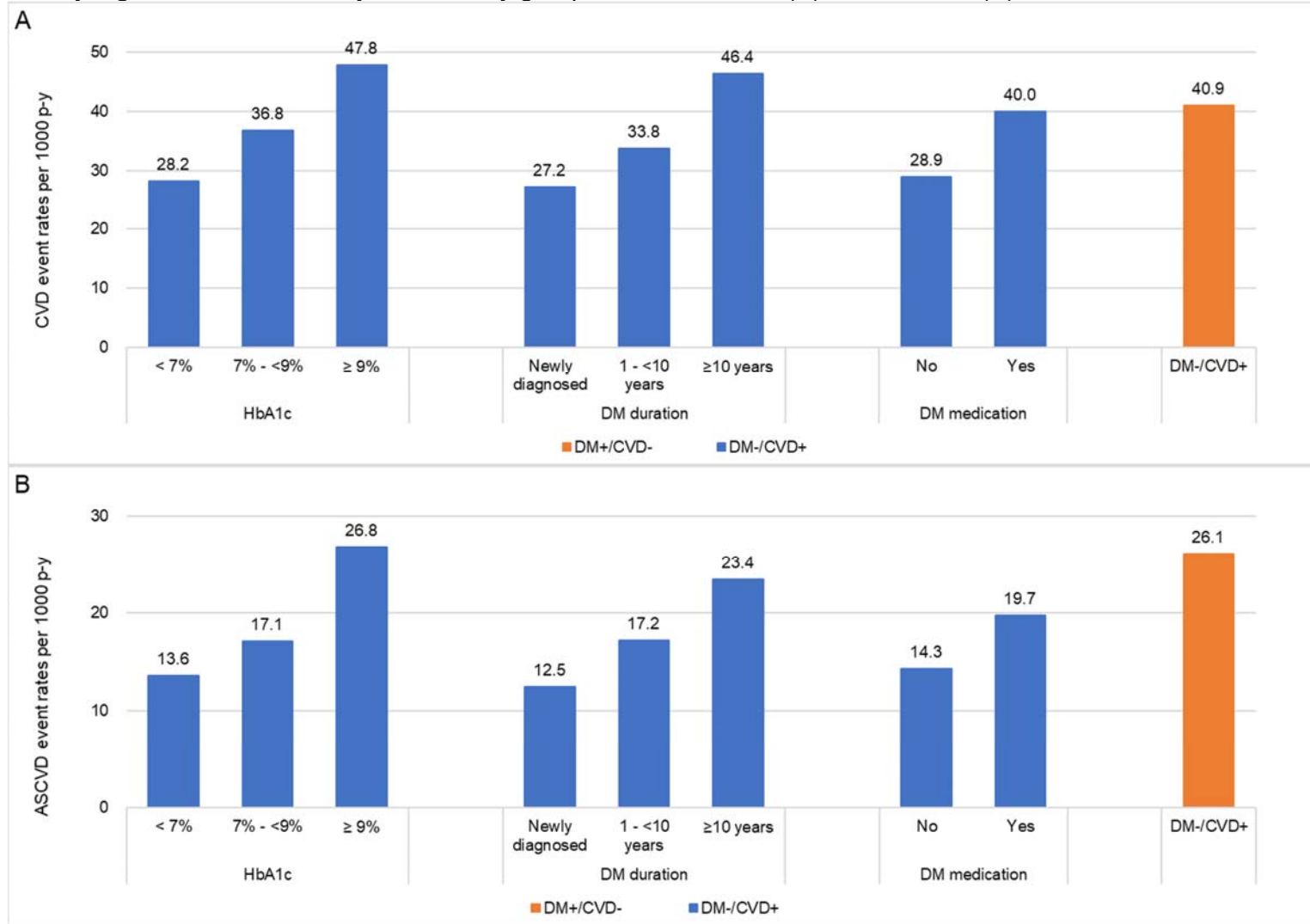
Supplementary Figure 1. CVD/ASCVD event rates by baseline DM/CVD status



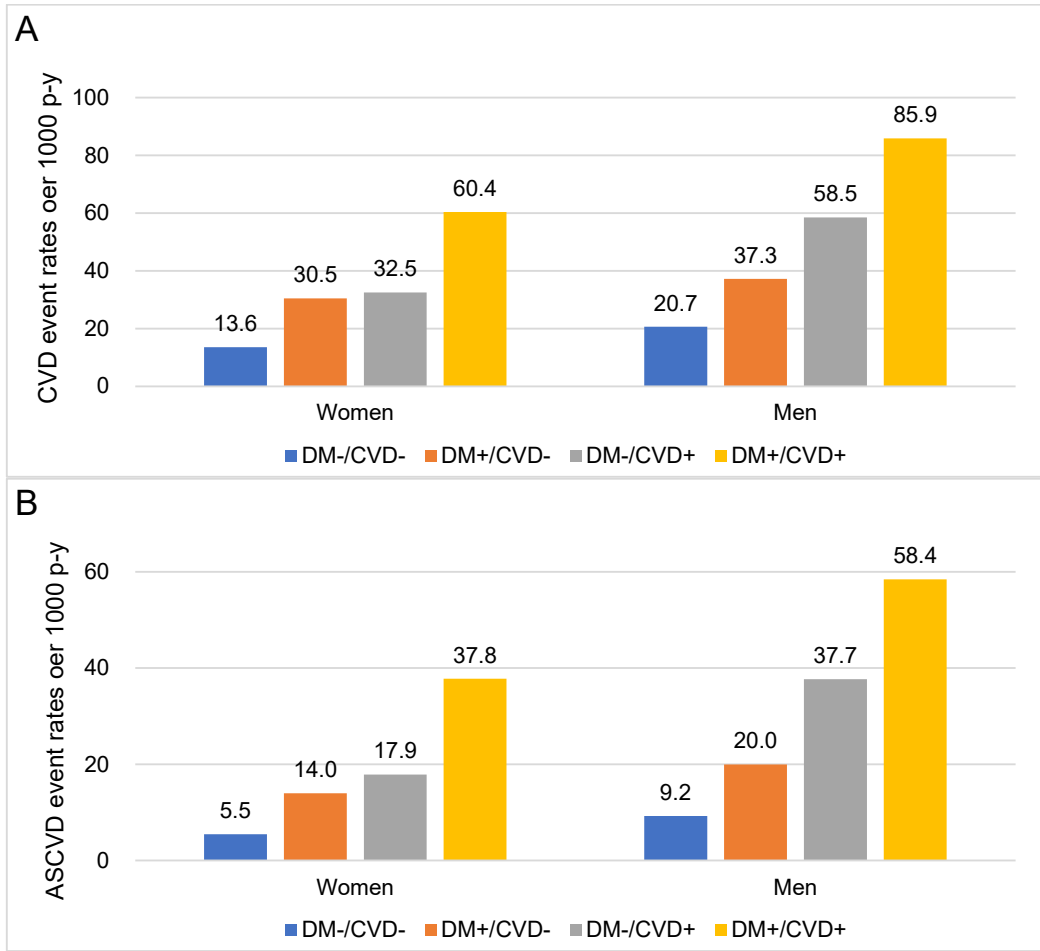
Supplementary Figure 2. Event rates by DM/CVD and cohorts. (A) CVD events;
(B) ASCVD events



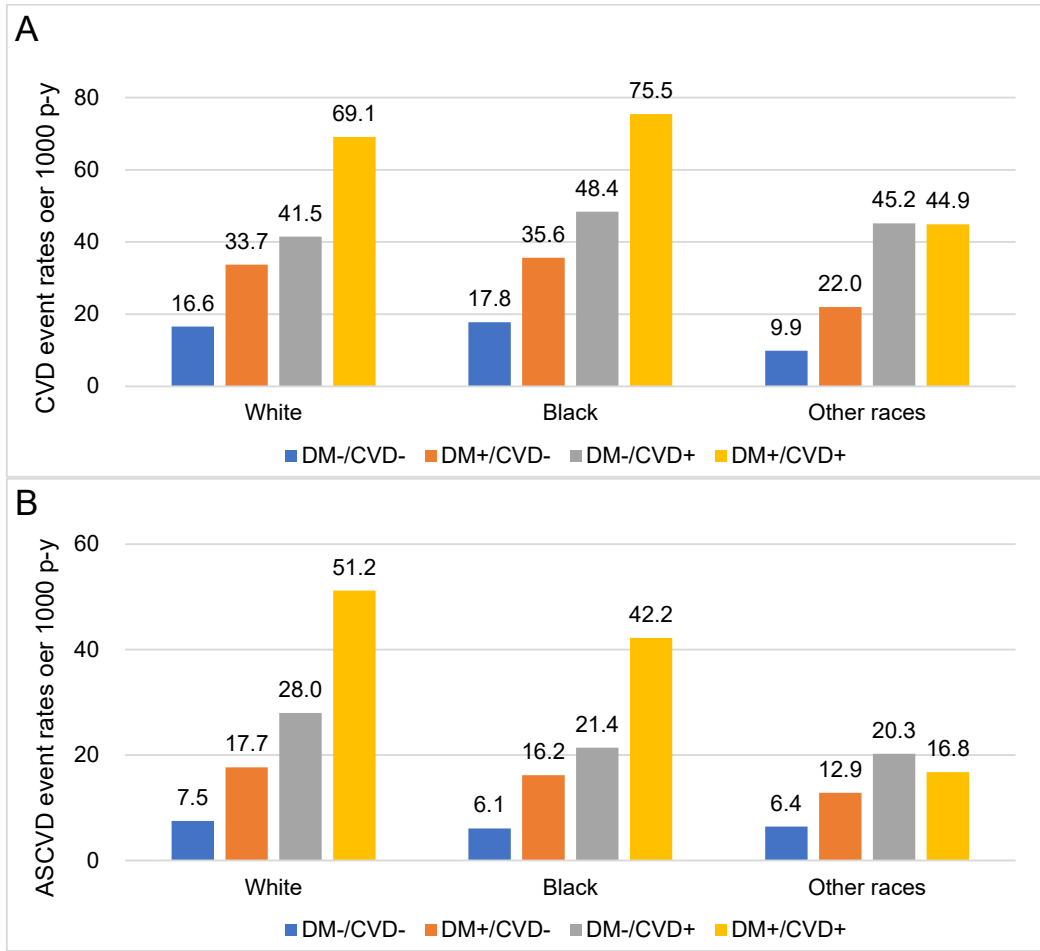
Supplementary Figure 3. Event rates by DM severity groups vs. DM-/CVD+. (A) CVD events; (B) ASCVD events



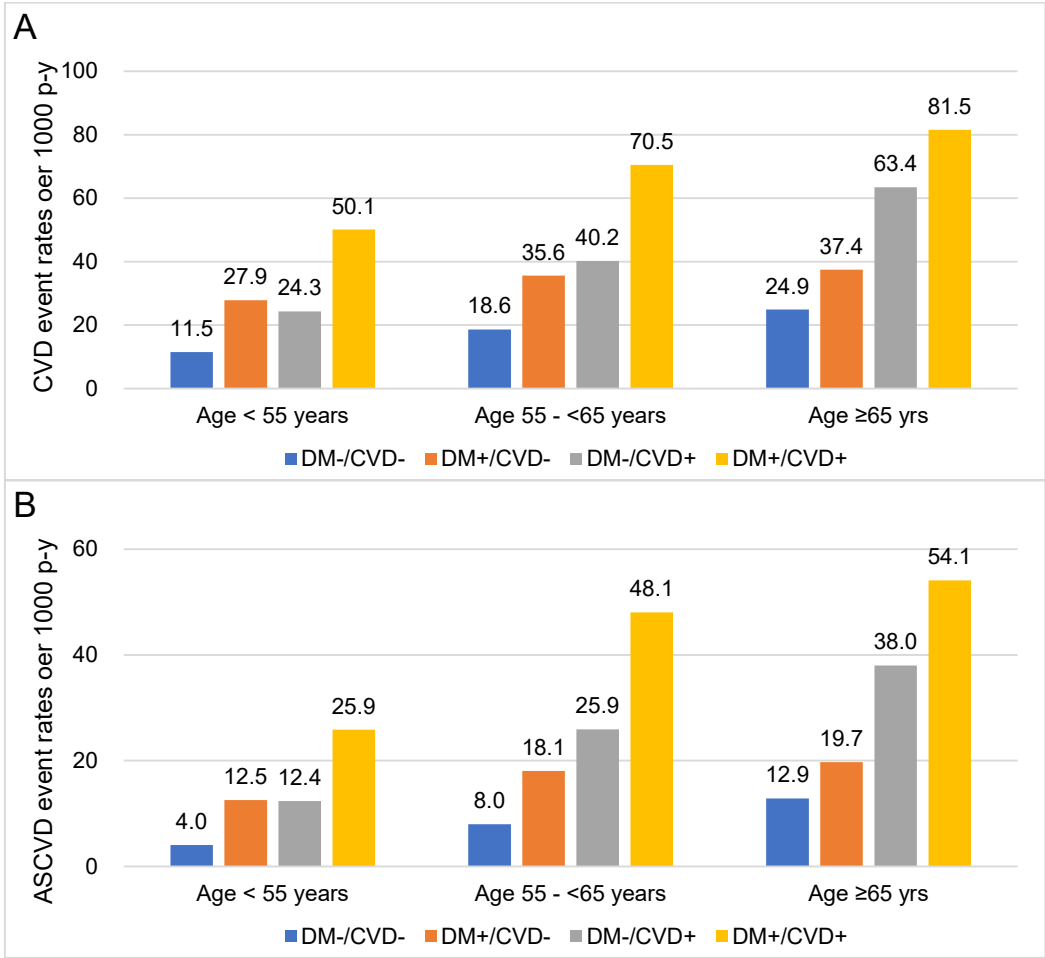
Supplementary Figure 4. Event rates by DM/CVD and sex. (A) CVD events; (B) ASCVD events



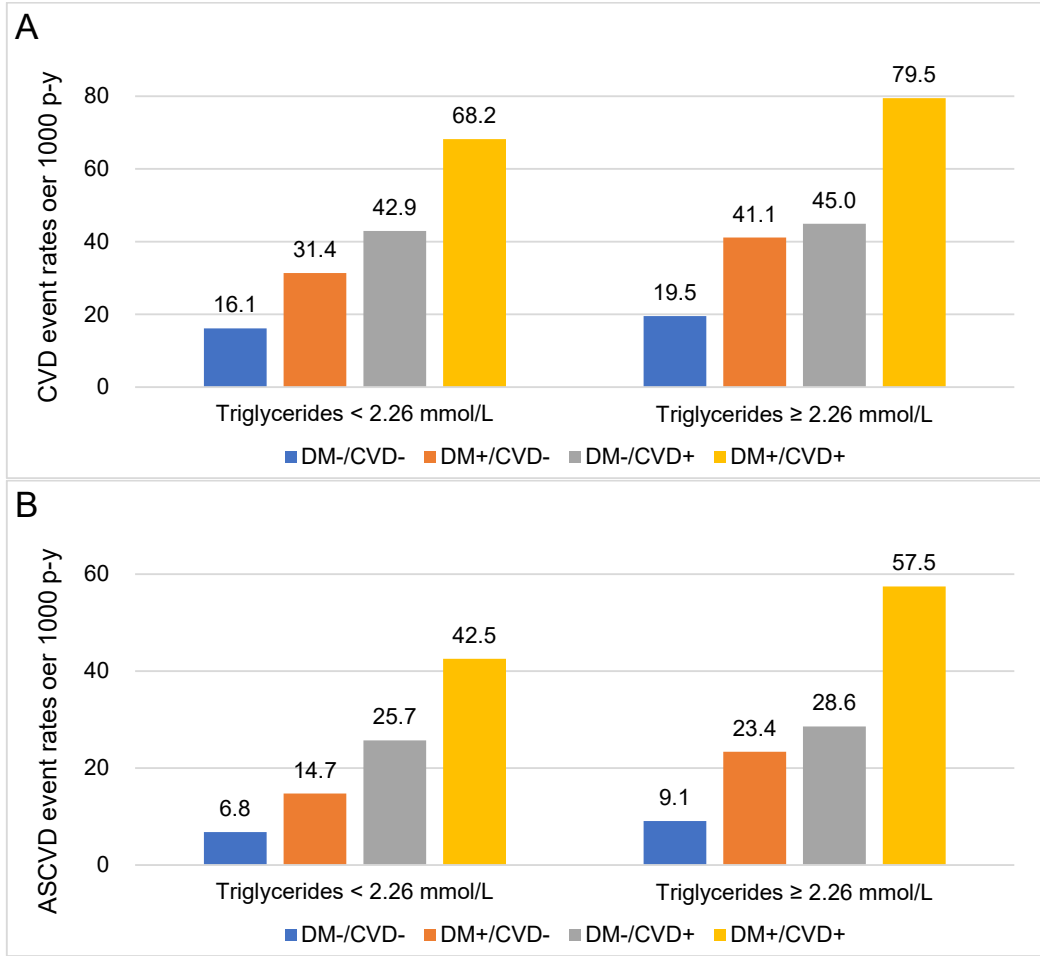
Supplementary Figure 5. Event rates by DM/CVD and race. (A) CVD events; (B) ASCVD events



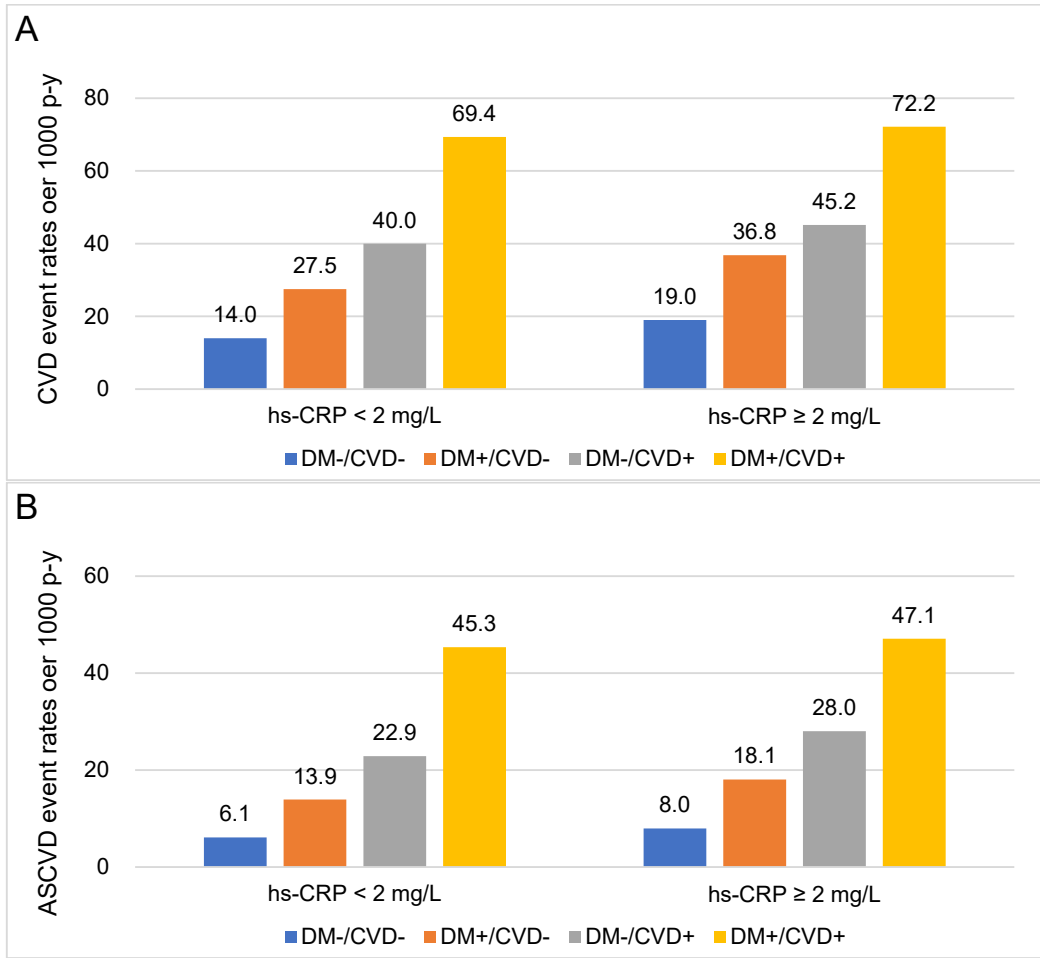
Supplementary Figure 6. Event rates by DM/CVD and age groups. (A) CVD events;
(B) ASCVD events



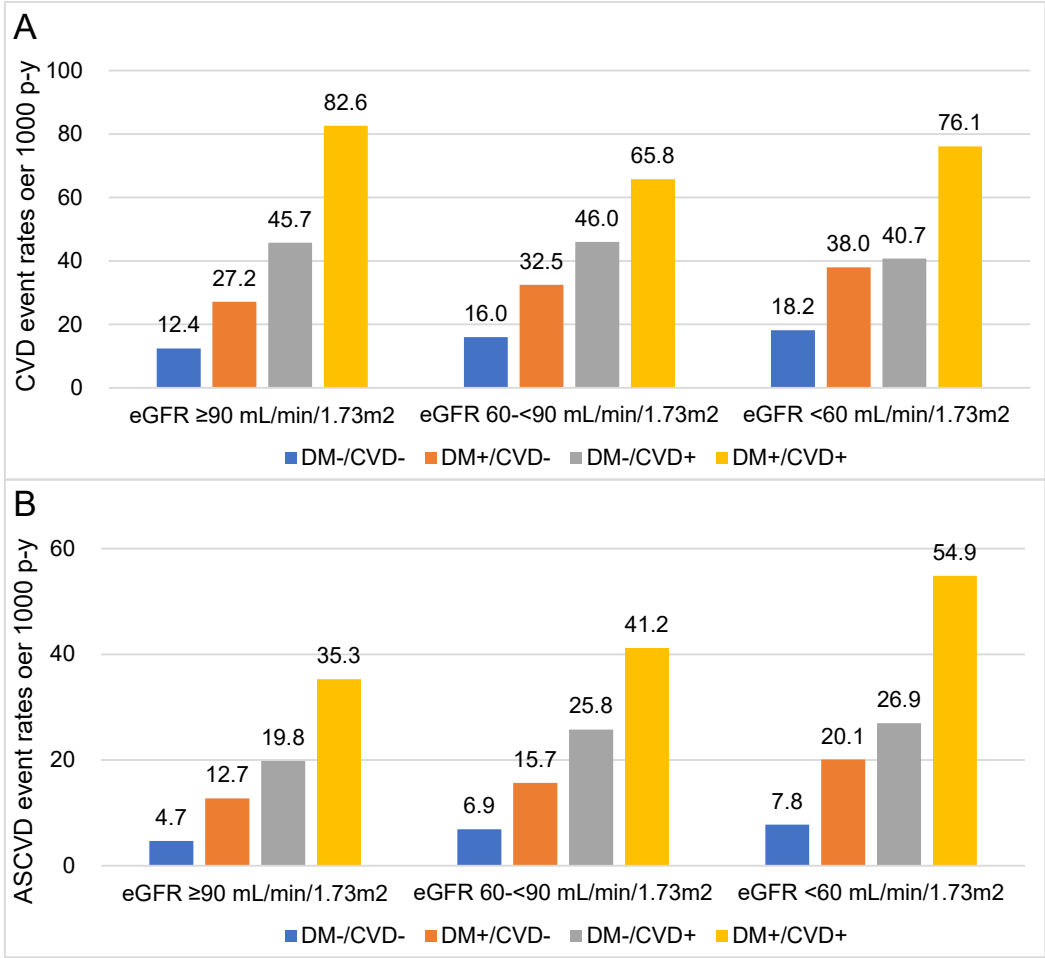
Supplementary Figure 7. Event rates by DM/CVD and triglyceride groups. (A) CVD events; (B) ASCVD events



Supplementary Figure 8. Event rates by DM/CVD and hs-CRP groups. (A) CVD events;
(B) ASCVD events



Supplementary Figure 9. Event rates by DM/CVD and CKD groups. (A) CVD events;
(B) ASCVD events



Supplementary Figure 10. Hazard ratios of DM+/CVD- vs. DM-/CVD+ for CVD events in each age, sex and race categories

